A Message from ASABE President
Maury Salz

Welcome to the 2019 Annual International Meeting (AIM) of the American Society of Agricultural and Biological Engineers in Boston, Massachusetts. I extend a special welcome to first time participants, international attendees and pre-professionals. I am confident you will find the meeting a welcoming and stimulating investment of your time.

AIM offers a wide array of opportunities for you to gain knowledge in technical sessions, make new or catch-up with old friends at social events, contribute to the ongoing growth efforts in technical communities, and to celebrate the accomplishments of peers in the awards ceremonies. I highly encourage you to engage in the opening keynote session by GreenBiz’s Joel Makower and the following panel discussion on sustainability and the need for a national strategy, which could alter how we live. We as individuals, and collectively as ASABE, will be challenged to think about how this broader vision of sustainability could fundamentally change our lives and the profession.

I want to thank our friends at Cornell University for serving as local hosts and the volunteer coordinators. Students work as volunteers to enhance the experience for all meeting participants and you can locate them by their blue shirts. Please thank them when you have the chance.

Boston is rich in history and be sure to take some time to experience what this unique area has to offer. I also encourage you to participate actively in AIM and reflect on how you can advance the Society goals to benefit yourself personally and the people of the world. Enjoy your Boston AIM.

Maury V. Salz
ASABE President, 2018-2019
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MEETING LOCATION
Boston Marriott Copley Place
110 Huntington Ave
Boston, Massachusetts 02116
1-617-236-5800

ASABE REGISTRATION DESK
The ASABE Annual International Meeting registration desk is located on the 4th floor of the Marriott Copley Place near the escalators.

Registration and information desk hours:

<table>
<thead>
<tr>
<th>Day</th>
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<tr>
<td>Saturday, July 6</td>
<td>3:00pm – 5:00pm</td>
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<td>Sunday, July 7</td>
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<td>Monday, July 8</td>
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<td>Tuesday, July 9</td>
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<td>Wednesday, July 10</td>
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ON-SITE REGISTRATION
Admission to the Annual Meeting sessions and events is open to those who have registered, paid, and have been issued a badge for the meeting.

The registration fee covers attendance to technical sessions, the Sunday Welcome Reception, Monday General Session and Keynote Address, and the Wednesday Awards Luncheon. Other events have a registration fee requiring payment to attend the event.

NAME BADGES
Please wear your name badge at all times when you are attending functions within the hotel. This badge informs us that you are a registered conference attendee and it will allow you access into meetings, the exhibit hall, meal functions, and coffee breaks.

WHAT TO ATTEND
The schedule for the ASABE 2019 Annual International Meeting includes 140 concurrent oral sessions, some being invited, rap, and panel discussions. There are meetings being held by committees and their councils. Attendees are free to attend any of the posted committee meetings. There are no prequalification requirements.

All attendees are encouraged to attend the Sunday Welcome Reception, the Opening General Session and Keynote Speaker’s address on Monday morning, and the Awards Luncheon on Wednesday.

A meeting orientation session is scheduled on Sunday, July 7 at 11am at the Atrium on the 3rd floor for those unfamiliar with the ASABE AIM.

PROGRAM ESSENTIALS
The AIM Program is organized by day and time for events, followed by the technical sessions by session number and time.

Also available to attendees is the ASABE AIM Meeting App. This easy-to-use app will provide all of the information in the traditional printed program, but offers customizable calendars, search functions, networking options, and more in the palm of your hand. To access the app, be sure to log in with your email used for registration as your user name and your last name as your password. An email with instructions was sent with more details.

PARENTS WITH CHILDREN
Attendees of AIM that are here with small children may need a quiet place to go at any point during the busy day. Please feel free to use Massachusetts on the 5th Floor for such an occasion. This room is designed to allow you to have a close escape from all the activity of AIM to allow...
your child to rest. An adult must remain with a child at all times. This room will be available Monday and Tuesday 8:00am-6:00pm and Wednesday 7:00am-3:00pm. If you are in need of child care services, please check with the hotel for options, if they are available.

ACCESSIBILITY AND DIETARY NEEDS
If you have needs that you did not include on your registration form, we usually can provide special dietary meal requests if given advance notice. Each dietary request will be handled on a case-by-case basis. For accessibility assistance, we respectfully request as much advance notice as possible.

ELECTRONIC DEVICES
As a courtesy to your colleagues, please turn off or silence all electronic devices during the sessions, workshops, and plenary addresses.

PHOTOGRAPHS/VIDEO TAPING
Photographs and video taping or recording of presentations and slides is strictly prohibited. Persons failing to comply will be asked to leave the meeting room.

MEMBERSHIP BOOTH
Visit the ASABE Membership Booth to:
- Become a member!
- Pay your dues
- Sign up for the Order of the Engineer
- Purchase ASABE recognition items

*Discounted technical books, history books, and conference proceedings are available for sale at the membership booth.*

Located in Salon D on the 4th floor across from the ASABE Registration Desk.

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**ASABE Code of Conduct: Harassment & Safety Policy**

*Adopted 22 April 2016*

ASABE is dedicated to providing a safe, hospitable, and productive environment for everyone attending our events, regardless of ethnicity, religion, disability, physical appearance, gender, age, or sexual orientation. All participants, attendees, ASABE staff, and vendors shall be treated with respect and consideration, valuing a diversity of views and opinions, in a considerate, respectful, and collaborative manner. It is important to remember that a community where people feel uncomfortable or threatened is neither healthy nor productive. Accordingly, ASABE prohibits intimidating, threatening, or harassing conduct during our meetings and conferences.

This policy applies to speakers, staff, volunteers, guests, students, contractors, exhibitors, and attendees participating in the sessions, tours, social events, and other activities of ASABE. Participants violating these rules may be sanctioned or expelled from the meeting or conference, without warning or refund, at the discretion of ASABE leadership.

Harassment of ASABE participants will not be tolerated in any form. Harassment includes offensive gestures or verbal comments related to ethnicity, religion, disability, physical appearance, gender, age, or sexual orientation in public spaces, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, circulation of written or graphic material that denigrates or shows hostility or aversion, and unwelcome attention. Participants asked to stop any harassing behavior are expected to comply immediately and without retaliation.

If a participant or exhibitor engages in harassing behavior, ASABE leadership may take any action they deem appropriate, ranging from a simple warning to the offender to expulsion from this and future meetings and conferences. If you are being harassed, notice that someone else is being harassed, or have any other concerns, please do not hesitate to contact ASABE staff who can work with appropriate ASABE leadership to resolve the situation. Harassment and other code of conduct violations reduce the value of our event for everyone. Confidentiality will be honored to the highest extent permitted without compromising the rights of others.

ASABE staff will be happy to help participants contact convention center/hotel/venue security or local law enforcement, and otherwise assist those experiencing harassment, to enable them to feel safe for the duration of the meeting or conference. Anyone experiencing or witnessing behavior that constitutes an immediate or serious threat to public safety at our meetings and conferences in the convention center is advised to locate a house phone and ask for security. We value your attendance, and want to make your experience as productive and professionally stimulating as possible.
Opening General Session

Monday, July 8, 8:00am-9:30am
Location: Salons E-F

ASABE President Maury Salz welcomes each of you to the 2019 ASABE Annual International Meeting. Please join us at this time for a special awards presentation and the keynote speaker address. Awards presented are: ITSC Paper Award; Educational Aids Blue Ribbons; Outstanding Reviewers; Outstanding Associate Editors; Conference Recognitions; Superior Papers; and Standards Development.

Keynote Speaker—From Here to Sustainability

Joel Makower, Chairman and Executive Editor of GreenBiz Group, will be the Keynote Speaker for the 2019 AIM.

Nearly every company is assessing itself through the lens of sustainability. For a handful of leadership companies, it involves asking the question: “How do we compete in a world in which energy, water, materials, carbon and toxicity are constraints to growth?” Today, sustainability is not just about “doing less bad” or “greening the bottom line.” It’s about reducing risk—supply chain, reputation, financial, and more. It’s about growing the top line through innovation, new markets, increased productivity and increased ability to attract and retain talent. And, increasingly, it’s about being regenerative and more resilient in a world facing resource constraints and climate challenges.

Special Panel Discussion on Sustainability

9:30am-11:00am
Location: Salons E-F

Following GreenBiz’s Joel Makower’s keynote talk at the ASABE AIM meeting in Boston, a panel will discuss the implications of sustainability on the agricultural and biological engineering profession. Makower’s definition of “sustainability” encompasses a broad range of economic, security (food, water, and defense), social, and environmental concerns for rural and urban areas globally. The panel will highlight Makower’s key messages that American businesses must take the lead in a bold new direction; one in which a) walkable communities, b) regenerative agriculture, and c) resource productivity form the core. Makower presents an actionable strategy for America to enable sustainable prosperity, security, and global leadership. We as individuals and as ASABE members will be challenged to think about how this broader vision of sustainability within a national strategy could fundamentally change our profession. The panel will provide an opportunity to reflect on this vision and elaborate on what it means to ASABE. Panelists include perspectives from within our society, from industry, and from outside the profession highlighting the complexity of sustainable systems and the need for convergent approaches to understand and manage this complexity.

Panelists include JoAnn Lighty (Dean of Engineering at Boise State University and former NSF founding co-leader of INFEWS), John Reid (Director, Product Technology and Innovation, John Deere), Rabi Mohtar (Dean of the Faculty of Agricultural and Food Sciences, American University of Beirut, Lebanon; TEES Research Professor, Texas A&M University; and an expert in the area of water resources and transdisciplinary research), and Amy Stein (Professor of Law at the University of Florida and nationally recognized for her research on energy policy and its implications on the energy and water nexus). Norm Scott, panel moderator, and a former Director of Cornell University Agricultural Experiment Station and Vice President of Research and Advanced Studies at Cornell, has been active in research on sustainable communities for over 20 years.
EVENTS, CPDS, AND TOURS

E#1 YPC Social Outing
Saturday, July 6, 7:00pm-9:00pm; pre-registration required
What better way to kick off AIM than with the Young Professional Community’s Social? Come join us for dinner, games, and socializing at Game on Fenway in downtown Boston. There is plenty to do at this fun place next door to Fenway Park! The social begins at 7pm. Meet at the ASABE registration desk and we will make the 20-minute walk together! All undergraduate, graduate students, and members under 35 years old are invited to this event. Food and drink are available for purchase.

E#2 YPC 5K Run/1Mile Walk
Sunday, July 7, 7:00am-9:00am; pre-registration required
Cost: $20
Join us for a beautiful 5k run or 1mile walk through historic Boston. The route will leave the Marriott Copley Place. We will meet at the registration desk at 7 am to walk to the starting area. The running/walking will start at 7:30am. Every participant will receive a piece of ASABE/YPC swag. We look forward to you joining us for fun and fitness. This event is sponsored by YPC.

E#3 Gale Holloway Memorial Golf Outing to Support the ASABE Foundation
Sunday, July 7, 7:15am-1:00pm    Cost: $120
Join us for a relaxed golf outing at William J. Devine Golf Course at Franklin Park and help support the efforts of the ASABE Foundation to promote our society. All levels of golfers are welcome—this will be a four-person scramble format (all play from the best shot). Green fee, cart, and lunch included in price. Additional fees for club rental.

CPD#1 Agricultural and Biological Professional Engineering Exam Development Session
Sunday, July 7, 8:00am-4:00pm
Location: Simmons     Cost: NC
Instructor(s): Naomi Bernstein
Sponsored by: EOPD-414
Difficulty Level: Entry Level
Description: For Engineers currently holding their PE License. Session will be used to develop and review the Ag and Biological Professional Exam Materials for future examinees. Proof of License will be required upon entry. Attendees do not need to be present for entire time slot. Please reserve at least 2 hours of your day between 8am-4pm for attending this session.

Target Audience: Professional Engineers
Benefits: PDHs for amount of time attended

CPD#2 Active Learning Techniques in Agriculture and Biological Engineering Courses
Sunday, July 7, 9:00am-12:00pm
Location: Vineyard     Cost: $45
Instructor(s): Ganesh C. Bora
Sponsored by: EOPD 203
Difficulty Level: Entry Level
Description: Emphasis has been given on active learning techniques (ALT) and instructors have strategically used ALT to promote student engagement all across subject areas. Previous implementations of general no-cost ALT in an Agricultural Engineering course showed encouraging results. The 30 seconds peer discussion, class work solving problems, videos have made the students enthusiastic to participate in the class discussion.
Target Audience: New Faculty, Post-Docs, PhD students, Teaching Assistants
Learning Objectives: Effective teaching with limited resources in Agricultural and Biological Engineering.
Benefits: Innovations in teaching with available resources and engage students in learning.

CPD#3 Hyperspectral Imaging and Data Analysis for Agricultural and Biological Engineers
Sunday, July 7, 8:00am-6:00pm
Location: Orleans   Cost: $155 (includes class, lunch, and round-trip train fare to MIT)
Instructor(s): Dr. Seung-Chul Yoon and Dr. Kurt C. Lawrence, USDA-ARS U.S. National Poultry Research Center, Athens, Georgia
Sponsored by: ITSC-348, ANGASABE
Difficulty Level: Entry Level/Intermediate
8:00 am-12:00 pm, class at the Marriott Copley Place
12:00pm-12:45, lunch break (reservations made at Champions Grill, Marriott)
12:45pm-3:15pm, class continuation
3:15pm-3:45pm, travel on train to MIT
3:45pm-5:30pm, MIT lab tours
5:30pm-6:00pm, travel back to train station and Copley Place
Description: Globally, image-based sensing techniques are increasingly becoming prominent and available to agricultural and biological engineers. Among these are the applica-
tions of multispectral and hyperspectral imaging for non-de-
structive comprehensive measurements of internal and ex-
eternal properties of things. Participants should expect to
leave with an understanding of the fundamental principles
of operation and data processing as well as explore applica-
tions. The workshop will round off with a visit with research-
ers at MIT who have developed novel low-cost spectroscopy
and imaging instrumentation and a tour of MIT.nano.

Target Audience: Engineers, scientists, and graduate stu-
dents who are interested in hyperspectral imaging and
data analysis for applied research. The course is designed
for researchers from beginning to intermediate knowledge
of hyperspectral data analysis.

Learning Objectives: The course will be divided into three
parts. The first part will cover a brief overview of hyper-
spectral and multispectral imaging including improved data
capture, calibration, lighting, and visualization. The second
part will cover intermediate topics of hyperspectral data
exploration and multivariate image analysis. Emphasis will
be placed on assessment of the hyperspectral data, export-
ing data to common chemometrics software for model de-
velopment, model prediction, and validation with hyper-
spectral image data. Finally, the third part will explore a
couple of case studies for real-world problem solving with
hyperspectral imaging technology.

Benefits: Many multispectral and most hyperspectral imag-
ing systems are still sold “as-is”. That is, the hardware of
the system is usually assembled and packaged with only
some form of data acquisition software and limited data
analysis. This course is intended to introduce multi- and
hyperspectral image analysis to the audience and help
them understand the basics of quality data collection, ex-
porting data to popular chemometric packages, and finally
evaluation/validation of models back on the hyperspectral
imaging technology.

ASABE Board of Trustees & Councils
Sunday, July 7, 10:30am-3:30pm
10:30am-1:30pm (Regis) Meeting of ASABE Board of
Trustees led by Maury Salz, president.
1:30pm-3:30pm (MIT) Membership Council
( Harvard) Meetings Council
( Brandeis) Standards Council
( Northeastern) Publications Council

AIM Orientation—What You Didn’t Know About
ASABE
Sunday, July 7, 11:00am-11:30am Location: 3rd floor Atrium
Join YPC/Ipc for an orientation on the Annual International
Meeting. What should you do, who should you talk to, and
what should you take away from the meeting? Also, take
this opportunity to learn about the Young Professional
Community and International Preprofessional Community.

This is a great event for the first time attendee! If you
aren’t able to attend, stop by the YPC Booth for a
pamphlet with all the information!

T#1 Boston Trolley Tour
Sunday, July 7, 1:00pm-3:00pm Cost: $55 per person,
includes round trip from hotel, private professional guide
Enjoy an exclusive, private trolley tour of Boston. From the
Boston Common into the Back Bay and over to Beacon Hill,
learn about these historic and affluent neighborhoods in
Boston. Visit Copley Square, dominated by two of the city’s
architectural feats, and see the John Hancock Tower and
Trinity Church. Following this famed square, the tour will
continue to the North End of Boston. On the way, you will
see Old South Meeting House where the Revolutionary
War began. Conclude the tour by hearing the story
associated with the Old North Church where Paul Revere
famously hung two lanterns in the steeple indicating the
British were invading by sea!

CPD#4 Data Analytics using Python in
Agricultural and Biological Engineering
Sunday, July 7, 1:00pm-4:00pm
Location: Vineyard Cost: $10
Instructor(s): Gurdeep Singh, Sushant Mehan
Sponsored by: YPC
Difficulty Level: Entry Level
Description: Data science is a useful discipline to develop
and improve existing information from data in various
forms, either structured or unstructured. Python, a high-
level computer language, has gradually become a more
popular choice within the data science field and is user-
friendly. This workshop will highlight the basics of data
science with python, including data mining and data
cleaning, how to best interpret and visualize of agricultural
and biological engineering data, as well as some high-level
machine learning/deep learning packages.

Target Audience: University students, researchers, and
other professionals interested in using data science for
generating insights.

Learning Objectives: (a) Applying Python to clean and
understand raw data (b) Understanding how to relate
different variables within data and developing simplistic
model using python and its advanced application.

Benefits: Becoming familiar with one of most highly
accepted language in data science and its use to
understand your data analytically and visually.

CPD#5 Teaching Online: Course Design, Delivery
and Learning Analytics
Sunday, July 7, 1:00pm-4:00pm
Location: Yarmouth Cost: $45
Instructor(s): Patrizia Busato, Remigio Berruto, Fedro
Zazueta
Sponsored by: EOPD
Difficulty Level: Entry Level
Target Audience: Individuals with teaching and extension education responsibilities including, faculty, lecturers and teaching assistants interested in acquiring knowledge and skills on for online teaching, active learning, flipped classroom instruction and learning analytics. “Real world” experience will be shared by the workshop conductors.
Learning Objectives: Describe principles of good instructional design; Describe active learning principles and flipped classroom pedagogy; Identify required resources and skills required for successful delivery of online and flipped classroom courses; Acquire foundational skills to develop online and face-to-face materials for flipped classroom delivery; Lessons learned in the application of the flipped classroom pedagogy; Apply learning analytics to improve student success
Benefits: Implementing active learning pedagogies in engineering education has been shown to improve learning outcomes and higher levels of student satisfaction and success.

ABET Outcomes Assessment and Criterion Updates
Sunday, July 7, 1:30pm-3:30pm Location: Nantucket
This session will cover the transition from former ABET student outcomes to the newer student outcomes with group discussion about assessment practices. Additional discussion will focus on new updates from ABET and visit process best practices.

Fountain Wars Oral Presentations
Sunday, July 7, 2:30pm-4:30pm Location: Falmouth
Are you interested in the preparation and creative behind-the-scenes efforts of the different Fountain Wars teams? Come to the oral presentation phase of the competition and get a heads-up on what will be displayed at the building-testing phase on Monday at 1:00pm. Details page 14.

Leadership in ASABE, What You Need to Know to be Effective
Sunday, July 7, 3:00pm-4:30pm Location: Suffolk
Too often committee members are asked to take on a leadership role without the right tools and without knowing the specific expectations and structure they are to work within. This session will help break down the confusion and provide some foundational information as well as provide a forum for general and specific questions committee officers are confronted with as well as practical solutions.

Alpha Epsilon Annual Meeting
Sunday, July 7, 4:00pm-5:30pm Location: Nantucket
Alpha Epsilon will be having their annual meeting again!

Each chapter is encouraged to have at least one member attend. We will have door prizes!

ASABE Welcome Reception
Sunday, July 7, 4:30pm-6:00pm Location: Gloucester
All meeting registrants are invited to attend the welcome reception. This is a great event to network and make plans for dinner later on. The Boston Visitors Bureau will be available to offer advice and assist you in making your dining reservations.

E#4 Women in ASABE Speed Networking
Sunday, July 7, 6:30pm-7:30pm Location: Simmons
Would you like to visit with other women who participate in the annual meeting and perhaps share some of your same interests? This is the opportunity for you! Participants are divided into mentors and mentees. When the cowbell rings, mentees move to another table to meet other women while the mentors stay at a table to host and encourage conversation. The hour allows enough time to sit at 5-6 tables; arrive on time to maximize the benefit. Information on the mentors will be provided in advance so mentees can select tables based on brief mentor biographies.

E#5 Alumni Reception of College of Biosystems Engineering and Food Science, Zhejiang University
Sunday, July 7, 6:30pm-10:00pm Location: off-site
Cost: $0 alumni/$30.00 guests
Alumni and visiting professors of College of Biosystems Engineering and Food Science, Zhejiang University are invited to enjoy a reception at a local restaurant and catch up with old friends. Please send email to xwang2@illinois.edu by July 1st if you plan to attend.

E#6 Industry-Focused Speed Networking Session
Sunday, July 7, 7:30pm-8:30pm Location: Simmons
This session is designed for people who want to connect with those working in industry who are further along in their career. Perhaps you are a mid-career person thinking about moving into management and want some advice. Or maybe you’re fairly new to industry and want to talk to someone with more experience. Are you a student interested in working in industry after graduation? This is the opportunity for you! Participants register as either mentors or mentees. Brief mentor biographies will be provided so mentees can select tables in advance. Every 10 minutes mentees move from table to table to meet with industry mentees while mentors stay at the tables to host and encourage conversation. This hour-long session allows enough time to sit at 7-9 tables to gain insight from multiple perspectives. Note: the intent of this session is for career advice, and is NOT a career fair. Mentors will be selected to represent a diverse set of industries.
E#7 Prayer Breakfast  
Monday, July 8, 6:30am-8:00am  Cost: $20  
Location: Simmons  
The Fellowship of Christian Agricultural and Biological Engineers invites all meeting registrants, spouses and guests to the interdenominational prayer breakfast. The continental breakfast will begin promptly at 6:30AM and conclude at 8:00AM. Pre-registration is required.

E#8 Guide to Professional Licensure  
Monday, July 8, 7:00am-8:00am; pre-registration required  
Location: Boylston  
Studying for a Professional Licensure Exam? Or just have questions about which Professional Licensure Exam is right for you? Come join us to ask our panel of experts questions and get answers on questions like: why take a licensure exam?, which exam is right for you?, what is covered on a licensure exam?, and how can ASABE help you prepare for the exam?

E#9 Meet and Greet Breakfast with Department Chairs and Senior Faculty  
Monday, July 8, 7:00am-8:00am  Location: Regis  
Cost: $15.00 faculty/$10.00 students  
This networking event is meant to connect late-career graduate students with department chairs/heads as well as senior faculty members to discuss opportunities for future research and/or faculty position openings. This is a YPC sponsored event, open to all graduate students as well as interested faculty members.

E#10 Cornell Friends, Family and Alumni Breakfast  
Monday, July 8, 7:30am-8:30am  Location: Vineyard  
Cost: $25  
An informal gathering of Cornell friends, family and alumni over coffee and breakfast. Alumni and past associates are encouraged to attend.

Opening General Session  
Monday, July 8, 8:00am-9:30am  Location: Salons E-F  
Please see details on page 4.

Special Panel Discussion on Sustainability  
Monday, July 8, 9:30am-11:00am  Location: Salons E-F  
Please see details on page 4.

Robotics Student Design Competition  
Monday, July 8, 9:00am-6:00pm  Competition testing  
11:30am-1:30pm Poster Session  
Tuesday, July 9, 8:00am-6:15pm, Competition  
Location: Fairfield/Exeter/Dartmouth  
Teams design a robot that will conduct autonomous inventory management and selective fertilizer application in a plant nursery. Robots need to identify simulated plants and move them to a storage area. Details on page 15.

Career Fair  
Monday, July 8, 9:30am-12:00pm  Location: Salon G  
The Career Fair is just one of the many highlights of the ASABE Annual International Meeting. It is an outstanding networking opportunity that allows interested individuals to connect with the Fortune 500 companies, agricultural and bio-based businesses, bio-research companies and major land grant universities looking for qualified candidates. The ASABE Career Fair provides an opportunity for employee and potential employees to come together informally and share information. Academia will also be represented with opportunities at the masters and doctoral level. Employers register their job positions at the registration desk and receive an interview table number. These openings are posted with the table number located near the ASABE registration desk for review. Prospective employees are invited to seek out employers of interest and exchange information.

T#2 Growing in the City: A Tour of Freight Farms, Hydroponic, Container Farm  
Monday, July 8, Tour #1: 10:30am-12:30pm  
Tour #2: 11:30am-1:30pm  
Cost: $43 per person, includes round-trip transportation from hotel, tax, gratuities, all arrangements  
Boston-based Freight Farms is the leader in the containerized agriculture industry. With its flagship product, The Leafy Green Machine™, the company was the first to integrate smart, hydroponic, vertical farming into an intermodal freight container. Its IoT-software farmhand™ is a farming data analytics platform that allows any hydroponic farmer to remotely optimize, automate, and manage their operations from a smartphone or desktop app. Take this opportunity to get a look inside the Freight Farms’ latest farm design to see how they’ve growing hundreds of pounds of fresh produce every week in just 320 square feet.

E#11 Spouse/Guest Lunch  
Monday, July 8, 10:00am-12:00pm  
Cost: Included with Spouse/Guest Registration. Additional tickets $75.00. Includes transportation, your meal at the Hampshire House, tax, and gratuities  
The Hampshire House is a turn-of-the-century mansion on historic Beacon Hill where generations of Bostonians and their guests have wined, dined, and danced the night away. It is also where friends will gather for the annual Spouse-Guest Brunch during the 2019 ASABE AIM. This five story Georgian revival townhouse is lavished with Italian marble, carved oak paneling, crystal chandeliers and tall Palladian windows. Those windows not only look out onto the Victorian elegance of the Boston Public Garden, but they also gained a vision of Boston’s elite social world.
as 84 Beacon Street became one of the most fashionable salons in the city. Gentlemen in top hats and tails and ladies in silk and satin ascended the grand staircase to the heart of the house for gala evenings in the Ballroom and Library. It is now a restaurant, used for special occasions, and continues as the face of the old TV series *Cheers!*, where the original bar from the TV set still welcomes people to enjoy good times.

**T#3 Street Lamps & Cobble Stones**

Monday, July 8, 12:15pm-2:30pm
Cost: $37 per person includes professional guide and bus transportation back to the hotel

Following the spouse/guest lunch, a tour guide will lead you by foot into Beacon Hill. From the golden dome of the State House to the elegant homes of Louisburg Square, you will enjoy picturesque streets that highlight examples of Early-American architecture with particular emphasis on the work of Charles Bulfinch. Explore Boston’s most photographed street as your guide takes you on a journey of Beacon Hill’s ornate past, from its rural beginnings to the vision of the Mount Vernon Proprietors. Walk among this historic collection of Federal and Greek Revival row houses and hear the fascinating stories of Boston’s prominent citizens who have called Beacon Hill their home. Note: Wear comfortable shoes as this is a walking tour done at a leisurely pace.

**T#4 Boston Public Garden and Boston Common**

Monday, July 8, 12:15pm-2:30pm
Cost: $32 per person includes professional guide

Another option after brunch at the Hampshire House, is to have a guided tour of the beautiful Boston attractions: the Boston Public Garden and the Boston Common located directly across the street. You will be greeted by your guide to walk through the first public botanical garden in the United States. Be regaled with stories from Boston’s history. The landscaped 24-acre Boston Public Garden and Boston Common were established in 1837 during the populating of the Back Bay section of the city. It was the first part of the swamp that was filled in to create this iconic neighborhood. The Public Garden contains lovely manicured paths, the famous “Make Way for Ducklings” statues, a 4-acre pond with swans, a variety of other birds, and several memorable statues throughout. At the end of the tour, you will have the option to explore the famous shops along Newbury Street on your own, or return to the hotel. Note: Wear comfortable shoes as this is a walking tour done at a leisurely pace.

**NRES Community Update**

Monday, July 8, 12:00pm-1:00pm  Location: Salon I
Following Session 116 Natural Resources & Environmental Systems Distinguished Lecture Series, and 117 ABE Curriculum and Industry Needs in Ecological/Water Resources Engineering.

**Boyd-Scott Graduate Research Award**

Monday, July 8, 12:00pm-2:30pm  Location: Hyannis

The Graduate Student Research Award (GSRA) Competition sets out to recognize excellence in the conduct and presentation of agricultural and biological engineering research carried out by graduate student members. The competition is held in two parts: a written competition and an oral presentation for the top three finalists in the M.S. and Ph.D. categories, which is held at the ASABE Annual International Meeting. Winners will be recognized at the AEM/ASABE Student Awards Breakfast on Wednesday.

**T#5 YPC Local Agriculture Tour of the Boston Public Market**

Monday, July 8, 12:30pm-4:00pm
Cost: $37 per person includes round-trip from hotel, tax, gratuities, all arrangements

Join the YPC for a tour of the Boston Public Market, an indoor, year-round marketplace where you can find seasonal and locally sourced food from Massachusetts and New England. You will see fresh produce, meats, poultry, eggs, dairy, seafood, baked goods, and specialty items.

**Fountain Wars**

Monday, July 8, 1:00pm-5:00pm, Team check-in and build 5:00pm-8:00pm, Team test/adjustment and competition Location: TBA; check the meeting app (Oral presentations are Sunday, 2:30pm.) Teams will construct their systems with PVC pipe, couplers, fittings, valves, nozzles, and pumps during a construction period, followed by the competition. Details on page 14.

**Past Presidents Roundtable**

Monday, July 8, 2:30pm-4:30pm
Location: New Hampshire

The past presidents of ASABE gather to catch up on Society activities and give feedback on the course our Society has set for the future. This event is open to all past presidents and their guests.

**Order of the Engineer Induction Ceremony**

Monday, July 8, 4:00pm-5:00pm  Location: Simmons

Engineering graduates and registered engineers are invited to accept the Obligation of the Engineer and a stainless steel ring which is worn on the little finger of the engineer’s working hand. All graduates of ABET accredited engineering programs; seniors in ABET accredited programs within two academic years of graduation; licensed PEs; and members of the Canadian Calling by reciprocity are invited to join the Order. All inductees must be present to accept their certificate and ring at the induction ceremony. The cost of entering the Order is $15.00 and inductees may register with Tina Schultz at
schultz@asabe.org before the meeting or in person at the membership booth at the meeting. Learn more about the Order at http://www.order-of-the-engineer.org/.

**E#12 Women in ASABE Social**
Monday, July 8, 4:30pm-5:30pm  
Location: Regis

The Women in ASABE Social is an informal mixer open to all female ASABE members. Hosted by Amy Kaleita-Forbes and Michelle Soupir, this event will provide a unique opportunity to meet, socialize and network with other women from across ASABE. Refreshments will be served. Registration is required but there is no charge for this event.

**E#13 Association of Overseas Chinese Agricultural, Biological, and Food Engineers (AOCABFE) Annual Business Meeting And Award Banquet**
Monday, July 8, 5:00pm-7:00pm  
Location: MIT  
Cost: $65.00 member

The AOCABFE annual meeting provides a platform for promoting and facilitating research and educational exchanges among researchers with Chinese origin or associations in the areas of agricultural, biological and food engineering. The ASABE meeting attendees with international collaboration interests are invited to attend the meeting as well. The AOCABFE activities in 2018-2019 will be reviewed and plans of action for 2019-2020 will be discussed. Following the business meeting the members of AOCABFE will be gathering at an off-site location for the awards dinner and an opportunity for socializing and networking. Recognition and awards will be presented at the banquet.

**E#14 Association of Agricultural Food and Biological Engineers of Indian Origin (AABFEIO) Business Meeting and Dinner**
Monday, July 8, 5:30pm-6:30pm  
Location: Salon H  
Cost: $30 member/$20 student/$35 non-member

The 2019 Annual Business Meeting of AABFEIO will be held from 5:30PM to 6:30PM on Monday, July 8 at the ASABE conference venue. Following the meeting, the association will have its annual dinner from 7:00pm to 9:30pm. Dinner location will be announced.

**Fellows Induction Ceremony/Reception**
Monday, July 8, 6:00pm-8:00pm  
Location: Salons E-F

All registrants are invited to this special recognition ceremony and reception honoring the 2019 ASABE Fellows. ASABE defines a Fellow as a member of unusual professional distinction, with outstanding and extraordinary qualifications and experience in, or related to, the field of agricultural, food, or biological systems engineering.

**E#15 Graduate Student Social**
Monday, July 8, 7:30pm-9:30pm; pre-registration required.  
Location: St. Botolph

This event will provide an informal setting for graduate students from all over the world to meet up, socialize and make connections with each other. It’s a great chance to get to know the people you’ll be seeing in the hallways, sessions, and events throughout the week! This is a YPC sponsored event, open to all graduate students.

**Iowa State University ABE Reception**
Monday, July 8, 8:00pm-9:30pm  
Location: Provincetown

Meet your old friends and make new ones. Find out what is happening in the Department of Agricultural & Biosystems Engineering at Iowa State University.

**BSE—Virginia Tech**
Monday, July 8, 8:00pm-10:00pm  
Location: Regis

The Biological Systems Engineering Department at Virginia Tech cordially invites alumni and friends to this gathering on Monday evening. Come enjoy some refreshments and catch up on the happenings in the department and at Virginia Tech!

**Texas A&M Former Students and Friends Social**
Monday, July 8, 8:00pm-10:00pm  
Location: Vineyard

The Biological and Agricultural Engineering Department invites you to join us in a reception for all Aggies and their supporters. We will meet at 8:00 pm for complimentary appetizers and a cash bar. Gather with us to enjoy an update on the department!

**E#16 University of Illinois Alumni & Friends Reception**
Monday, July 8, 8:00pm-10:00pm; pre-registration required.  
Location: Simmons

Alumni and friends of the University of Illinois are invited to attend. We will feature a hosted bar and snacks. There is no fee for the event, but registration is appreciated. Please stop by to visit and hear what is new with the Orange and Blue I-L-L-I-N-I!

**E#17 International Breakfast**
Tuesday, July 9, 7:00am-8:00am  
Cost: $20  
Location: Tremont

The International Breakfast is a great opportunity to interact with peers from many different countries. If you are coming from abroad or have an interest in international issues this is the place to meet new people and begin long and fruitful working relationships. The speaker for this International Breakfast will be the 2019 recipient of ASABE’s prestigious Kishida Award.

**E#18 Purdue Alumni & Friends Breakfast**
Tuesday, July 9, 7:00am-8:00am  
Location: Simmons  
Cost: $5; preregistration required.

Purdue University’s Dean of Agriculture, the Agricultural & Biological Engineering Department, and the Engineering Alumni Association invite all alumni and friends to their breakfast.
E#19 ITSC-230 Biosensors Networking Breakfast
Tuesday, July 9, 7:00am-8:00am  Cost: $20
Location: Regis
Join us for breakfast to network with many biosensor experts and students. In this casual setting, let’s share and celebrate our professional success, discuss our interests and boost our collaborative efforts.

E#20 Penn State Alumni and Friends Breakfast
Tuesday, July 9, 7:00am-8:30am  Cost: $15
Location: Vineyard
This event is open to all alumni, student, current employees and friends of The Pennsylvania State University, sponsored by the Penn State Department of Agricultural and Biological Engineering. Come join us for the opportunity to meet old friends, faculty, students and to get updated on the current happenings in the ABE Department. All guests are eligible to win door prizes.

Local Production Agriculture 101
Tuesday, July 9, 7:30am-9:00am  Location: Salon J
During your visit to Boston, here is an opportunity to learn about some of the prominent agricultural industries in Massachusetts and the northeastern United States! Cranberries are one of the five top agricultural products in the state of Massachusetts, while wood and paper products are among the top ten exports from the Port of Boston. Two speakers from the UMass Center for Agriculture, Food, and the Environment will be introducing their respective research facilities and sharing facts and information about regional cranberry and timber production. This session is organized and sponsored by the YPC.

Robotics Student Design Competition
Monday, July 8, 9:00am-6:00pm  Competition testing
11:30am-1:30pm Poster Session
Tuesday, July 9, 8:00am-6:15pm, Competition
Location: Fairfield/Exeter/Dartmouth
Teams design a robot that will conduct autonomous inventory management and selective fertilizer application in a plant nursery. Robots need to identify simulated plants and move them to a storage area. Details on page 15.

PRS Community Meeting
Tuesday, July 9, 8:00am-9:00am  Location: Salon I
Stay after the meeting for invited session 221 Building Successful Collaborations to Address Challenges in Food and Bioprocess Engineering.

K.K. Barnes Student Paper Competition
Tuesday, July 9, 8:00am-9:00am  Location: St. Botolph
The KK Barnes Student Paper Award Competition comprises of an undergraduate student paper competition and an oral competition, which is held at the ASABE Annual International meeting. Winners will be recognized at the AEM/ASABE Student Awards Breakfast on Wednesday.

Gunlogson Open
Tuesday, July 9, 9:30am-10:30am  Location: St. Botolph
The Gunlogson Environmental Design Student Competition comprises of a written design report and an oral competition, which is held at the ASABE Annual International Meeting. Winners will be recognized at the AEM/ASABE Student Awards Breakfast on Wednesday.

AGCO National Student Design Competition
Tuesday, July 9, 11:00am-12:00pm  Location: St. Botolph
The top three entries for the student design competition have been invited to this oral competition. Listen to these outstanding engineering design project presentations. Winners will be recognized at the AEM/ASABE Student Awards Breakfast on Wednesday.

E#21 Graduate Student Professional Development Roundtable
Tuesday, July 9, 12:00pm-2:00pm  Location: Simmons
Cost: $15
An invited panel of esteemed members of our society will share their academic and professional experiences with current graduate students. This is not a technical session but instead a time to ask questions and gain advice from others who have been there before you. This is a YPC sponsored event, open to all graduate students.

Ethics in Engineering Essay and Video Presentation (P-128)
Tuesday, July 9, 12:15pm-2:15pm  Location: Columbus II
Sponsoring Committee is P-128: Engineering Ethics Competition. Video contest: Three winners will be selected to receive prize money of $500, $300, and $200 for 1st through 3rd placements. Each invited team will receive one complimentary meeting registration. Essay contest: The top three placements will earn cash awards as follows: $500 for 1st; $300 for 2nd; and $200 for 3rd. Each invited competitor will receive one complimentary meeting registration as well.

Quarter Scale Tractor Student Design Competition
Tuesday, July 9, 12:30pm-2:30pm  Location: St. Botolph
Top finishing teams in the Team Presentation category from this year’s competition will give their winning presentations during this session. This is an excellent opportunity for students to see what a top presentation looks like and use that knowledge to improve their own presentation in future years. There will be ample time for Q&A, so come ready to learn.

Grad School 101: A Panel Discussion
Tuesday, July 9, 2:00pm-4:00pm  Location: Columbus I
Thinking about graduate school? Wondering what it’s all about or if it’s the right place for you? A panel of current
graduate students from different backgrounds, programs, and experiences will share their journey as well as answer questions on everything from the application process to everyday grad life. This is a YPC sponsored event, open to anyone interested or thinking about graduate school.

**ASABE Foundation Board of Trustees**
Tuesday, July 9, 2:00pm-5:00pm  Location: Regis  The ASABE Foundation Board of Trustees meeting is led by Lalit Verma, Foundation president.

**YPC Graduate Student Involvement Committee Meeting**
Tuesday, July 9, 4:00pm-5:00pm  Location: Boylston  Have ideas, thoughts, or concerns about AIM’s event’s for graduate students? Looking to get more involved with YPC and ASABE? We would love to have you! We will be discussing the committee’s purpose & goals, reviewing this year’s events as well as looking to what we would like to have at the 2019 AIM. This is a YPC sponsored event, open to all grad students.

**African Network Group of the ASABE Annual Business Meeting**
Tuesday, July 9, 5:30pm-7:30pm  Location: Salon J  Annual business meeting to receive and evaluate feedback on past year’s milestones and set new goals in alignment

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Maury V. Salz  
ASABE President  
President, CLAAS Omaha, Inc

Salz is president of CLAAS Omaha, Inc., manufacturer of LEXION combines and headers for North America, where he is responsible for General operations which includes research and development for CLAAS NA Platform. Salz has worked for CLAAS for 18 years, serving as president since 2007. He holds seven patents relating to tractor drive systems and cotton harvesting and combine harvesting products.

Salz grew up on a family farm in northwest Iowa and continues to participate with his family in corn and soybean farming operations. He received a B.S. in Agricultural Engineering from Iowa State University and an MBA from St. Ambrose University in Davenport, Iowa.

Currently a member of E-05/3 (Digital Strategy) and E-06 (Foundation Liaison), Salz has served on the Board of Trustees (2009-2011), liaising with the Standards Council during that time, and on P-125 (AEM Student Trophies Competition) from 2003 to 2015. His additional Society activities include inaugurating and leading the Values Growth ad hoc committee. Salz is a 20-year member of the Society.

"What a wonderful opportunity the presidency has been to meet people within our profession. The engagement of our engineers to improve other’s lives and our world’s environment is amazing and I’m deeply gratified to be associated with ASABE."

Sue E. Nokes, P.E.  
ASABE President-Elect  
Professor, Associate Dean for Faculty Affairs and Facilities, University of Kentucky

A University of Kentucky faculty member since 1995, Sue Nokes recently accepted the Associate Dean for Faculty Affairs and Facilities position in the College of Engineering at UK, after serving six years as chair of the biosystems and agricultural engineering department. Nokes’ teaching interests include process engineering and mathematical modeling of biological systems. Her research emphasis has been in bioprocess engineering, where Nokes has published more than 60 peer-reviewed articles and received over $12 million in grants. She holds one patent.

Named an ASABE Fellow in 2016, Nokes has been an ASABE member for over 30 years. She served on the Board of Trustees as treasurer from 2013 to 2017 and on the Finance committee from 2007 to 2017. She recently completed a term as chair of the E-20 Initiative Fund Evaluation subcommittee. Nokes has served on numerous other committees, including the Nominating committee twice (2010-2012 and 2001-2003). She received the Young Educator Award in 2000.

"My presidential focus will be to enable more interconnections within the society and with external partners. ASABE is a diverse group with a common mission – merging technology with biological systems to improve our planet’s wellness. Interconnections are essential to spark creativity and resource pooling, which enable significant progress towards achieving this noble mission, and make the journey much more rewarding."
with the Society’s objectives. Old and new members as well as interested parties are cordially welcome to contribute and network.

**E#22 Association of Korean Agricultural, Biological, and Food Engineers (AKABFE) Business Meeting**
Tuesday, July 9, 7:00pm-7:30pm  Location: Nantucket  Cost: $30
Annual business meeting sponsored by the Association of Korean Agricultural, Biological, and Food Engineers (AKABFE).

**E#23 ASABE Foundation Dinner**
Tuesday, July 9, 7:00pm-10:00pm  Location: Westin Coppley Place  Cost: $150
Plan to join us for a real Boston dining experience—from lobster to Boston cream pie! This year’s dinner will take place in the elegant Staffordshire Room in the Westin Coppley Place overlooking Copley Square, just a three-minute walk from the Marriott. After dinner we’ll enjoy a presentation by Chandra Madramootoo titled “How to Feed 9 Billion People in a Resource Constrained World.” Under current growth scenarios, the world’s population is expected to reach 9 billion by 2050, leading to increased energy, water, food and nutrition demands. Achieving these requirements through the untamed exploitation of non-renewable resources, will certainly contribute to increased atmospheric temperatures and greenhouse gas emissions, and food production systems will consequently face new stresses. This talk will illustrate some of the key priorities for the ASABE community to consider in shaping the global change agenda to address these significant threats to agriculture and the world’s food systems. Chandra Madramootoo, P.Eng., holds a James McGill Professorship in bioresource engineering at McGill University. He also holds visiting appointments in civil and environmental engineering, and in water and food security at the Massachusetts Institute of Technology (MIT). Come out, enjoy a delicious meal and lively presentation, and help us support the good work of the ASABE Foundation.

**E#24 AEM/ASABE Student Awards Breakfast**
Wednesday, July 10, 7:30am-9:00am  Location: Salons E-G  Cost: $5 students/$20 others
The Association of Equipment Manufacturers (AEM) and the American Society of Agricultural and Biological Engineers (ASABE) invites all of the ASABE student members to attend the AEM/ASABE Student Awards Breakfast. This event is a wonderful time to learn more about the professional side of the world as you dine. Reservations must be made by on or before Tuesday, July 9. Breakfast reservations will be confirmed in your ASABE registration packet. All annual meeting attendees are encouraged to attend.

**E#25 ASABE Awards Luncheon**
Wednesday, July 10, 12:30pm-2:30pm  Location: Salons E-G  Cost: A luncheon ticket is included with full meeting registration or with Wednesday only registration; additional tickets $70. A complete list of awards to be presented will be posted at a later date.

**E#26 344 Autonomous Field Equipment—The Future of Standardization**
Wednesday, July 10, 2:30pm-6:00pm  Location: Suffolk  Cost: $30/$10 students
Highly autonomous and autonomous agricultural equipment is our present and our future. Join the discussion as we review where we are, hear from experts in the field about work being done around the world and bring the focus back to where ASABE fits in the future of autonomy in agriculture. Panel members include Norbert Schlingmann, J. Alex Thomasson, Craig Baillie.

**T#7 Dams: Keeping Communities Safe**
Wednesday, July 10, 2:30pm-6:30pm  Cost: $60 per person includes round-trip transportation from hotel to all dam locations, snack, water, tax, gratuities, all arrangements
Tour four NRCS-566 flood water retarding dams in the SuAsCo Watershed in Worcester and Middlesex Counties in Massachusetts. The Nichols Dam completed dam rehabilitation in 2012, including a new ACB spillway and toe drains. Rawson Hill Dam will be rehabilitated for spillway integrity and overtopping by reconstructing the dam using RCC. Tyler Dam, which has a 39.5 square mile watershed with multiple flood control structures upstream, will be rehabilitated by increasing the auxiliary spillway efficiency and raising the dam. Delaney Complex Dam which has two impoundments, two principal spillways, one auxiliary spillway and one balancing channel will be rehabilitated for spillway integrity by changing the auxiliary spillway from a grassed line channel to labyrinth weir.

**ASABE Board of Trustees & Councils**
Thursday, July 11, 8:00am-3:00pm
8:00am-10:00am  (Vineyard)  Standards Council  (Orleans)  Membership Council  (Yarmouth)  Meetings Council  (Hyannis)  Publications Council
10:30am-3:00pm  (Wellesley)  ASABE Board of Trustees

**T#6 Nashoba Valley Winery/Brewery/Orchard**
Thursday, July 11, 9:00am-6:00pm  Cost: $65 per person includes round-trip transportation from hotel, tax, gratuities, all arrangements
This tour will avail ANGASABE members and other interested ASABE members and guests the opportunity to visit the Nashoba Valley Winery, Brewery and Orchard (Agritourism). It will provide opportunities for collaborations and exchange of knowledge among members and hosts.
The 2019 ASABE
Fountain Wars Competition

The competition is open for all to view.

Sunday, July 7
Location: Falmouth
2:30pm-4:30pm  Oral Presentations

Monday, July 8
Check the meeting app for location
1:00pm-5:00pm  Team Check-in and Build
5:00pm-8:00pm  Team Test/Adjustment and Competition

Fountain Wars is a hands-on, real-time design competition where students design and model their entry on-site at the Annual International Meeting, and build and test their actual entry under time pressure during the competition. It requires a modest design document and limited expenditures. As such, it is targeted at student clubs or participants in sophomore/junior-level class design projects. Teams will arrive at the competition with a design for their fountain, along with the necessary PVC pipe, couplers, fittings, valves, nozzles, and pumps to assemble their design. After making a brief, marketing-style promotion, they will construct their system during a 120-minute construction period. Awards are based on scores of the written report, oral presentation, construction, technical tasks and aesthetic display segments of the event.

Prizes Awarded
1st–$500, 2nd–$350, and 3rd–$200, plus seven specialty awards of $100 each
The 2019 ASABE Robotics Student Design Competition

The competition is open for all to view.

**Location: Fairfield/Exeter/Dartmouth**

**Monday, July 8**
- 11:30am-1:30pm: Poster Session
- 9:00am-6:00pm: Competition Testing
- 5:00pm-6:00pm: Judges Orientation
  *(Location: Vineyard)*

**Tuesday, July 9**
- 8:00am-10:00am: Competition Round 1
- 10:30am-12:30pm: Competition Round 2
- 2:00pm-4:00pm: Competition Round 3
- 5:30pm-6:15pm: Wrap-up Session

The 2019 competition will challenge teams to design a robot that will conduct autonomous inventory management and selective fertilizer application in a plant nursery. Both the advanced and beginner divisions will have a playing field that is 4 ft × 16 ft and can use only one robot to complete the challenge. There are 21 simulated plants on the board and robots need to identify them and move them to the storage area. One plant, called the Golden Plant, will be placed in the center of the board and will have extra points for the robot that collects it first.

**Prizes Awarded**

- **Beginner Division**
  - 1st–$500
  - 2nd–$350
  - 3rd–$200

- **Advanced Division**
  - 1st–$800
  - 2nd–$600
  - 3rd–$400
Coffee and tea are available in the Exhibit Hall on Monday and Tuesday 9:00am-11:00am and 2:00pm-4:00pm, and Wednesday 7:00am-9:30am.

101 Carbon Materials: Biochar-Hydrochar-Activated Carbons
Monday, July 8  9:30am-12:00pm
Location: Boston University
Sponsored by: ASE
Moderators: Kaushlendra Singh, Oluwatosin Oginni, West Virginia University, Morgantown, WV

9:35am  Removal of Phosphate from Aqueous Effluents Using Nitrogen Doped Chars  • Presenting author: Sohrab Haghighi Mood, Washington State University, Pullman, WA (Sohrab Haghighi Mood, Michael Ayalia, Manuel Garcia-Perez) 1900928

9:50am  A Laboratory Study on a Biochar-Augmented Biosand Filtering System for Escherichia coli Removal from Lake Water  • Presenting author: Peining Guan, McGill University, Montreal, Quebec, Canada (Shiv Prasher, Muhammad Afzal, Sajj George, Jennifer Ronholm) 1901384

10:05am  The Role of Soil Amendments on Nutrient and Water Use Efficiency of Green Pepper  • Presenting author: Joba Purkayastha, McGill University, Laval, Quebec Canada (Shive Prasher, Muhammad Afzal, Ramanbhai Patel, Christopher Nziediegwu, Ali Mawof) 1900858

10:20am  Adsorption of Hydrogen Sulfide on Biochars from Pallet Wood Waste  • Presenting author: Catherine E. Brewer, New Mexico State University, Las Cruces, NM (Luis Moreno Martin, Gustavo Hernandez, Zachary Montoya, Jacob Koranten-Amoako, Lucion Derry, Jonah Levine, Delia Valles-Rosales) 1900359

10:35am  BREAK

10:45am  Molten Salt Activation of Hydrochar Produced from the Digestate of Anaerobic Digestion for Synthesis of Porous Carbon  • Presenting author: Bo Zhang, North Carolina A&T State University, Summerfield, NC (Lijun Wang) 1900222

11:00am  Effect of Activating Agent Type and Impregnation Route on Properties of Activated Carbon Synthesized from Herbaceous Biomass  • Presenting author: Oluwatosin Oginni, West Virginia University, Morgantown, WV (Kaushlendra Singh, Louis McDonald, Gloria Oporto, Edward Sabolsky, Benjamin Dawson-Andoh) 1900609

11:15am  Characterization of Biochar from Different Feedstocks under Low and High Temperature  • Presenting author: Syed Rahman, North Dakota State University, Fargo, ND (Syed Rahman, Shafiqur Rahman) 1900457

11:30am  Evaluation of Agricultural Impacts and Carbon Sequestration on Application of Biochar Pellet as Slow Release Fertilizer in Rice Paddy  • Presenting author: JoungDu Shin, National Institute of Agricultural Sciences, JunJu Korea (SungLee Lee, EunJeong Choi, EunSuk Jang, SangWon Park, Changyoo Jeong) 1900043

11:45am  Effect of Pyrolysis on Oxygen Functional Groups of Hydrochars  • Presenting author: Nepu Saha, Ohio University, Athens, OH (Nepu Saha, Danhui Xin, Pei Chiu, M. Toufiq Reza) 1900902

102 Conservation Agriculture for Sustainable Intensification—INVITED
Monday, July 8, 9:30am-12:00pm
Location: Salon H
Sponsored by: E-2050
Moderator: Manuel Reyes, Kansas State University

9:35am  Testing the Oggun Tractor for Conservation Agriculture Production System in Cambodia  • Presenting author: Lyhour Hin, Sustainable Intensification Innovation Lab, Kansas State University (L. Hin, H. Clemmons, V. Leng, F. Tivet, S. Vuthy, M. Reyes) 1901939

9:45am  Design and Development of Conservation Agriculture Machine Prototype for Cambodian Farmers  • Presenting author: Saruth Chan, Ministry of Agriculture, Forestry, and Fisheries, Cambodia (Saruth Chan) 1901940

10:00am  Solar Drip Irrigation Project in Burkina Faso  • Presenting author: Aijit Srivastava, Michigan State University, East Lansing, MI (A. Srivastava, T. Harrigan) 1901941

10:15am  Testing the Maji Solar Pump and Irrigation Water Management in the Ethiopian Highlands  • Presenting author: Seifu Tillahun, Bahr Dar Institute of Technology, Bahr Dar University, Ethiopia (S. Tillahun, S.G. Gebeyehu) 1901942

10:30am  BREAK

10:40am  Identifying the Best Tools for Conservation Agriculture Commercial Vegetable Homegarden Production System  • Presenting author: Pao Srean, Faculty of Agronomy, University of Battambang, Cambodia (P. Srean, S. Lo, S. Rien) 1901943

10:55am  Assessing Early-Stage Agricultural Machinery Technologies For Gender Sensitivity—Experience Conducting Gender Technology Assessments in Cambodia, Bangladesh, Burkina Faso and Ethiopia  • Presenting author: Maria Jones, University of Illinois, Urbana, IL (Maria Jones) 1901985

11:10am  Overcoming the Valley of Death: Linking Research and the Private Sector  • Presenting author: Rajiv Pradhan, Swisscontact, Cambodia (Rajiv Pradhan) 1901944

11:25am  Conservation Agriculture with Drip Irrigation for Commercial Vegetable Homegardens Training Package  • Presenting author: Ruth McDaniel, Kansas State University, MasRiego Project, KS (M. Reyes, R. McDaniel, R. Walle, A. de Leon Ceto) 1901945

11:40am  Overview: Conservation Agriculture with Drip Irrigation for Commercial Vegetable Homegardens Training Package  • Presenting author: Antonio de Leon Ceto, Universidad Rafael Landivar, Guatemala City, KSU MasRiego Project, Universidad de San Carlos, Quetzaltenango, Guatemala (Ruth McDaniel, Antonio De Leon, Jorge Rodriguez, Robert Walle, Manuel Reyes) 1901946
103 Educational Approaches for Facilitating Digital Agriculture—RAP
Monday, July 8, 9:30am-12:00pm
Location: Salon J
Sponsored by: EOPD-203
Moderator: Luis Rodrigues, University of Illinois, Urbana, IL
9:35am  A Tale of Two Courses: Challenges and Opportunities for Bringing Data Science into the Biological and Agricultural Engineering Curriculum  •  Presenting author: Natalie Nelson, North Carolina State University, Raleigh, NC (Natalie Nelson) 1901200
9:50am  Data Science Training for Biological Systems and Agriculture Engineering Majors: A Conceptual Framework  •  Presenting author: Francisco Munoz-Arriola, Department of Biological Systems Engineering and School of Natural Resources, University of Nebraska-Lincoln, Lincoln, NE (Gabriel Lopez-Morteo, Francisco Munoz-Arriola) 1901650
10:05am  Evapotranspiration Analytics in Decision Support Tools for Groundwater Mapping in Irrigated Landscapes: An Undergraduate Research Experience in Hydroinformatics  •  Presenting author: Allison Hauger, University of Nebraska–Lincoln, Lincoln, NE (Allison Hauger, Francisco Munoz-Arriola, Alessandro Amaranto, Jessica Johnson, Joel Cantu-Guerrero, Joanne Craven, Gerald Corzo, Dimitri Solomatine) 1901713
104 Thinking Outside the Furrows: Startup Companies are Changing the World—PANEL
Monday, July 8, 9:30am-12:00pm
Location: MIT
Sponsored by: EOPD-416
Moderator: Tony Grift, University of Illinois, Urbana, IL
105 Current Achievements and New R&D Trends in Renewable Energy Resources and Technologies —INVITED
Monday, July 8, 9:30am-12:00pm
Location: Harvard
Sponsored by: ES-210
Moderator: Sarah Wu, University of Idaho, Moscow, ID
9:35am  Advances in Biomass Power Generation Using Fluidized Bed Gasification Techniques: Update of Current State of the Art and Report of Challenges and Opportunities  •  Presenting author: Sergio C. Capareda, Texas A&M University, College Station, TX (Sergio Capareda) 1901932
9:55am  Thermodynamic and Economic Analysis of Dead-Biomass Harvesting in Apalachicola National Forest Area  •  Presenting author: Satyanarayan Dev, Florida A&M University, Tallahassee, FL (Satyanarayan R.S. Dev, Johnny Grace III, Ying Ouyang, Aavudai Anandhi) 1901550
10:15am  Using Agent-Based Modeling to Examine the Adoption of Bioenergy Crops in Agricultural Production Areas  •  Presenting author: Damon S. Hartley, Idaho National Laboratory, Idaho Falls, ID (Damon S. Hartley, Ruby T. Nguyen, L. Michael Griffe, Yingqian Lin, Pralhad H. Burli) 1901704
10:35am  BREAK
### Monday, July 8

#### 107 Value-Added Chemicals and Products and Lignin Valorization

**Monday, July 8, 9:30am-12:00pm**  
Location: Northeastern  
Sponsored by: ES-220  
Moderator: Sushil Adhikari, Auburn University, Auburn, AL

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenting Authors</th>
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<tbody>
<tr>
<td>9:35am</td>
<td>Valorization of Rendering Animal Proteins to Value-Added Astaxanthin-rich Animal Feed</td>
<td>Sang Li, Kansas State University, Manhattan, KS (Sang Li, David Ladner, Yi Zheng) 1900398</td>
</tr>
<tr>
<td>9:50am</td>
<td>Metal Doped Active CaO Catalyst from Waste Eggshells for Micro Algal Biofuel Production</td>
<td>Nurhan Dunford, Oklahoma State University, Stillwater, OK (Velentina Das, Dhanapati Deka, Nurhan Turgut Dunford, Abhishek Mani Tripathi) 1901381</td>
</tr>
<tr>
<td>10:05am</td>
<td>Maleic Acid and AlCl₃-Catalyzed Production of 5-Hydroxymethylfurfural from Glucose</td>
<td>Jonathan C. Overton, Purdue University, Indianapolis, IN (Jonathan C. Overton) 1900183</td>
</tr>
<tr>
<td>10:20am</td>
<td>Co-Products and Biofuels from Guar and Guayule Processing Residues</td>
<td>Catherine E. Brewer, New Mexico State University, Las Cruces, NM (Meshaek Audu, Mustafa Dehghanizadeh, Feng Cheng, Hengameh Bayat, Omar Holguin, Umakanta Jena) 1900361</td>
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<tr>
<td>10:35am</td>
<td>BREAK</td>
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<td>10:45am</td>
<td>Synthesis of Hydrochars from Swine Manure</td>
<td>Praveen Kolar, North Carolina State University, Raleigh, NC (Praveen Kolar, Zac Lentz, John Classen) 1901102</td>
</tr>
<tr>
<td>11:00am</td>
<td>Production of Char as a Byproduct from Cardboard Waste Treatment</td>
<td>Sebastian Fricke, McGill University, Montreal, Quebec, Canada (Shiv Prasher) 1901597</td>
</tr>
<tr>
<td>11:15am</td>
<td>Production of 2,3-Butanediol from Food Waste Using Bacillus licheniformis YNPS-TSU from Yellowstone National Park</td>
<td>Haibo Huang, Virginia Tech, Blacksburg, VA (Dajun Yu, Nicholas Poe, Joshua O’hair, Suping Zhou, Haibo Huang) 1901814</td>
</tr>
<tr>
<td>11:30am</td>
<td>Understanding Co-Pyrolysis of Lignin with Silicon Nanoparticles</td>
<td>Wencheng Zhang, University of Kentucky, Lexington, KY (Wencheng Zhang) 1900775</td>
</tr>
<tr>
<td>11:45am</td>
<td>Co-Pyrolysis of Lignin and Polymers Using Red Clay as Catalyst in a Micro-Pyrolyzer</td>
<td>Vivek Patil, Auburn University, Auburn, AL (Vivek Patil) 1900857</td>
</tr>
<tr>
<td>12:15pm</td>
<td>Antimicrobial Properties of Lignin Derivatives from Thermochemical Depolymerization</td>
<td>Ryan Kalinoski, University of Kentucky, Lexington, KY (Ryan Kalinoski) 1900854</td>
</tr>
</tbody>
</table>

#### 108 Safety Considerations in Agriculture

**Monday, July 8, 9:30am-12:00pm**  
Location: Tufts  
Sponsored by: ESH-04; ESH-04/1  
Moderator: Gretchen Mosher, Iowa State University, Ames, IA

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9:35am</td>
<td>Agricultural All-Terrain Vehicle Safety</td>
<td>Farzaneh Khorsandi, Department of Biological and Agricultural Engineering, University of California, Davis, CA (Farzaneh Khorsandi, Paul Ayers, Gerene Denning, Charles Jennissen, Dee Jepsen, Melvin Myers, Stephen Oesch, Michael Pate, David White, Aaron Yoder) 1901429</td>
</tr>
<tr>
<td>9:50am</td>
<td>Agricultural Work-Related Fatalities to Non-Working Youth: What Can We Learn?</td>
<td>Michael Pate, Penn State University, University Park, PA (Michael Pate) 1900304</td>
</tr>
<tr>
<td>10:05am</td>
<td>Measurement of Static Lateral Stability Angle and Roll Moment of Inertia for Agricultural Tractor with Attached Implement</td>
<td>Van Nang Nguyen, Institute of Agricultural Machinery, Naro, Japan (Van Nang Nguyen, Yasuhiro Harada, Hiroki Takimoto, Kota Shimomoto) 1900312</td>
</tr>
<tr>
<td>10:20am</td>
<td>Development of Dynamic Mechanism for the Prevention of Tractor Rollover by Employing Active Steering</td>
<td>Zhen Li, Beijing, China (Zhen Li) 1900654</td>
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<tr>
<td>10:35am</td>
<td>BREAK</td>
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<tr>
<td>10:45am</td>
<td>Improving Safety and Health in the Cattle Feedyard Industry–Current Status</td>
<td>Aaron M. Yoder, PhD, University of Nebraska, Omaha, NE (Aaron M. Yoder, Daniel Kent) 1901498</td>
</tr>
<tr>
<td>11:00am</td>
<td>Use of Mixed Methods to Identify Worker Safety Hazards on Midwest Agribusiness Construction Sites</td>
<td>Gretchen Mosher, Iowa State University, Ames, IA (Gretchen Mosher) 1900863</td>
</tr>
<tr>
<td>11:15am</td>
<td>Investigation on the Influence of Different Rear Tracks on the Lateral Stability of Tractor Employing Model Test</td>
<td>Zhen Li, Beijing, China (Zhen Li) 1900655</td>
</tr>
<tr>
<td>11:30am</td>
<td>Evaluation of the Crush Protection Zone of Three Crush Protection Devices</td>
<td>Farzaneh Khorsandi, Department of Biological and Agricultural Engineering, University of California, Davis, CA (Farzaneh Khorsandi, Paul Ayers, Eric Fong) 1901457</td>
</tr>
</tbody>
</table>

#### 109 Big Data and Data Analysis for Agricultural Applications

**Monday, July 8, 9:30am-12:00pm**  
Location: Tremont  
Sponsored by: ITSC-254  
Moderator: Mario R. Mondaca, University of Wisconsin, Madison, WI

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9:35am</td>
<td>Precision Livestock Farming Big Data for Computer Vision and Machine Learning Applications: PLFBD</td>
<td>Hugo Milan, Cornell University, Ithaca, NY (Hugo Milan) 1900854</td>
</tr>
</tbody>
</table>
Monday, July 8

Kristen M. Perano, Gustavo A. B. Moura, Patric A. Castro, Bharath Hariharan, Alex S. C. Maia, Kiffe G. Gebremedhin] 1901517

9:50am Supervision and Big Data Application of Agricultural Chemical Inputs Used by Small-Scale Farmers in the Hilly and Mountainous Areas  Presenting author: Jiayi Huang, Guangdong Institute of Modern Agricultural Equipment, Guangzhou, Guangdong, China (Jiayi Huang, Dachun Feng, Ming Pan, Qiubo Xie) 1900705

10:05am Combine Harvester Unloading Event Inference Using GPS Data  Presenting author: Yang Wang, Purdue University, West Lafayette, IN (Yaguang Zhang, Dennis Buckmaster, James Krogmeier) 1901286

10:20am Understanding and Incorporating Stakeholder Perspectives in International Engineering: A Phrase Mining and Qualitative Comparative Analysis  Presenting author: Kelsey Schreiber, University of Illinois-Urbana, Barrington, IL (Kelsey Schreiber, Luis Rodriguez, Ann-Perry Witmer, Brian Dill) 1901425

10:35am BREAK

10:45am Multi-Source Data Analysis in Pearl Cold Chain Logistics  Presenting author: Jingjing Liu, Shihezi University, Shihezi, Xinjiang, China (Jingjing Liu, Zhigang Li, Xu Zhang, Xiaoshuan Zhang) 1900549

11:00am Developing Weather Index-Based Crop Insurance for Small Growers in Paraguay  Presenting author: Clyde Fraisse, University of Florida, Gainesville, FL (Eduardo Gelcer, Mauricio Karrei, Luis Rodríguez, Ann-Perry Witmer, Brian Dill) 1900250

11:15am A Cloud-Service Enabled Decision Support Platform for Regional Wheat Harvesting Management  Presenting author: Tao Lin, Zhejiang University, Hangzhou, Zhejiang, China (Zhixian Lin, Yuqi Jiang, Jundu Zhan, Jindi Zeng, Zhenhong Du, Tao Lin) 1901138

11:30am Deep Learning Based Corn Yield Estimation: A Flexible Data-Driven Approach  Presenting author: Renhai Zhong, Zhejiang University, Hangzhou, Zhejiang, China (Renhai Zhong, Hao Jiang, Jinfan Xu, Tao Lin) 1900702

11:45am Prediction of NO3, K, Ca, and Mg Ions in Hydroponic Solutions Using Neural Network Model with an Array of Ion-Selective Electrodes  Presenting author: Woo-Jae Cho, Seoul National University, Gwanak-gu, Seoul, South Korea (Woo-Jae Cho, Hak-Jin Kim, Dae Hyun Jung, Hee-Jo Han, Young-Youl Cho) 1901039

12:00pm Detection of Concrete Crack Using Deep Learning and Transfer Learning Technique  Presenting author: Sangik Lee, Seoul National University, Seoul, South Korea (Sangik Lee, Kyungmo Yang, Jonghyuk Lee, Jungu Lee, Won Choi) 1901042

12:15pm Interpretable Modeling for Yield Trends of Corn and Soybean in the Midwest  Presenting author: Somali Chaterji, Purdue Univ, W Lafayette, IN (Rakesh Kumar, Dennis Buckmaster, Somali Chaterji) 1900329

110 Computational Fluid Dynamics (CFD) Applications in Agriculture

Monday, July 8, 9:30am-12:00pm
Location: Vineyard
Sponsored by: ITSC-217; PAFS-40; ITSC-254
Moderator: Christopher Choi, University of Wisconsin-Madison, Madison, WI

9:35am Numerical Evaluation of the Indoor Hygrothermal Condition for the Novel Six-Storey Barn  Presenting author: Xiaoshuai Wang, Zhejiang University, Hangzhou, China (Xiaoshuai Wang, Chao Qin, Jiegang Wu, Allun Wang, Kaiying Wang) 1901868

9:50am CFD Prediction of Heat Transfer in Heated or Cooled Concrete Floor in Laying Areas for Pig  Presenting author: Bjarne Bjerg, University of Copenhagen, Denmark (‘Bjarne Bjerg, Peter Kai) 1900735

10:05am Fast Gas-Solid Flow Simulation for Control of the Pneumatic Conveying System on Air Seeders  Presenting author: Jason Cousins, University of Saskatchewan, Saskatoon, SK, Canada (Scott Noble) 1901667

10:20am Effects of Baffles on Airflow Patterns, Heat and Mass Transfer in Mechanically Ventilated Dairy Housing Using Computational Fluid Dynamics  Presenting author: Seunghyeon Jung, University of Wisconsin-Madison, Madison, WI (Seunghyeon Jung, Xiaoshuai Wang, Mario Mondaca, Wey Ling Ong, Christopher Choi) 1901846

10:35am BREAK

10:45am A Large-Scale Computational Fluid Dynamic Evaluation of Tunnel Ventilation Design and Its Effect on the Cow Level Microenvironment  Presenting author: Wey Ling Ong, University of Wisconsin-Madison, Madison, WI (Mario Mondaca, Christopher Choi, Wey Ling Ong, Nigel Cook) 1901479

11:00am Predicting Dust Cloud Concentration Using CFD-DPM Modeling Approach  Presenting author: Yumeng Zhao, Purdue University, West Lafayette, IN (Kingsly Ambrose) 1900426

11:15am The Study of Stirring Influence Factors on Pteris Vittata L. Spore Solution for Sowing Operation Based on CFD  Presenting author: Kang Wu, Zhejiang University, Hangzhou City, Zhejiang Province, China (Kang Wu, Jianping Li, Junyang Chen, Songming Zhu) 1900273

11:30am Assessment of Mesh Types for Modelling Pigs in CFD Simulations  Presenting author: Mengbing Cao, China Agricultural University, Beijing, China (Mengbing Cao, Guanghui Teng, Yanrong Zhuang, Zhenyu Zhou, Kang Zhou, Chao Zong) 1900671

11:45am Evaluation of Heat Transfer Inside the Phloem of a Tree during Heat Treatment of HLB-Infected Citrus Tree by CFD  Presenting author: Shirin Ghatehresamani, University of Florida, Gainesville, FL (Shirin Ghatehresamani, Yiannis Ampatzidis) 1900801

NO-SHOW Surround Climate Conditions Analysis Using CFD in a Side Wall Green  Presenting author: Jorge Flores Velazquez, 725, Progreso, Jiutepec Mexico (Fernando Rojajui Aguilar, Ernesto Cruz Rodriguez) 1900220

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
11:30am Corn-Steel Interaction Force Prediction Accuracy of Discrete Element Method in Paddle Elevator Conveyor • Presenting author: Mehari Tekeste, Iowa State University, Ames, IA (Mehari Tekeste, Carol Plouffe, Donald Harby) 1901358

11:45am ROCKY DEM- CFD Simulation for Realistic Granular Flow in an Aerodynamic Separating Device • Presenting author: Mahmoud A. Elemam, Research Center of Fluid Machinery Engineering and Technology, Jiangsu university, Jiangsu, China (Mahmoud Ahmed El-Emam, Shi Wei Dong, ling Zhou, Chen Han) 1900387

12:00pm Discrete Element Simulations and Experiments of Soil Disturbance Behaviours as Affected by the Upward Angle of Subsoiler’s Wing • Presenting author: Xuezhen Wang, Northwest A&F University, Yangling, Shaanxi, China (Xuezhen Wang, Ruixiang Zhu, Yuxiang Huang) 1900390

11:45am Deep-Learning Feature Extraction Method for Hyperspectral Image Analysis of Nitrogen in Oilseed Rape (Brassica napus L.) Leaves • Presenting author: Yueming Zhu, Zhejiang University, Hangzhou China (Yueming Zhu, Haiyan Cen, Ahmed Islam El-Manawy, Haiyong Weng, Yong He) 1900541

9:30am Improving the Determination of Discrete Element Method (DEM) Parameters for Agricultural Soils • Presenting author: John Fielke, University of South Australia, Mawson Lakes, Australia (Mustafa Ucgul, Chris Saunders, John Fielke) 1900988

10:05am Determination of the Physical Properties of Corn and Wheat Kernels for DEM Simulations • Presenting author: Zhengpu Chen, Purdue University, West Lafayette, IN (Zhengpu Chen, Kingsly Ambrose, Eric Veikle, Carl Wassgren) 1901323

10:20am Calculation of Load Profiles on a Cultivator Tine Using the Discrete Elements Method • Presenting author: Johannes Bührke, Braunschweig, Niedersachsen, Germany (Florian Schramm, Ludger Frerichs) 1900512

10:35am BREAK

10:45am Wear Simulation of Tillage Tools with the Discrete Element Method • Presenting author: Florian Schramm, Institute of Mobile Machines and Commercial Vehicles, Technische Universität Braunschweig, Braunschweig, Germany (Johannes Bührke, Ludger Frerichs) 1900413

11:00am A Method for Finding the Critical Time Step of the Damped Flexible Fiber DEM Model • Presenting author: Matthew Schramm, Iowa State University, Ames, IA (Mehari Tekeste, Carol Plouffe, Donald Harby) 19001676

11:15am Modeling the Residue Incorporation Capability of Various Tillage Tools Using Discrete Element Method • Presenting author: Bob Zhiwei Zeng, University of Manitoba, Winnipeg, Manitoba Canada (Zhiwei Zeng, Ying Chen, Long Qi) 1901358

11:30am Corn-Steel Interaction Force Prediction Accuracy of Discrete Element Method in Paddle Elevator Conveyor • Presenting author: Mehari Tekeste, Iowa State University, Ames, IA (Mehari Tekeste, Carol Plouffe, Donald Harby) 1901358

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12:00pm Discrete Element Simulations and Experiments of Soil Disturbance Behaviours as Affected by the Upward Angle of Subsoiler’s Wing • Presenting author: Xuezhen Wang, Northwest A&F University, Yangling, Shaanxi, China (Xuezhen Wang, Ruixiang Zhu, Yuxiang Huang) 1900390

12:15pm DEM Modeling of Corn Silage Harvester Feeding Behavior • Presenting author: Fan Chengxiao, Shi Hezi University, Shi Hezi, Xinjiang, China (Fan Chengxiao, Li Zhigang, Liu Yangchun, Dong Xin, Wang Meng, Wang Fengzhu) 1900944

111 Discrete Element Modelling (DEM) Applications in Agriculture
Monday, July 8, 9:30am-12:00pm
Location: Clarendon
Sponsored by: ITSC-217; MS-45
Moderator: John Fielke, University of South Australia, Mawson Lakes, Australia

9:35am Improving the Determination of Discrete Element Method (DEM) Parameters for Agricultural Soils • Presenting author: John Fielke, University of South Australia, Mawson Lakes, Australia (Mustafa Ucgul, Chris Saunders, John Fielke) 1900988

NO-SHOW Soil Compaction under Cattle Hoof Using Discrete Element Modelling (DEM) • Presenting author: Mohammad Sadek, Cal Poly State University, San Luis Obispo, CA (Mohammad Sadek) 1901160

10:05am Determination of the Physical Properties of Corn and Wheat Kernels for DEM Simulations • Presenting author: Zhengpu Chen, Purdue University, West Lafayette, IN (Zhengpu Chen, Kingsly Ambrose, Eric Veikle, Carl Wassgren) 1901323

10:20am Calculation of Load Profiles on a Cultivator Tine Using the Discrete Elements Method • Presenting author: Johannes Bührke, Braunschweig, Niedersachsen, Germany (Florian Schramm, Ludger Frerichs) 1900512

10:35am BREAK

10:45am Wear Simulation of Tillage Tools with the Discrete Element Method • Presenting author: Florian Schramm, Institute of Mobile Machines and Commercial Vehicles, Technische Universität Braunschweig, Braunschweig, Germany (Johannes Bührke, Ludger Frerichs) 1900413

11:00am A Method for Finding the Critical Time Step of the Damped Flexible Fiber DEM Model • Presenting author: Matthew Schramm, Iowa State University, Ames, IA (Mehari Tekeste, Carol Plouffe, Donald Harby) 19001676

11:15am Modeling the Residue Incorporation Capability of Various Tillage Tools Using Discrete Element Method • Presenting author: Bob Zhiwei Zeng, University of Manitoba, Winnipeg, Manitoba Canada (Zhiwei Zeng, Ying Chen, Long Qi) 1901358

11:30am Corn-Steel Interaction Force Prediction Accuracy of Discrete Element Method in Paddle Elevator Conveyor • Presenting author: Mehari Tekeste, Iowa State University, Ames, IA (Mehari Tekeste, Carol Plouffe, Donald Harby) 19001676

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12:00pm Discrete Element Simulations and Experiments of Soil Disturbance Behaviours as Affected by the Upward Angle of Subsoiler’s Wing • Presenting author: Xuezhen Wang, Northwest A&F University, Yangling, Shaanxi, China (Xuezhen Wang, Ruixiang Zhu, Yuxiang Huang) 1900390

12:15pm DEM Modeling of Corn Silage Harvester Feeding Behavior • Presenting author: Fan Chengxiao, Shi Hezi University, Shi Hezi, Xinjiang, China (Fan Chengxiao, Li Zhigang, Liu Yangchun, Dong Xin, Wang Meng, Wang Fengzhu) 1900944

112 Imaging Technologies for High Throughput Phenotyping Part I
Monday, July 8, 9:30am-12:00pm
Location: Berkeley
Sponsored by: ITSC-312; MS-48; ITSC-348
Moderator: Haiyan Cen, Zhejiang University, Hangzhou, Zhejiang China

9:35am Deep-Learning Feature Extraction Method for Hyperspectral Image Analysis of Nitrogen in Oilseed Rape (Brassica napus L.) Leaves • Presenting author: Yueming Zhu, Zhejiang University, Hangzhou China (Yueming Zhu, Haiyan Cen, Ahmed Islam El-Manawy, Haiyong Weng, Yong He) 1900541

9:50am UAV-Based High Throughput Phenotyping in Specialty Crops Utilizing Artificial Intelligence • Presenting author: Yiannis Ampatzidis, University of Florida, Immokalee, FL (Yiannis Ampatzidis, Victor Partel) 1900293

10:05am High-Throughput Image Analysis Framework for Fruit Detection, Localization and Measurement from Video Streams • Presenting author: Yi-Hsuan Huang, National Taiwan University, Taipei, Taiwan (Ta-Te Lin) 1900487

10:20am Development of a Quick-Install Rapid Phenotyping System • Presenting author: Roberto Buelvas, McGill University, Montreal, Quebec Canada (Viacheslav Adamchuk) 1900130

10:35am BREAK

10:45am Early Prediction of Soybean Traits through Color and Texture Features of Canopy RGB Imagery • Presenting author: Wenan Yuan, University of Nebraska–Lincoln, Lincoln, NE (Wenan Yuan, Nuwan Kumara Wijewardane, Yufeng Ge) 1900980

11:00am Vegetation Indices Comparison with Green Chromatic Coordinates from Phenocam Images • Presenting author: Sunoj Shajahan, North Dakota State University, Bismarck, ND (Sunoj Shajahan, Igathinathane Cannayen, John Hendrickson) 1901261

11:15am Evaluation of Cotton Stand Count Using UAV-Based Hyperspectral Imagery • Presenting author: Aijing Feng, Division of Food Systems and Bioengineering, University of Missouri, Columbia, MO (Aijing Feng, Kenneth Sudduth, Earl Vories, Jianfeng Zhou) 1900807


11:45am Detecting Early Signatures of Sorghum and Xanthomonas Holcicola Interaction Using Hyperspectral Imaging • Presenting author: Sanaz Jarolmasjed, Danforth Plant Science Center, Saint Louis, MO (Sanaz Jarolmasjed, Qi Wang, Noah Falgren, Rebecca Bart, Malia Gehan) 1901190
Monday, July 8

12:00pm  Is it Possible to Estimate Photosynthesis Capacity and Evapotranspiration Rate for Plant Breeding?  · Presenting author: Yufeng Ge, University of Nebraska, Lincoln, NE (Geng Bai, Yufeng Ge, Bryan Levitt, Yi Qi, Gamon John, James Schnable, Xin Qiao, Weizhen Hou, Tala Awada) 1901114

113 Machine Vision Applications in Vegetables and Fruits  Monday, July 8, 9:30am-12:00pm  Location: Arlington  Sponsored by: ITSC-312  Moderator: Shih-Fang Chen, National Taiwan University, Taipei, Taiwan China 9:35am  Identifying and Localizing the Disease Spots of Late Blight on Tomato Leaves Using Deep Convolutional Neural Networks  · Presenting author: Hsueh-Hung Cheng, National Taiwan University, Taipei, Taiwan (Yan-Ling Ke, Chu-Ping Lin, Jin-Hsing Huang, Yan-Fu Kuo) 1900445

9:50am  Monitoring Growth Rate of Lettuce Using Deep Convolutional Neural Networks  · Presenting author: Jie-Yan Lu, National Taiwan University, Taipei, Taiwan (Chung-Liang Chang, Yan-Fu Kuo) 1900341

10:20am  Application of Data Augmentation and Migration Learning in Identification of Diseases and Pests in Tea Trees  · Presenting author: Jiayi Huang, Guangdong Institute of Modern Agricultural Equipment, Guangzhou, Guangdong, China (Jiayi Huang, Mengxi Zeng, Weixia Li, Xiangbao Meng) 1900919

10:35am  BREAK

10:45am  Design of On-line Detection Device for Grain Breakage of Corn Harvester Based on OpenCV  · Presenting author: Xiaolong Zhu, China Agricultural University, Haidian, Beijing, China (Xiaolong Zhu, Yuefeng Du, Ruijuan Chi, Xiaojie Deng, Zhang Zhen) 1900704

11:00am  Vision Intelligence Guided Strawberry Decalyx Machine—Automatic Vision-Guided Intelligent Decalyxing Network (AViDnet)  · Presenting author: Dongyi Wang, University of Maryland, College Park, MD (Dongyi Wang, Robert Vinson, Maxwell Holmes, Gary Seibel, Xuemei Cheng, Yang Tao) 1901905

11:15am  Deep Convolutional Neural Networks for Fruit Tree Classification and Spatial Analysis Using Aerial Imagery  · Presenting author: Yu-Fang Hsieh, National Taiwan University, Taipei, Taiwan (Yu-Fang Hsieh, Po-Ting Liu, Pao-Chang Lin, Cheng-Ying Chou) 1901110


11:45am  Temporal Leaf Tracking of Maize Plants Using a Convolutional Neural Network  · Presenting author: Yin Bao, Iowa State University, Ames, IA (Yin Bao, Lie Tang, Stephen Howell, Steven Whitham) 1901361

NO-SHOW  Machine Learning for Classification of Thin-Shell Walnut Cultivars Based on Imaging  · Presenting author: Zhiqiang Zhai, Shihezi University, Shihezi, Xinjiang, China (Zhiqiang Zhai, Kunlin Chen, Rui Li, Ahmad Al-Mallahi, Longsheng Zhang) 1901260

11:45am  Temporal Leaf Tracking of Maize Plants Using a Convolutional Neural Network  · Presenting author: Yin Bao, Iowa State University, Ames, IA (Yin Bao, Lie Tang, Stephen Howell, Steven Whitham) 1901361

12:15pm  Improved Machine Vision System for Robotic Harvesting in Apple Orchards  · Presenting author: Santosh Bhusal, Washington State University, Prosser, WA (Santosh Bhusal, Uddhav Bhattacharji, Manoj Karkee, Qin Zhang) 1901046

12:30pm  Optimizing Parameters for Image Processing Techniques Using Machine Learning to Detect Powdery Mildew in Strawberry Leaves  · Presenting author: Jaemyung Shin, Dalhousie University, Truro, NS, Canada (Jaemyung Shin, Young K. Chang, Tri Nguyen-Quang, Brandon Heung, Prabahar Ravichandran) 1901347

114 Machine Vision for Precision Agriculture and Robotics  Monday, July 8, 9:30am-12:00pm  Location: Provincetown  Sponsored by: ITSC-312; MS-54  Moderator: Daene Chin, Penn State University, University Park, PA

9:35am  Developing a High Precision Cotton Boll Counting System Using Active Sensing  · Presenting author: Tsunghan Han, University of Georgia, Athens, GA (Changyi Li) 1901343

9:50am  Synthetic Images for Weed and Crop Segmentation Based on Deep Learning  · Presenting author: Junfeng Gao, Ghent University, Ghent, East Flanders, Belgium (Junfeng Gao, Michael Pound, Andrew French, Yong He, Tony Pridmore, Jan Pieters) 1900261

10:05am  Development of a Multi-Angle Imaging System for Automatic Strawberry Flower Counting  · Presenting author: Hao Gan, University of Florida, Gainesville, FL (Won Suk Lee, Natalia Peres, Clyde Fraisse) 1900325

10:20am  Precision Weed Control Robot for Vegetable Fields with High Crop and Weed Densities  · Presenting author: Rekha Raja, University of California Davis, Davis, CA (Rekha Raja, David Slaughter, Steven Fennimore, Mark Siemens) 1900030

10:35am  BREAK

10:45am  Computer Vision Technology for Identification of Snap Bean Crops Using Systemic Rhodamine B  · Presenting author: Wen-Hao Su, University of California-Davis, Davis, CA (Steven Fennimore, David Slaughter) 1900075

11:00am  Improved Kiwifruit Detection Using VGG16 with RGB and NIR Information Fusion  · Presenting author: Zhihao Liu, Northwest A&T University, Xian, China (Zhihao Liu, Yali Feng, Rui Li, Shuang Zhang, Lihui Zhang, Gongpei Cui, Ahmad Al-Mallahi, Longsheng Fu, Yongjie Cui) 1901260

11:15am  Understanding Spatial and Temporal Variability in Water Status Indicators in Vineyards  · Presenting author: Sushma Thapa, Washington State University, Prosser, WA (Sushma Thapa, Chencen Kang, Manoj Karkee, Markus Keller, Qin Zhang) 1900896

11:30am  A Vision-Based Navigation Method of Rice Transplanter Based on Monocular Camera  · Presenting author:
Monday, July 8

Hai Chen, Zhejiang University, Hangzhou, Zhejiang, China (Hai Chen, Yufei Liu, Huaping Ling, Xiaoli Li, Hui Fang) 1900344

11:45am  Development of a Carrot Yield Monitoring System Using Machine Vision  Presenting author: Viacheslav I. Adamchuk, McGill University, Ste-Anne-de-Bellevue, QC, Canada (Jaesung Park, Amanda A. Boatswain Jacques, Viacheslav I. Adamchuk, Maxime Leclerc, Guillaume Cloutier) 1901167

12:00pm  Tree Trunk Position Estimation for Accurate Fruit Counts in Apple Yield Mapping  Presenting author: Thomas Jarvinen, Pennsylvania State University, State College, PA (Daeun Choi, Paul Heinemann, James Schupp, Tara Baugher) 1900918

12:15pm  Visible-Infrared Imaging and Microclimate Sensing Derived Fruit Physiology Mapping for Rain Induced Sweet Cherry Cracking Management  Presenting author: Rakesh Ranjan, Washington State University, Prosser, WA (Rakesh Ranjan, Rajeev Sinha, Guobin Shi, Matthew Whiting, Lav R Khot) 1901262

12:30pm  Development and Evaluation of an Automated Apple Tree Pruning System  Presenting author: Hassan Seyyedhasanis, Washington State University, Prosser, WA (Hasan Seyyedhasani, Uddhav Bhattarai, Manoj Karkee, Joe Davidson, Abhiseh Silwal) 1901642

115 MS—Machinery Systems POSTER SESSION

Monday, July 8, 9:30am-12:00pm.
Posters will be displayed for the entire session, but authors will be present at posters as follows:
9:30am-10:45am, authors with ODD numbered posters present
10:45am-12:00pm, authors with EVEN numbered posters present

Location: Gloucester

Sponsored by: MS-48; MS-54; ITSC-318

Moderator: Long He, Penn State University, University Park, PA

1  Design of Faba Bean Sowing Machine in Winter Fallow Field  Presenting author: Cui Tao, China Agricultural University, Beijing China (Ruimei Yang, Tao Cui, Dongxing Zhang, Yitong Du, Haifang Wu, Huihai Zhao) 1900737

2  Discrete Element Method (DEM) for Simulating Draft and Soil Movement with a Winged Narrow Point opener in Vertisols  Presenting author: Diogenes Antille, CSIRO Agriculture and Food, Canberra, Australian Capital Territory, Australia (Kojo Atta Aikins, Daniel Flippo) 1900849

3  Potential Utilization of Low Ground Pressure Tire Technology in Cotton Harvesting Equipment  Presenting author: Diogenes Antille, CSIRO Agriculture and Food, Canberra, Australian Capital Territory, Australia (Diogenes Antille) 1900039

4  Method of Control of Precision Seeding of Crops  Presenting author: Honghao Liu, College of Engineering, China Agricultural University, Beijing China (Bang Wu, Kanyu Gao, Haotun Lyu, Yu Tan, Shixiong Li, Honghao Liu) 1900938

5  Control System of Precision Fertilization of Crops  Presenting author: Honghao Liu, College of Engineering, China Agricultural University, Beijing China (Gang Wu, Lubo Zhang, Honghao Liu, Yongjun Zheng, Hengtao Ma, Liu Yang) 1901052


7  Soil Machine Dynamics Research at Iowa State University: Soil-Bin Mobility Test  Presenting author: Mehari Tekeste, Iowa State University, Ames, IA (Mehari Tekeste, Austin Hamm, Brian Steward, Stuart Birrell, Steven Mickelson, Matthew Schramm) 1901889

8  Corn Grain Yield as Influenced by Downforce and Ground Speed of Row-Crop Planters  Presenting author: Sylvester Badua, Kansas State University, Manhattan, KS (Sylvester Badua, Chinthaka Weerasekara Mudiyanselage, Ayaj Sharda) 1900885

9  Adaptive Test of Precision Sowing of Mung Bean  Presenting author: Tao Cui, Chian Agricultural University, Beijing, China (Yanan Wei, Tao Cui, Yitong Du) 1900527

10  Study on the Effect of Gravity Center Position for Maize Seed on the Performance of Metering Device  Presenting author: Tao Cui, China Agricultural University, Beijing, China (Haifang Wu, Tao Cui, Chenlong Fan, Huihui Zhao, Ruimei Yang, Yitong Du) 1900731

11  Design and Experiment of Inertia Rocker Impact Compaction Device  Presenting author: Xiangqian Dong, China Agricultural University, Beijing, China (Chao Zhang, Yapeng Sun, Xiangqian Dong, Jinnong Song, Jicheng Wang, Yang Yu, Chao Wang, Guanghao Xu) 1900262

12  Vibration Analysis of Mini-Tiller and Vibration Reduction Design of the Armrest  Presenting author: Yin Yiyong, China Agricultural University, Beijing China (Yin Yiyong, Xiang Hang, Bai Hanqin) 1900376

NO-SHOW  Presenting author: Akram Gholami, University of California, Merced, CA (Taymaz Homayouni, Arash Toudeshki, YangQuan Chen, Reza El善) 1901806

13  A Low Cost Autonomous Robot for Scouting, Estimating and Picking the Premature Almond Fall (Windfall)  Presenting author: Akram Gholami, University of California, Merced, CA (Taymaz Homayouni, Arash Toudeshki, YangQuan Chen, Reza El善) 1901806

14  Scaling up of BAU-STR Paddy Dryer in Bangladesh and Beyond  Presenting author: Chayan Kumer Shaha, Bangladesh Agricultural University, Mymensingh, Mymensingh Bangladesh (Md. Monjurul Alam) 1900571

15  Ground Autonomous Vehicle Slope Testing for Sloped Crop Field Work  Presenting author: Chetan Badguitar, Kansas State University, Manhattan, KS (Chetan Badguitar, Daniel Filippo) 1900849

16  Small Autonomous Vehicle Battery and Receptacle System  Presenting author: Daniel Filippo, Kansas State University, Manhattan, KS (Ajay Sharda, Ed Brokesh) 1900300

22  NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Monday, July 8

NO-SHOW  Monitoring method and Test of Wheat Harvester Loss Rate Based on PVDF Sensor • Presenting author: Duanyang Geng, Shandong University of Technology, Zibo, Shandong China (Delei Tan, Duanyang Geng, Qian Wang, Xingrui Yu, Yangcheng Liu, Guoliang Su) 1900939

NO-SHOW  Mechanism Analysis and Parameter Optimization of Corn Ear-Picking by Vibration • Presenting author: Duanyang Geng, Shandong University of Technology, Zibo, Shandong China (Qian Wang, Duanyang Geng, Delei Tan, Xingrui Yu, Yangcheng Liu, Guoliang Su) 1900755

20 Improvement of Dynamic Stiffness for Vibration Reduction of Electric Off-Road Vehicle Gearbox Housing • Presenting author: Gwan-Hee Son, Seoul National University, Seoul, Republic of Korea (Seung-Je Cho, Hyun-Woo Han, Ji-Tae Kim, Young-Jun Park) 1900720

21 A Study on Reduction of Ride Vibration of Cabin Suspension System in Agricultural Tractor • Presenting author: Gwan-Hee Son, Seoul National University, Seoul, Republic of Korea (Woo-Jin Chung, Gwan-Hee Son, Hyun-Woo Han, Young-Jun Park) 1900993

22 Finite Element Modeling of the Baling Process of Alfalfa in a Round Baler • Presenting author: Jiajia Fang, Purdue University, West Lafayette, IN (Jiajia Fang, Yong Zhang, Kissingly Ambrose) 1900956

23 Optimum Cleaning Brush Parameters for Effective Debris Removal on Commercial Mechanical Wild Blueberry Harvesters • Presenting author: Karen Esau, Dalhousie University, Truro, Nova Scotia, Canada (Karen Esau, Qamar Zaman, Aitazaz Farooque, Arnold Schumann) 1900452


25 Determination of Seed Rate for Mechanical Transplanting of Hybrid Paddy Variety in Bangladesh • Presenting author: Md Monjurul Alam, Bangladesh Agricultural University, Mymensingh, Bangladesh (Md. Mosharraf Hossain, Surajit Sarkar, Md. Samuil Basir, Chayan Kumer Saha, Md. Monjurul Alam, Prasanta Kumar Kalita, Alan C. Hansen) 1901177

26 A Rapid Design Method for Agricultural Machinery Components • Presenting author: Min Zhou, China Agricultural University, Beijing, China (Shurong Zhuo, Jian Jiaming, Shulin Hou, Min Zhou) 1901333

NO-SHOW  Spraying System for Targeted Applications of Agrochemicals in Potato Cropping System • Presenting author: Nazar Hussain, University of Prince Edward Island, Charlottetown PEI Canada (Aitazaz Farooque, Arnold Schumann, Qamar Zaman, Bishnu Acharya, Hassan Afzaal) 1900456

28 Analysis on Dynamics Characteristics of Vibratory Harvesting for Oil-Tea Camellia Fruit • Presenting author: Ruiyun Zhou, Zhejiang University, Hangzhou China (Kaizhan Chen, Xiaojiang Zhao, Guofeng Zhang, Ruiyun Zhou) 1900254

29 Development and Performance Evaluation of Hydraulic Control System for Corn Planter • Presenting author: Tao Cui, China Agricultural University, Beijing, China (Huihui Zhao, Tao Cui, Chenlong Fan, Haixing Wu, Ruimei Yang) 1900788

30 Design and Experiment on Reinforced Spiral Threshing and Separating Device • Presenting author: Teng Yuejiang, Zibo, Shandong China (Yuejiang Tang, Yanpu Chen, Chengqian Jin, Xiang Yin, Hongru Xie, Tingen Wang, Peng Liu, Feiyang Guo) 1900700

31 Dynamic Performance Simulation and Verification of the Chain Rake Mulching Film Recycling Machine • Presenting author: Wensong Guo, China Agricultural University, Beijing, China (Wensong Guo, Xufeng Wang, Bing Lu, Can Hu, Shulin Hou) 1900125

32 Implementation of Control System for the Manure Spreader Using Hydraulic System Based on ISO Standard • Presenting author: Woonchul Ham, Chonbuk National University, Jeonbuk-do, Republic of Korea (Enkhbat Batbayar, Sion Kim, Enkhbaatar Tumenjargal, Woonchul Ham) 190397

33 Research on the Flexible Grasping Manipulator for Stacked Bagged Agricultural Materials • Presenting author: Xiaolong Zhu, China Agricultural University, Haidian, Beijing, China (Xiaojie Deng, Ruijuan Chi, Yufeng Du, Qingqing Li, Xiaolong Zhu, Zhangzhen) 1901416

34 Research Status and Development Trend of Corn Harvester Threshing Device • Presenting author: Xiaolong Zhu, China Agricultural University, Haidian, Beijing, China (JingLin Guo, Yufeng Du, Yanhan Wu, Enrong Mao) 1900701

35 Research Progress of Alfalfa Mower Conditioner • Presenting author: Xinwu Li, China Agricultural University, Beijing, China (Xiaolong Huan, Decheng Wang, Wenpeng Ma, Yinhao Jin, Bingnan Ye, Qingyun Sun, Yunting Hui) 1900600

36 Fault Diagnosis of Motorized Spindle based on S-Transform • Presenting author: Xueyan Zhao, China Agricultural University, Beijing, P. R. China (Chao Chen, Xueyan Zhao) 1900516

37 Study on Influence of Modeling Factors on Finite Element Model of Cantilever Beam with Breathing Crack • Presenting author: Xueyan Zhao, China Agricultural University, Beijing, P. R. China (Dehao Wu, Yufeng Du, Enrong Mao, Xueyan Zhao) 1900520

38 Experimental Studies on Dynamic Characteristics of Cracked Cantilever Beam • Presenting author: Xueyan Zhao, China Agricultural University, Beijing, P. R. China (Zhaolin Zheng, Zhaoyi Chen, Gaoliang Shao, Runfeng Wang, Qian Zhang, Xueyan Zhao) 1900635

39 Test Method and Anti-Flooding Capability Analysis of Washing Airflow Distribution Characteristics of Multi-Rotor Plant Protection UAVs in Suspended State • Presenting author: Yafei Wu, China Agriculture University, Beijing, China (Yafei Wu, Lijun Qi, Zhenzhen Cheng, Yu Xiao, Zhihui Wang, Wunan Liu, Xinwu Li) 1900683

40 Review for The Detection of Crop Rows in the Field Based on Machine Vision • Presenting author: Yafei Wu, China Agriculture University, Beijing, China (Yu Xiao, Lijun Qi, Yafei Wu, Zhihui Wang, Zhenzhen Cheng, Hao Zhang, Zepeng Yang, Xinwu Li) 1900942

41 Spray Deposition and Distribution under Different Canopy Densities Based on FCM-R • Presenting author: Yafei Wu, China Agriculture University, Beijing, China (Zhenzhen Cheng, Lijun Qi, Yafei Wu, Hao Zhang, Yu Xiao, Zepeng Yang, Xinwu Li) 1900434

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Monday, July 8

42 Double-sided Non-destructive Inspection Android Application of Moldy Maize Based on Digital Image Processing
   Presenting author: Yao Lu, China Agricultural University, Beijing China (Qinglin Wang, Wei Wang, Xin Zhao, Haodong Qin, Wei Wang, Dongxing Zhang) 1901602

43 Design and Experiment of Holboellia Latifolia Peeling Machine
   Presenting author: Yao Lu, China Agricultural University, Beijing China (Shuxian Song, Wei Wang, Yao Lu, Beibei Jia, Aijun Dong, Wei Wang, Dongxing Zhang) 1901708

44 Growth Identification of Penicillium by Visible/Near-Infrared (Vis/NIR) Hyperspectral Imaging
   Presenting author: Yao Lu, China Agricultural University, Beijing China (Yao Lu, Wei Wang, Xin Zhao, Shuxian Song, Haitao Zheng) 1901601

45 Load Sharing Improvement Using Ring Gear Floating for Planetary Gear Set
   Presenting author: Young-Jun Park, Seoul National University, Seoul, Gwanak-Gu, Republic of Korea (Da-Vin Ahn, Gwan-Hee Son, Young-Jun Park) 1900403

46 Thermal Comfort Analysis of Agricultural Tractor Cabin by CFD
   Presenting author: Young-Jun Park, Seoul National University, Seoul, Gwanak-Gu, Republic of Korea (Joo Seon Oh, Gwan-Hee Son, Seung-Je Cho, Young-Jun Park) 1900712

47 Design and Analysis of Automatic Apple Packing Arm
   Presenting author: Zhou Jing, University of Missouri, Columbia, MO (Feng Binbin, Xiang Rong, Zhou Jing) 1901812

48 A New Type of Chrysanthemum Picker
   Presenting author: Rongyan Wang, Beijing China (Rongyan Wang, Zhanzheng, Baocong Cui, Dalong Jiang, Guangfei Zhu) 1901431

49 A Cam-Disc Comb-Tooth Chrysanthemum Picking Device
   Presenting author: Rongyan Wang, Beijing China (Rongyan Wang, Zhanzheng, Guangfei Zhu, Lei Gao, Baocong Cui) 1901430

50 Research Status of Harvesting Machines for Medicinal Flowers
   Presenting author: Rongyan Wang, Beijing China (Rongyan Wang, Zhanzheng, Guangfei Zhu, Lei Gao, Baocong Cui) 1901432

51 Adaptive Lifting Performance Verification Based on the Model of Cotton Top-Cutting Machine
   Presenting author: Huan Song, Yongzong Lu, Jiangsu University, Zhenjiang, Jiangsu China (Huan Song, Yongzong Lu, Weixin Wang, Xia Li) 1900153

52 Identifying Module Damage to Mitigate Potential Plastic Contamination
   Presenting author: Lucas Mitchell, North Carolina State University, Raleigh, NC (Jason Ward) 1901657

53 Farm Mechanization Trend in Nigeria: Indigenous-Quasi Efforts and Challenges
   Presenting author: Mohammed Othman, NAERLS, Ahmadu Bello University, Zaria, Kaduna Nigeria (Mohammed Othman) 1900328

NO-SHOW Design and Motion Simulation of Cotton Straw Row-Controlled Harvester Based on SolidWorks
   Presenting author: Xiaojun Gao, China Agricultural University, Beijing China (He Xiaowei, Liu Jinxiu, Xu Yang, Gao Xiaojun, Su Yuan, Xia Guoyi) 1901467

NO-SHOW Canning of Chili Plant Canopy Size Using Image Processing
   Presenting author: Chanchal Gupta, Indian Institute Of Technology Kharagpur, Kharagpur, West Bengal India (Chanchal Gupta, V. K. Tewari, Rajendra Machavaram) 1900758

NO-SHOW Management System for Soil’s Temperature and Humidity in Conservation Tillage based on Google Maps/Beidou
   Presenting author: Jiangtao Q, Jilin University, Changchun, Jilin, China (Jiangtao Q, Huibin Sun, Hongli Tian, Yang Li, Honglei Jia) 1901697

57 Analysis of Design Parameters to Improve the Accuracy of an Oval Flowmeter Based on a Novel Leakage Flow Calculation Method
   Presenting author: Sung Bo Shim, Gyeongsang National University, Jinju, Gyeongsangnamdo, South Korea (Youngjun Park, JuSeok Nam) 1901040

NO-SHOW Model of Cotton Top-Cutting Machine
   Presenting author: Yao Lu, China Agricultural University, Beijing China (Yao Lu, Wei Wang, Xin Zhao, Shuxian Song, Haitao Zheng) 1901601

NO-SHOW Efforts and Challenges in Cotton Harvesting Improvement of Dieselmotor
   Presenting author: Yao Lu, China Agricultural University, Beijing China (Yao Lu, Wei Wang, Xin Zhao, Shuxian Song, Haitao Zheng) 1901601

NO-SHOW Application of Moldy Maize Based on Digital Image Processing
   Presenting author: Yao Lu, China Agricultural University, Beijing China (Qinglin Wang, Wei Wang, Xin Zhao, Haodong Qin, Wei Wang, Dongxing Zhang) 1901602

NO-SHOW NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
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68 Experimental Study on Mechanical Properties of Connections between Alfalfa Leaves and Stems • Presenting author: Tianyi Wang, Texas A&M University, College Station, TX (Bei Wu, Decheng Wang, Guanghui Wang, Chenchen Kang, Bingnan Ye, Qingyun Sun) 1900510

69 Research Status and Development Analysis of Modular Design Technology • Presenting author: Chengxiao Fan, Shihezi University, Shihezi, Xinjiang China (Huijuan Bai, Shuai Li, Decheng Wang, Xianfa Fang, Kang Niu, Liming Zhou, Qingyun Sun, Chengxia Fan) 1900546

70 Design and EDEM Simulation of Fertilizer Stratification and Deep Application Device • Presenting author: Chengxiao Fan, Shihezi University, Shihezi, Xinjiang China (Huijuan Bai, Shuai Li, Decheng Wang, Xianfa Fang, Kang Niu, Liming Zhou, Shi Xiong, Chengxia Fan) 1900536

71 Design and Experiment of 11CH160 Type Residual Film Recovery Machine • Presenting author: Hongyi Wei, China Agricultural University, Beijing, China (Hao Fuping, Li Teng, Han Zengde, Hongyi Wei, Bingnan Ye, Qingyun Sun) 1900939

72 Dynamic Characteristics Simulation and Tests of Chassis Structure for High Clearance Sprayer • Presenting author: Hongyi Wei, China Agricultural University, Beijing, China (Tengfei Zhuang, Xuejun Yang, Xiang Dong, Herong Yan, Tie Zhang, Hongyi Wei) 1900515

73 Effects of Maize Leaf Aging on Sprayed Droplet Impact and Adhesion • Presenting author: JohnPaul R. Abbott, ARS-USDA-ATRU, Wooster, OH (Heping Zhu) 1900218

74 Developing a Control-Release Nitrogenous Fertilizer by Combination of Biochar and Sodium Alginate • Presenting author: Lin Wei, South Dakota State University, Brookings, SD (Zhisheng Cen, Lin Wei, Yajun Wu) 1900423

75 NO-SHOW Development of a Variable Rate Control System for Pesticide Application • Presenting author: Xiang Yin, Shandong University of Technology, Zibo, Shandong, China (Min Li, Chengqian Jin, Juan Du) 1900464

76 A Web Guide System for Aerial Application to Avoid Off-Target Drift Caused by Temperature Inversion through Open-Source Weather Stations • Presenting author: Yanbo Huang, USDA-ARS, Stoneville, MS (Daniel Fisher) 1900193

77 Assessments of Premixing In-Line Injection System Retrofitting on Variable-Rate Orchard Sprayers • Presenting author: Zhihong Zhang, USDA-ARS, Wooster, OH (Zhihong Zhang, Heping Zhu, Chengsong Hu) 1900346

78 Real-Time Plant Health Sensor from Low-Cost and Open-Source Electronics • Presenting author: Alex J. McLemore, Abraham Baldwin Agricultural College, Tifton, GA (Alex J. McLemore, Erin R. Porter) 1900343

79 Detection of Collected Debris during Mechanical Wild Blueberry Harvesting Using Convolutional Neural Networks • Presenting author: Anup Kumar Das, Dalhousie University, Nova Scotia Canada (Anup Kumar Das, Qamar Zaman, Travis Esau, Altazaz Farooque, Arnold Schumann) 1900569

80 Yield estimation and Mapping of Ripening Citrus Fruit Using Rapid Image Processing in Natural Background • Presenting author: Arash Toudeshki, University of California, Merced, Merced, CA (Xiaohua Zhang, Reza Ehsani, Arash Toudeshki, Fuxi Shi) 1901387

81 NO-SHOW Modeling and Remote Sensing Approaches for Site-Specific Estimation of Maize Yield Response to Fertilizer Nitrogen • Presenting author: Axel Garcia y Garcia, University of Minnesota, Lamberton, MN (Jeffrey Coulter, Axel Garcia y Garcia) 1901649

82 Design and Simulation of an Auxiliary Platform for Loading and Unloading in Train • Presenting author: Dong, Naixi., China Agricultural University, Haidian District, Beijing, China (Dong Naixi, Chi Ruijuan, Cheng Jian, Du Yufeng, Zhang Zhen, Deng Xiaojie) 1901438

83 Revisiting Annual Machine Usage Based on Used Equipment Available on Dealer Lots • Presenting author: Edwin Brokesh, Kansas State University, Manhattan, KS (Terry Griffin) 1901472

84 Based on DEM-CFD Numerical Simulation of Seed Particle Suspension Velocity Measurement • Presenting author: Gao Xiaojun, China Agricultural University, Beijing China (Gao Xiaojun, Cui Tao, Xu Yang, Yang Li, Zhang Dongxing, Su Yuan) 1901373

85 Design and Test of Zero Speed Throwing Mechanism in the Type of Reversing Wheel Type • Presenting author: Jingjing Liu, Shihezi University, Shihezi, Xinjiang, China (Huijuan Bai, Shuai Li, Decheng Wang, Xianfa Fang, Kang Niu, Liming Zhou, Zhenhao Han, Jingjing Liu) 1900537

86 Analyses of Garlic Stem Strength for Development of Cutting Machine • Presenting author: Junhee Kim, Kyungpook National University, Daegu, South Korea (Seungmin Woo, Daniel Dooyum uye, Yeongsu Kim, Donghyuck Hong, Yushin Ha) 1900955

87 Design of Water and Fertilizer Precision Ratio System Based on Neural Network PID • Presenting author: Lei Zhang, Xi’an Jiaotong University, Xi’an, Shaanxi, China (Zhengying Wei, Peicun Feng, Qian Zhang, Weibing Jia) 1900560

88 Evaluation of On-Line Mixing Uniformity Based on Decolorization • Presenting author: Ma Jing, Jiangsu University, Zhenjiang, Jiangsu Province, China (Ma Jing, Dong Xiaoya, Qiu Baijing) 1900750

89 Analysis of Nitrogen Deficiency of Bean Plant Using Digital Images • Presenting author: Murilo Mesquita Baesso, FZEA-USP, Pirassununga, São Paulo, Brazil (Murilo Mesquita Baesso, Luisa Leveghin, Edson Sardinha, Alcir José Modolo, Rafael Vieira de Sousa) 1900577

90 Object Detection with Convolutional Neural Networks for Real-Time Weed Identification in Wild Blueberry Fields • Presenting author: Patrick Hennessy, Dalhousie University, Truro, Nova Scotia Canada (Patrick J. Hennessy, Travis J. Esau, Qamar U. Zaman, Kenneth W. Corscadden, Arnold W. Schumann, Altazaz A. Farooque) 1900420

91 Laser Detection of the Boundary of UAV Spray Operation • Presenting author: Qiu Baijing, Jiangsu University, Zhenjiang, Jiangsu Province, China (Zhao Haoran, Ma Jing, Dong Xiaoya, Chen Jiadong, Qiu Baijing) 1900747

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Monday, July 8

92  Analysis of Helical Gear Reducer Using Simulation Program KISSsoft  • Presenting author: Seok Pyo Moon, Chungnam National University, Daejeon, South Korea (Seok-Pyo Moon, Kyu-Chul Nam, Tae-Bum Kim, Yeon-Jun Jung, Chang-Hyun Choi, Yong-Joo Kim) 1901038

93  Development of Deep Learning-Based Diagnosis Technology of Crop Disease and Insect Pest in RGB Images  • Presenting author: Suk-Ju Hong, Seoul National University, Seoul South Korea (Suk-Ju Hong, Sangyeon Kim, Ah-Yeong Lee, Yunhyeok Han, Barnabas Abraham Tarakey, Ghiseok Kim) 1901058

94  Mechanization of Smallholders in Sub-Saharan Africa by Agrodealer Development  • Presenting author: Sven Peets, Harper Adams University, Newport, Shropshire, United Kingdom (S. Peets, P.A. Misiewicz, S. Woods, B. Ngwene, J. Burbidge, G.R. Barlow) 1901285

95  Strength Analysis of Driving Gears for 82kW Class Tractor According to Major Agricultural Work in Korea  • Presenting author: Taek-Jin Kim, Chungnam National University, Daejeon, Republic of Korea (Taek-Jin Kim, Yeon-Jun Jung, Md Abu Alyub Siddique, Kuy-Chul Nam, Tae-Bum Kim, Chang-Hyun Choi, Yong-Joo Kim) 1901027


97  Mission Planning and Ortho-Mosaicking of UAS Imagery for Remote Sensing in Precision Agriculture on Winter Wheat and a Subsurface Drip Irrigated Corn Field  • Presenting author: Travis Ford, University of Maryland Eastern Shore, Princess Anne, MD (Abhijit Nagchadhuri, Madhumi Mitra, Chris Hartman, Jesu Raj Pandya) 1900795

98  A Real-Time Route Planning Method Based on Morphological Segmentation for Plant Protection UAVs  • Presenting author: Wu Yalei, Beijing, P.R.China (Yang Zhilun, Xiao Yu, Yang Zepeng, Wu Yalei, Qi Lijun) 1900490

99  Hydraulic Performance Analysis of Pressure-Compensating Emitter Using CFD Method  • Presenting author: Xueli Chen, Xi'an Jiaotong University, Xi'an, Shaanxi Province, China (Zhengying Wei, Caixiang Wei, Chao Ma) 1900916

100  Experimental Study on Physical Properties of Sweet Pepper Picking  • Presenting author: Bingnan Ye, China Agriculture University, Beijing China (Yunting Hui, Guoheng Chen, Bingnan Ye, Qingsun Sun, Xinxiang Li, Decheng Wang) 1900072

101  Modal Analysis of Different Shape Knife Based on ANSYS  • Presenting author: Bingnan Ye, China Agriculture University, Beijing China (Bingnan Ye, Yong You, Decheng Wang, Guanghui Wang, Qingsun Sun) 1900285

102  Design and Analysis of a New Type of Pepper Harvester  • Presenting author: Bingnan Ye, China Agriculture University, Beijing China (Yong Yu, Guanghui Wang, Decheng Wang, Qingsun Sun, Bingnan Ye) 1900746

103  Establishment and Parameter Calibration of Simulation Particles of Broad Bean Seeds in EDEM  • Presenting author: Chenlong Fan, China Agricultural University, Beijing China (Yitong Du, Tao Cui, Dongxing Zhang, Yanan Wei, Ruimei Yang, Hailiang Wu) 1900555

104  Experiment on Distribution of Mixture in Longitudinal Axial Flow Threshing Separation Device For Maize  • Presenting author: Chenlong Fan, China Agricultural University, Beijing China (Chenlong Fan, Tao Cui, Dongxing Zhang, Zhe Qu) 1900071

105  Design of Feeding Head Spiral Angle Longitudinal Axis Corn Threshing Separation Device Based on EDEM  • Presenting author: Chenlong Fan, China Agricultural University, Beijing China (Chenlong Fan, Tao Cui, Dongxing Zhang, Zhe Qu) 1900077

106  Pressure Drop during Hops Drying in Nebraska Grown Hops  • Presenting author: David Mabie, University of Nebraska-Lincoln, Lincoln, NE (Michael Kocher, David Jones) 1900450

107  Optimization of Structural Parameters for Under-the-Ground Sugarcane Basecutting  • Presenting author: Fenglei Wang, China Agricultural University, Beijing, Beijing, China (Fenglei Wang, Shaochun Ma, Wenli Ke, Haonian Xing, Jing Bai, Jinzhi Ma, Shili Gao) 1900684

108  Experimental Research on the Feeding Mechanism of Sugarcane Chopper Harvester  • Presenting author: Fenglei Wang, China Agricultural University, Beijing, Beijing, China (Jinzhi Ma, Shaochun Ma, Fenglei Wang, Haonian Xing, Jing Bai, Wenli Ke, Shili Gao) 1900687

109  An Experimental Study on a Specialized Catching Device for Mechanical Harvesting of Apples  • Presenting author: Fenglei Wang, China Agricultural University, Beijing, Beijing, China (Menglong Wang, Shaochun Ma, Haiqian Xing, Fenglei Wang, Haonian Xing, Jing Bai) 1900691

110  Present Situation and Development of Processing Mechanization of Chinese Medicinal Materials  • Presenting author: Guang-Fei Zhu, Beijing, China (Lei Gao, Zhan Zheng, Dalong Jiang, Guanfei Zhu, Shufeng Chen) 1901100

111  Design of a Whole Row Pneumatic Seedling Pick-Up Device for Fully-Automatic Field Transplanter with Reciprocating Movement and Intelligent Control System  • Presenting author: Hanping Mao, Jiangsu University, Zhenjiang China (Guoxin Ma, Hanping Mao, Luhua Han, Kaixuan Zhang, Feng Gao, Yang Liu) 1900212

112  Peanut Threshing and Shelling Machines for Community-Based Peanut Enterprises in Developing Countries  • Presenting author: Jose D. Guzman, Cagayan State University, Tuguegarao City, Cagayan, Philippines (Jose D. Guzman, Marvin C. Petingo, Ayban David P. Dom-oguen) 1901368

113  Basecutting Energy Consumption of Sugarcane Stools Using Contra-Rotating Basecutters  • Presenting author: Shaochun Ma, CAU, Beijing, China (Fenglei Wang, Shaochun Ma, Haonian Xing, Jing Bai, Jinzhi Ma, Wenli Ke) 1900645

114  A Comparison Study on Mechanized Sugarcane Production Modes in China  • Presenting author: Shaochun Ma, CAU, Beijing, China (Jing Bai, Shaochun Ma, Xiaobin Huang, Shihong He, Fenglei Wang, Haonian Xing) 1900644

115  Precise Picking Height Positioning on Wild Blueberry Harvesters Using Electric Linear Actuators  • Presenting author: Travis Esau, Dalhouse University, Truro, Nova Scotia, Canada (Travis Esau, Qamar Zaman, Craig MacEachern, Aitazaz Farooque, Meftah Mohamed) 1900453
116 Status Quo and Prospects of Licorice Mechanized Harvesting Technology in China • Presenting author: Yang Yu, China Agricultural University, Beijing China (Chao Zhang, Jiannong Song, Xiangqian Dong, Jicheng Wang, Yang Yu, Guanghao Xu, Chao Wang, Weishuai Liu, Binbin Zhu) 1901047

117 Progress in Mechanized Harvesting of Cassava in China • Presenting author: Yaohue Zhang, China Agricultural University, HaiDian District, Beijing, China (Guanghao Xu, Jiannong Song, Jicheng Wang, Xiangqian Dong, Yang Yu, Chao Zhang, Weishuai Liu, Binbin Zhu) 1901022

116 Natural Resources and Environmental Systems Distinguished Lecture Series—INVITED

Monday, July 8, 9:30am-11:00am
Location: Salon I
Sponsored by: NRES-01
Moderator: Srinivasulu Ale, Texas A&M AgriLife, Vernon, TX

9:30am The Importance of Mechanistic and Process-Based Approaches for Analyzing Natural and Environmental Systems under a Variable Climate • Presenting author: Garey Fox, Department of Biological and Agricultural Engineering, North Carolina State University, Raleigh, NC (Garey Fox) 1901959

10:00am Irrigation 4.0: How Technology and Data Science will Transform Water Management in Response to Climate Variability • Presenting author: Jay Ham, Irrigation Innovation Consortium, Department of Soil and Crop Sciences, Colorado State University, Fort Collins, CO (Jay Ham) 1901958

10:30am Coping with Increasing Climate Variability and Uncertainty: Is There a Role for Crop Models? • Presenting author: Gerrit Hoogenboom, Institute for Sustainable Food Systems; Department of Biological and Agricultural Engineering, University of Florida, Gainesville, FL (Gerrit Hoogenboom) 1901957

117 ABE Curriculum and Industry Needs in Ecological/Water Resources Engineering: A Panel Discussion
Monday, July 8, 11:00am-12:00pm
Location: Salon I
Sponsored by: NRES-21; NRES-22; NRES-223; NRES-224; NRES-225; NRES-23; NRES-24; NRES-242; NRES-244; NRES-245; NRES-25; NRES-251; NRES-252; NRES-26; NRES-262; NRES-28; EOPD-211
Moderator: Debabrata Sahoo, Woolpert Inc., West Columbia, SC

11:00am Seven Keys for Success as an Ecological Engineer • Presenting author: Greg Jennings, P.E., Jennings Environmental PLLC; Biological and Agricultural Engineering Department, North Carolina State University, Raleigh, NC (Greg Jennings) 1901971

11:15am Transforming Ecological Engineering Education Using a Hybrid Pedagogical Approach • Presenting author: Puneet Srivastava, P.E., Director of Water Resources Center: College of Agriculture, Biosystems Engineering Department, Auburn University, Auburn, AL (Puneet Srivastava) 1901969

11:30am Foundational Skills Needed for a Successful Engineering Career: A Consulting Industry Perspective • Presenting author: Derek Schlea, P.E., LimnoTech, Ann Arbor, MI (Derek Schlea) 1901970

NO-SHOW Application of PTR-MS on Assessing the Removal Efficiency of Key Odorants Emitted from Animal Wastewater Using Zr-Metal Organic Frameworks • Presenting author: Xiaorong Dai, Research Associate, Ningbo, Zhejiang Province, China (Leiping Wang, Jiannong Li, Zun Man, Dezhao Liu, Hang Xiao) 1900497

10:05am Diurnal Measurements of Methane Emissions from Feedyard Pen Surfaces during Spring and Summer in Texas • Presenting author: Kenneth Casey, Texas A&M AgriLife Research, Amarillo, TX (Kenneth Casey, David Parker, Heidi Waldrip, Mindy Spiehs, Bryan Woodbury) 1900888

11:45am Break

10:45am Manure Treatment with Acidic Liquid Biowastes for Reducing Greenhouse Gases and Ammonia Emissions • Presenting author: Omar Hijazi, Technical University of Munich, Agricultural Systems Engineering, Freising, Germany (Mohamed Samer, Omar Hijazi, Essam Abdelsalam, Jochen G. Wiecha, Kathrin L. M. Ziegler, Heinz Bernhardt) 1900100

11:00am Greenhouse Gas Emissions from Uganda’s Cattle Corridor Farming Systems • Presenting author: Nicholas Kiggundu, Makerere University, Kampala Uganda (Nicholas Kiggundu, Stanley Peter Ddungu, Joshua Wanyama, Denis Mpaiwre, Sam Cheroitch, Emmanuel Zziwa, Faizal Mutebi, Alessandra Faluccci) 1900418

11:15am Acidification of Outdoor Liquid Manure Storages Causes Long-Term GHG Reductions • Presenting author: Vera Sokolov, Wilfrid Laurier University and Agriculture and Agri-Food Canada,
Monday, July 8

11:30am Air Quality from Beef Manure from Steers Receiving Moderate or Aggressive Anabolic Steroid Implants • Presenting author: Mindy Spiehs, USDA-ARS, Clay Center, NE (Mindy J. Spiehs, Bryan L. Woodbury, Kristin E. Hales) 1901881

119 Emerging Information Systems for Animal Production Systems
Monday, July 8, 9:30am-12:00pm
Location: Orleans
Sponsored by: PAFS-40; ITSC-254
Moderator: Joshua Peschel, Iowa State University, Ames, IA

9:35am Individual Animal Identification in Beef Cattle Using Machine Learning • Presenting author: John M. Long, Oklahoma State University, Stillwater, OK (Yajun Chen, John Long, Ning Wang, Jordan Fischer) 1901489

9:50am Predict Beef Cattle Temperament Using Near-Infrared, Video, and Thermal Imaging Technologies • Presenting author: Xin Sun, North Dakota State University, Fargo, ND (Xin Sun, William Ogdahl) 1900425

10:05am Classification of Pig Stress Condition Using Paraconsistent Logic • Presenting author: Irenilza de Alencar Nääs, Paulista University, Sao Paulo Brazil (Jonas Silva, Jair M. Abe, Irenilza A. Nääs, Alexandre F. Cordeiro) 1901686

10:20am Automatic Prediction of Stress in Piglets Using Skin Temperature • Presenting author: Irenilza de Alencar Nääs, Paulista University, Sao Paulo Brazil (Felipe N. da Fonseca, Jair M. Abe, Irenilza de A. Nääs, Alexandre F. Cordeiro, Fabio V. Amaral) 1901688

10:35am BREAK

10:45am Image Processing for Analyzing Broiler Feeding and Drinking Behaviors • Presenting author: Guoming Li, Mississippi State University, Starkville, MS (Guoming Li, Yang Zhao, Daniel Chesser, John W. Lowe, Joseph L. Purswell) 1900165

11:00am On the Use of 3D Animations for Automated Livestock Behavior Characterization • Presenting author: Joshua Peschel, Iowa State University, Ames, IA (Joshua Peschel) 1901346

11:15am An Imaging System Based on Deep Learning for Monitoring the Feeding Behavior of Dairy Cows • Presenting author: Cheng Yu Kuan, Taipei Taiwan (Cheng-Yu Kuan, Yu-Chi Tsai, Jihtay Hsu, Shih-Torrng Ding, Ta-Te Lin) 1901469

11:30am Ranking of Environmental Heat Stressors for Dairy Cows Using Machine Learning Algorithms • Presenting author: Michael Gorczyca, Cornell University, Ithaca, NY (Kifle Gebremedhin) 1901495

11:45am Development of an Environmental Monitoring and Control System for Weaver Pig Houses • Presenting author: Yi-Chich Chiu, National Ilan University, Yi-Lan, Taiwan, ROC (Y. C. Chiu, P. W. Huang, Y. K. Lin, M. Y. Chang) 1900124

12:00pm A Holistic Precision Grass Measurement and Analysis System to Optimize Pasture Based Livestock Production • Presenting author: Darren J. Murphy, Walsh Fellow, Teagasc, Moorepark, Fermoy, Co. Cork, Ireland (Darren J Murphy, Bernadette O’Brien, Mohammad Sadegh Askari, Tim McCarthy, Aidan Magee, Rebekah Burke, Michael D Murphy) 1900769

120 Indoor Production of Cannabis and Other Medicinal Plants
Monday, July 8, 9:30am-12:00pm
Location: Falmouth
Sponsored by: PAFS-30
Moderator: Nadia Sabeh, Dr. Greenhouse, Sacramento, CA

9:35am Optimizing Drying Kinetics of Hops and Cannabis • Presenting author: Mark Lefsrud, McGill University, Hudson, QC Canada (Mark Lefsrud) 1901677

9:50am Different Wavelength Spectrum’s Effect on a THC/CBD Phenotype Cannabis Sativa’s Biomass, Cannabinoid Yield and Terpene Profile • Presenting author: Mark Lefsrud, McGill University, Hudson, QC Canada (Victorio Morello, Samuel Bilodeau, Mark Lefsrud) 1901888

10:05am Modeling Irradiance Levels of Horticultural Lighting Systems • Presenting author: Bo-Sen Wu, McGill University, Ste-Anne-de-Bellevue, Quebec Canada (Bo-Sen Wu, Mark Lefsrud) 1901383


10:35am BREAK

10:45am Power from Fertilizer Using an Osmosis Cell • Presenting author: Pouyan Pourmovahed, Oakland University, Rochester, MI (Jonathan Maisonneuve) 1901184

11:00am Climate Control for Cannabis: Unique Challenges for a Unique Crop • Presenting author: Nadia Sabeh, Dr. Greenhouse, Sacramento, CA (Nadia Sabeh) 1901915

11:15am Energy Efficient Desiccant Based System for Drying Agricultural Products • Presenting author: Irwin R. Donis-Gonzalez, University of California-Davis, Davis, CA (Irwin Donis Gonzalez) 1900922

11:30am Session Wrap Up: Research Challenges for Development of the Cannabis Industry

121 Biochemical Conversion Processes
Monday, July 8, 9:30am-12:00pm
Location: Boylston
Sponsored by: PRS-280; ES-220
Moderator: Catherine Brewer, New Mexico State University, Las Cruces, NM

9:35am Alcohol Production by New Syngas Fermenting Microorganisms • Presenting author: Hasan K. Atiyeh, Oklahoma State University, Stillwater, OK (Xiao Sun, Hasan K. Atiyeh, Raymond L. Huhnke, Ralph S. Tanner) 1900249

9:50am Production of Biodegradable Plastics from Organic Waste • Presenting author: Ke Wang, University of California, Davis, CA (Ke Wang, Shu Cai, Chang Chen, Julia Fan, Ruihong Zhang) 1900186

28 NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Monday, July 8

10:05am Valorization of Steam Explosion-Pretreated Biosolids for Value-Added Enzymatic Bioproducts • Presenting author: Can Liu, University of Kentucky, Lexington, KY (Can Liu, Zhi-Wu Wang, Jian Shi) 1900935

10:20am Exogeneous Efflux Pump Expression Increase Robustness Against Biomass Hydrolysates Inhibitors on Clostridium Fermentations • Presenting author: Pablo Jimenez-Bonilla, Auburn University, AL / Universidad Nacional, Heredia, Costa Rica (Pablo Jimenez-Bonilla, Jie Zhang, David Biersch, Yifen Wang, Luz Estela Gonzalez-de-Bashan, Yi Wang) 1900470

10:35am BREAK

10:45am Production of Chlorella Sorokiniana for Animal Feed Application Using Heterotrophic Cultivation • Presenting author: Allan Chio, UC Davis, Davis, CA (Tyler Barzee, Ruihong Zhang) 1901735

11:00am Suitability of Ensiled Biomass Sorghum as a Lignocellulosic Feedstock for Fermentable Sugar Production • Presenting author: Ana Zuleta-Correa, North Carolina State University, Raleigh, NC (Ana Zuleta-Correa, Edward E. Godfrey III, Matthew B. Whitfield, Mari S. Chinn) 1901484

11:15am Production of Fungal Biomass from Almond Hulls for Animal Feed Application • Presenting author: Lin Cao, University of California, Davis, Davis, CA (Lin Cao, Tyler Barzee, Yike Chen, Zhongli Pan, Ruihong Zhang) 1900911

11:30am Alkaline, Acid and Enzymatic Wet Milling Treatments to Improve the Extraction of Natural Rubber from Taraxacum kok-saghyz at Pilot Scale • Presenting author: David A. Ramirez-Cadavid, The Ohio State University, Wooster, OH (David A. Ramirez-Cadavid, Jesse Rossington, Frederick C. Michel) 1901187

11:45am Screening and Optimization of Ion Exchange Resins for Integration into Biochemical Fermentation System for Enhanced Production of Acetic Acid Using Acetogenic • Presenting author: Supriya C. Karekar, Washington State University, WA (Supriya C. Karekar, Keerthi Srinivas, Birgitte K. Ahring) 1901333

12:00pm Developing a Low-Cost and Scalable Bio-Catalytic Process for Targeted and Effective Insect Control • Presenting author: Karthikeyan Ramachandriya, GreenLight Biosciences, Inc, Medford, MA (Oscar Pardo Planas, Karthikeyan Ramachandriya, Himanshu Dhamankar, Ify Iwuchukwu, Ray Farmer, Elisha Fielding, Nicholas Skizim, James Abshire, Drew Cunningham, Thais Rodrigues, Suresh Desai, Douglas Boyes) 1901133

12:15pm Structural Characteration of Neutral/Anionic Glucans Produced by Rhizobium Radiobacter and Optimal Fermentation Strategies for Neutral Glucans Production • Presenting author: Hongtao Zhang, Wuxi, Jiangsu, China (Jingbin Yang, Hong-Tao Zhang) 1901411

12:20pm Development of Fish Filleting Machine for Rohu (Labeo rohita) Fish • Presenting author: Yuqiao Jin, Washington State University, Pullman, WA (Juming Tang) 1901411

9:35am Functional Properties of Size Fractionated Broken Rice Kernels Generated After Milling of Parboiled and Non-Parboiled Rice • Presenting author: Rebecca Bruce, University of Arkansas, Fayetteville, AR (Griffiths G. Atungulu) 1900082

9:50am Quality of Rough Rice Conveyed in an Eclectrically Heated Allothermal Auger System • Presenting author: Sammy Sadaka, University of Arkansas, Little Rock, AR (Kushik Luthra, John Magugu) 1900309

10:05am Extrusion for Value-Added Utilization of Spent Grain from Bourbon Distilling and Craft Beer Brewing • Presenting author: Akinbode A. Adeideji, University of Kentucky, Lexington, KY (Joseph Woomer Akinbode Adedeji) 1900335

10:20am Use of High Pressure Processing to Thaw Raw Poultry Meats • Presenting author: Mary-Grace Danao, University of Nebraska-Lincoln, Lincoln, NE (Ali Alqaraghull, Mary-Grace C. Danao, Curtis L. Weller, Joseph L. Baumert, Gary A. Sullivan) 1900462

10:35am BREAK

10:45am Efficacy of Ozone as Oxidant for Clarification and Disinfection of Sugarcane (Saccharum officinarum) Juice • Presenting author: Chirasmita Panigrahi, PhD scholar, IIT Kharagpur, Kharagpur, West Bengal India (Hari Niwas Mishra, Sirshendu De) 1900824

11:00am Computer Simulation Analyses of Improving Radio Frequency (RF) Heating Uniformity in Peanut Kernels for Pasteurization • Presenting author: Shuang Zhang, Northwest A&F University, Yangling, Shaanxi, China (Shuang Zhang, Lihui Zhang, Shaojin Wang) 1900475

NO-SHOW Development of Fish Filleting Machine for Rohu (Labeo rohita) Fish • Presenting author: Jayraj P., Research Scholar, Kharagpur, West Bengal, India (Jayraj P, Rajendra Machavaram) 1900409

123 Food Safety Engineering—HYBRID

Monday, July 8, 9:30am-12:00pm
Location: Columbus II
Sponsored by: PRS-703
Moderator: Steven Walker, US Food and Drug Administration, Bedford Park, IL

9:35am Improved Design of Aluminum Test Cell to Study the Thermal Resistance of Salmonella enterica and Enterococcus faecium in Low-Water Activity Food • Presenting author: Yuqiao Jin, Washington State University, Pullman, WA (Juming Tang) 1901411

9:50am Inactivation of Fungi on Food and Feed Ingredients Using Selective Infrared Heat Treatment • Presenting author: Shantae Wilson, University of Arkansas, Fayetteville, AR (Griffiths G. Atungulu, Abass A. Oduola) 1901859

10:05am Development of Simplified Method for Temperature Estimation of Microwave Assisted Pasteurization System (MAPS) Processing • Presenting author: Yoon-Ki Hong, Washington State University, Pullman, WA (Frank Liu, Zhongwei Tang, Ren Yang, Chandrashekar Sonar, Juming Tang) 1901458

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Monday, July 8

10:20am  Development of a Practical Cold Plasma Food Sanitation Processing System  •  Presenting author: Paul Weckler, Oklahoma State University, Stillwater, OK (Paul Weckler, Maria (Li) Ma, Tim Bowser, Sarah Riley, Derek Clinton, Nicholas Holden, Calvin Wynn)  1901549

10:35am  BREAK

10:45am  Degradation of Aflatoxin in Peanuts Using High Voltage Atmospheric Cold Plasma: Degradation Efficacy, Effect on Peanut Quality and Reduced Toxicity  •  Presenting author: Hu Shi, Iowa State University, Ames, IA (Kevin Keener)  1900581

11:00am  A Mechanistic Model of Plant Stomatal Defense against Bacterial Infiltration  •  Presenting author: Mohsen Ranjbaran, Cornell University, Ithaca, NY (Mohsen Ranjbaran, Ashim K. Datta)  1900383

11:15am  Understanding Water Activity change in Plant Oil with Temperature  •  Presenting author: Ren Yang, Washington State University, Pullman, WA (Ren Yang, Sicheng Sun, Jiewen Guan, Juming Tang)  1901280

11:30am  Water Activity Change of Egg Powders at Elevated Temperatures Modeled by Clausius Clapeyron Equation  •  Presenting author: Marco Esteban Pérez Reyes, Washington State University, Pullman, WA (Marco Esteban Pérez Reyes, Juming Tang, Mei-Jun Zhu, Gustavo Barbosa Cánovas)  1900674

11:45am  Curcumin and Quercetin as Potential Radioprotectors and/or Radiosensitizers for X-ray-based Sterilization of Male Navel Orangeworm Larvae  •  Presenting author: Peishih Liang, USDA-ARS Western Regional Research Center, Albany, CA (Ron Hoff, Inna Ovchinnikova, Douglas Light, Noreen Mahoney, Jong Kim)  1900096

12:00pm  Activated Release of Ethyl Formate for Active Packaging Applications of Fruits and Vegetables  •  Presenting author: Amr Zaitoon, University of Guelph, Guelph, Ontario, Canada (Amr Zaitoon, Cynthia Scott-Dupree, Loong-Tak Lim)  1900429

12:15pm  Microbial Diversity Changes on Crickets (Acheta domesticus) during Processing to Cricket Flour  •  Presenting author: Oliver Schlüter, Leibniz Inst. Agric. Eng. and Bioeconomy, Potsdam, Brandenburg Germany (Antje Fröhling, Sara Büßler, Julia Durek)  1901164

124 Modeling and Optimization in Food Processing and Storage

Monday, July 8, 9:30am-12:00pm
Location: Salon K
Sponsored by: PRS-703
Moderator: Satyanarayan Dev, Florida A&M University, Tallahassee, FL

9:35am  Combined Taguchi Orthogonal and Box-Behnken Optimization of Pre-Cooked Beans Processing Conditions  •  Presenting author: Ebenezer Kwofie, McGill University, Ste Anne-de-Bellevue, Quebec Canada (Ebenezer Kwofie, Ogan Mba, Michael Ngadi)  1901791

9:50am  Modeling Moisture Movement Characteristics in Rough Rice Subjected to Chilling Environment  •  Presenting author: Soraya Shafiekhan, University of Arkansas, Fayetteville, AR (Soraya Shafiekhan, Griffiths Atungulu)  1901858

10:05am  Modeling of the Heat and Moisture Transfer in a Multipurpose Solar Dryer  •  Presenting author: Diana Ramirez, Purdue University, West Lafayette, IN (Diana M Ramirez Gutierrez, Klein E. llele)  1901241

10:20am  Probit or Logit? Which Best GLM Model Represents Prediction of Longevity in Soybean Seeds  •  Presenting author: Rute Queilha de Faria, IFGoiano, Urutai, GO, Brazil (Amanda Rithieli Pereira dos Santos, Deoclecio Jardim Amorim, Renato Fernandes Cantão, Edualdo Aparecido Amaral da Silva, Maria Márcia Pereira Sartori)  1900558

10:35am  BREAK

10:45am  Inverse Heat Method to Estimate the Heat Flux in Bread Baking  •  Presenting author: Ashis. K. Datta, Agricultural and Food Engineering Department, Indian Institute of Technology Kharagpur, West Bengal India (A. K. Datta)  1900880

NO-SHOW  Based on the Hybrid Model of Loquat Fruit Mature wveannanism Research  •  Presenting author: Lu Zhoumin, Northwest A&F University, Xian, Shaanxi China (Yang Peihua)  1900486

11:15am  Effects of Particle Shape and Size on Discrete Element Method Simulation of Wheat Bulk Density  •  Presenting author: Marvin C. Petingco, Kansas State University, Manhattan, KS (Marvin C. Petingco, Mark E. Casada, Ronaldo G. Maghirang, Kingsly Ambrose, Oladiran O. Fasina)  1901636

11:30am  A Model of Factors Influencing Grain Traceability Characteristics  •  Presenting author: Heather H. Tenboer, Iowa State University, Ames, IA (Heather H. Tenboer, Gretchen Mosher, Charles Hurburgh)  1900594

11:45am  Dynamic Vapour Sorption Isotherms of Small Cardamom (Elettaria cardamomum Maton)  •  Presenting author: Sushreesmita Mishra, Indian Institute of Technology Delhi, New Delhi India (Sushreesmita Mishra, Jatindra Kumar Sahu)  1901811

125 Sustainable Food-Water-Energy Nexus
Monday, July 8, 2:30pm-5:00pm
Location: Salon H
Sponsored by: E-2050; AABFEIO
Moderator: Aavudai Anandhi, Florida A&M University, Tallahassee, FL

2:35pm  Role of Engineering for Sustainable Food-Water-Energy Nexus in India  •  Presenting author: Indra Mani, Indian Society of Agricultural Engineers, New Delhi, India  1901947

3:05pm  Managing Irrigation-Induced Soil Salinity and Waterlogging for Achieving Water and food security—Experiences from Andhra Pradesh, India  •  Presenting author: Srinivasulu Ale, Texas A&M AgriLife Research, Vernon, TX (Raghu Babu Movva, Yella Reddy Kaluvai, Satyanarayana Tammineedi)  1901948

3:35pm  BREAK

3:45pm  Sustainable Food-Water-Energy Nexus—Potential Options in Indian Context  •  Presenting author: Dharmendra

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Monday, July 8

2:50pm  **Techno-Economic Analysis for a Commercial Scale Rotary Shear System**  
**Presenting author:** David Lanning, Forest Concepts LLC, Auburn, WA (Neal Yancey, Damon Hartley, James Dooley) 190204

3:05pm  **Development of a Process Simulation Model for a Forest Biomass Torrefaction and Densification Plant**  
**Presenting author:** Kamalakanta Sahoo, Forest Products Laboratory, Madison, WI (Maryam Manouchehrinejad, Kamalakanta Sahoo, Sudhagar Mani) 1901783

3:20pm  **High Pressure Treatment to Enhance Poplar Wood Permeability Characteristics**  
**Presenting author:** Kaushlendra Singh, Zhejiang University, Hangzhou, Zhejiang, China (Kaiya Yan, Aqiang Li, Huanhuan Li, H.S. Ramaswamy, Yong Yu, Songming Zhu, Lihui hu) 1900652

3:35pm  **BREAK**

3:45pm  **Investigation of the Use of Micronized Rubber Powder in Wood-Based Composite Particleboard**  
**Presenting author:** John Cole, Mississippi State University, Starkville, MS (John Cole, Jason Street) 1900451

4:00pm  **Poplar as a Biofiber Reinforcement in Composites for 3D Printing**  
**Presenting author:** Xianhui Zhao, Oak Ridge National Laboratory, Oak Ridge, TN (Xianhui Zhao, Kai Li, Yu Wang, Halil Tekinalp, Erin Webb, Tim Theiss, Soydan Ozcan) 1901279

4:15pm  **Effect of Bamboo Particles Treated with Different Concentration of NaOH Solutions on Properties of PLA/BP Composites**  
**Presenting author:** Yue Liang, Zhejiang University, Hangzhou China (Yue Liang, Shen Zhang, Ximing Zhang, Hongjian Lin, Xiangyun Qian, Kuichuan Sheng) 1900931

4:30pm  **Cellulose-Based Polymer Nanohybrids and Their Emerging Applications**  
**Presenting author:** Ki-Taek Lim, Kangwon National University, Chuncheon, Gangwon, Republic of Korea (Ki-Taek Lim) 1901417

4:45pm  **Corn Distiller’s Dried Grains with Solubles (DDGS)—A Functional Material for Binderless Particleboards**  
**Presenting author:** Dilpreet Bajwa, North Dakota State University, Fargo, ND (Dilpreet S. Bajwa, Joshua D. Liaw, Sreekala G. Bajwa) 1901928

**128 The Future of Ag Systems Management & Technology Programs—RAP**

Monday, July 8, 2:30pm-5:00pm

**Location:** Salon J

**Sponsored by:** EOPD 205; EOPD 206

**Moderator:** Deepak Keshwani, University of Nebraska, Lincoln, NE; Tom Brumm, Iowa State University, Ames, IA

**Do you teach in Ag Systems Management or Technology programs? Are you a department head or program coordinator for these programs? Does your company hire graduates from Ag Systems Management and Technology Programs? If so, join us to discuss the future of Ag Systems Management and Technology Programs. This session will be a moderated RAP discussion to identify challenges and opportunities for our programs. Discussion topics will include emerging career pathways, student recruitment, faculty development, new curriculum needs and**
Monday, July 8

**129 Advanced and Drop-In Biofuels Production—Biochemical Approach**

Monday, July 8, 2:30pm-5:00pm

Location: Harvard

Sponsored by: ES-220; PRS-280

Moderator: Yi Wang, Auburn University, Auburn, AL

2:35pm **Enhanced Acetone-Butanol-Ethanol Production by Clostridium beijerinckii Using Biochar**  
Presenting author: Xiao Sun, Oklahoma State University, Stillwater, OK (Xiao Sun, Hasan K. Atiyeh, Yin A. Adesanya, Haillin Zhang, Christopher Okonkwo, Thaddeus Ezeji) 1900256

2:50pm **Exploring Polycationic Surfaces on the Cell Adsorption Immobilization for Acetone-Butanol-Ethanol (ABE) Fermentation**  
Presenting author: Pablo Jimenez-Bonilla, Auburn University, AL / Universidad Nacional, Heredia, Costa Rica (Pablo Jimenez-Bonilla, David Biersch, Yifen Wang, Luz Estela Gonzalez-de-Bashan, Yi Wang) 1901567

**NO-SHOW** **Production of Corn Ethanol and Lignocellulosic Ethanol using horizontal Reactors: Experimental Comparison and Techno Economic Analysis**  
Presenting author: Haider Kadhum, Oregon State University, Corvallis, OR (Haider J. Kadhum, G. S. Murthy) 1900460

3:05pm **Enhanced Biogas Yield in Anaerobic Sequencing Batch Reactors Using a Cationic Polymer**  
Presenting author: Pius Ndegwa, Washington State University, Pullman, WA (Iftikhar Zeb, Gopi K. Kafle, Xiaoyun Xue) 1901822

3:35pm **BREAK**

3:45pm **Study of Chemical Composition and Fuel Properties of Alternative Jet Fuels**  
Presenting author: Anamaria Paiva Pinheiro Pires, Washington State University, Pullman, WA (Anamaria Paiva Pinheiro Pires, Yinglei Han, John Kramlich, Manuel Garcia-Perez) 1900023

4:00pm **Physical-Chemical Characterization of Cotton Oil Biodiesel for Use in Agricultural Diesel Engines**  
Presenting author: Ronald Leite Barbosa, Instituto Federal de Minas Gerais IFMG, Belo Horizonte, MG (Ronald Leite Barbosa) 1900180

**NO-SHOW** **Impact of Polypyrrole Magnetic (PPy-Fe3O4) Nanocomposite Additive on Anaerobic Digestion of Okra Waste**  
Presenting author: Ugwu Samson Nnaemeka, University of South Africa, Johannesburg South Africa (Ugwu Samson Nnaemeka Enweremadu Christopher Chintua) 1901066

**NO-SHOW** **Improvement of Anaerobic Digestions of African Typha with Rumen Fluid**  
Presenting author: Mohammed Othman, NAERLS, Ahmadu Bello University, Zaria, Kaduna Nigeria (Nura Sale, R. Kohn, M. K. Othman) 1901065

4:45pm **Ganulation of Clostridium beijerinckii P260 in Continuous Flow Reactors Converting Food Waste to Butanol Simultaneously Recovered through Pervaporation**  
Presenting author: Marie Qian, WSU-Tricities, Richland, WA (Marique Qian, Hanwu Lei, Elmar Villota, Wendy Mateo, Dengle Duan, Yunfeng Zhao) 1900904

5:00pm **Butanol Production from Non-Detoxified Switchgrass Hydrolysate Using New Inhibitor Tolerant Strains of Clostridium beijerinckii**  
Presenting author: Yin A. Adesanya, Oklahoma State University, Stillwater, OK (Yinka A. Adesanya, Hasan K. Atiyeh, Xiao Sun, Christopher Okonkwo, Vitor Ujor, Thaddeus Ezeji) 1900257

5:15pm **Purification and Biochemical Characterization of Aryl Alcohol Oxidase and Lignin Peroxidase: Lignin-Degrading Enzymes Produced by Engineered Aspergillus nidulans**  
Presenting author: Enshi Liu, University of Nebraska-Lincoln, Lincoln, NE (Enshi Liu, Fernando Segato, Rolf A. Prade, Mark R. Wilkins) 1900566

**130 Thermochemical Conversions of Biomass**

Monday, July 8, 2:30pm-5:00pm

Location: Brandeis

Sponsored by: ES-220

Moderator: Sandun Fernando, Texas A&M University, College Station, TX

2:35pm **Production and Recovery of Levogluconan by Extraction of Cotton-Based Textile-Waste-Pyrolysis Oil**  
Presenting author: Anamaria Paiva Pinheiro Pires, Washington State University, Pullman, WA (Anamaria Paiva Pinheiro Pires, Yinglei Han, John Kramlich, Manuel Garcia-Perez) 1900025

2:50pm **Recovering Valuable Bioactive Compounds from Potato Peels via Sequential Hydrothermal Extraction**  
Presenting author: Jose S. Martinez-Fernandez, Washington State University, Pullman, WA (Ayca Seker, Maryam Davaritouchaee, Shulin Chen) 1900017

3:05pm **Catalytic Fast Co-Pyrolysis of Biomass and Plastic over Sulfonated Carbon-based Catalyst**  
Presenting author: Wendy Mateo, Washington State University, Richland, WA (Hanwu Lei, Elmar Villota, Marie Qian, Dengle Duan, Yunfeng Zhao) 1900621

3:20pm **Co-Hydrothermal Carbonization of Coal Refuse and Food Waste Blend**  
Presenting author: M. Toufiq Reza, Ohio University, Athens, OH (Shanta Mazumder, Kyle McGaughy, Pretom Saha, M. Toufiq Reza) 1900904

3:35pm **BREAK**

3:45pm **Hydrothermal Liquefaction of Food Waste: Bio-Crude Oil Characterization, Mass and Energy Balance**  
Presenting author: Hengameh Bayat, New Mexico State University, Las Cruces, NM (Hengameh Bayat, Feng Cheng, Mostafa Dehghanizadeh, Nicholas Soliz, Catherine E. Brewer, Umakanta Jena) 1900974

4:00pm **Wet Air Oxidation Using Nitrogen Doped Cellulose Char Catalyst to Treat Phenol Contaminated Water Effluent**  
Presenting author: Iva Tews, Washington State University, Pullman, WA (Iva Tews, Micahel A. A. Apasiku, Sohrab Haghighi Mood, Kalidas Mainali, Manuel Garcia-Perez) 1901302

4:15pm **Enhancement of Aromatic Hydrocarbons from Co-Feeding of Lignocellulosic Biomass with Plastics over Hierarchical Zeolites**  
Presenting author: Marie Qian, WSU-Tricities, Richland, WA (Marique Qian, Hanwu Lei, Elmar Villota, Wendy Mateo, Dengle Duan, Yunfeng Zhao) 1900881
Monday, July 8

131 Advanced Computational Approaches for Solving Agricultural and Biological Engineering Problems
Monday, July 8, 2:30pm-5:00pm
Location: Northeastern
Sponsored by: ITSC-217; NRES-244; NRES-265; ITSC-230
Moderator: Nourredine Abdoulmoumine, University of Tennessee, Knoxville, TN

2:35pm  Quantifying Complex Farmer-Decision Making in Agent Based Models  Presenting author: Kendra Zeman, University of Illinois, Urbana, IL (Kendra Zeman, Luis F. Rodriguez) 1901666

2:50pm  Design of a Comprehensive Fuzzy and Neural Network Scheme for Harvest and Growth Quality Estimation of Lettuce  Presenting author: Chung-Liang Chang, Department of Biomechatronics Engineering, National Pingtung University of Science and Technology, Pingtung County, Taiwan R.O.C. (Wei-Lun Fu, Cheng-Chieh Huang) 1900276

3:05pm  A Computational Approach to Determine the Parameters that Influence Maize Stem Buckling Failure  Presenting author: Christopher J Stubb, New York University, New York, NY (Christopher J Stubb, Ryan Larson, Douglas D Cook) 1900260

3:20pm  Compact Codes for Advanced Computations  Presenting author: Hubert Montas, University of Maryland, College Park, MD (Hubert Montas, Jonathan Resop) 1901371

3:35pm  Break

3:45pm  Assessing the Impacts of Climate Change on Rice Yield in the Artibonite Valley of Haiti Using DSSAT CERES-Rice Crop Model  Presenting author: Floyld Nicolas, Agricultural and Biological Engineering Department, University of Florida, Gainesville, FL (K.W. Migliaccio, G. Hoogenboom, W. R. Eisenstadt, B. Rathinasabapathy) 1900914

4:00pm  Combining Machine Learning with Mechanistic Models to Predict Body Temperatures of Piglets  Presenting author: Hugo Milan, Cornell University, Ithaca, NY (Kifle Gebremedhin) 1900431

4:15pm  Stochastic Optimization in the Survival Analysis Setting  Presenting author: Michael Gorczyca, Cornell University, Ithaca, NY (Kifle Gebremedhin) 1901497

4:30pm  Prediction of Radiation Frost Using Support Vector Machine Based on Micrometeorological Data  Presenting author: Yongzong Lu, University of California Agriculture and Natural Resources (UCANR), UCCE Imperial County, Holtville, CA (Yongzong Lu, Yongguang Hu, Richard L. Snyder, Kyaw Tha Paw U, Huan Song) 1900519

4:45pm  Application of Finite Element Method to Estimate the Bruise Damage of Kiwifruit under Drop Impact Loading  Presenting author: Dongdong Du, Zhejiang University, Hangzhou, Zhejiang, PR China (Dongdong Du, Jun Wang, Bo Wang, Fuqiang Yao) 1900242

132 Imaging Technologies for High Throughput Phenotyping Part II
Monday, July 8, 2:30pm-5:00pm
Location: Tufts
Sponsored by: ITSC-312; MS-48; ITSC-348
Moderator: Haiyan Cen, Zhejiang University, Hangzhou, Zhejiang China

2:35pm  Geospatial Assessment of Phenotype Predictive Analytics Using Machine Learning Techniques  Presenting author: Parisa Sarzaeim, University of Nebraska-Lincoln, Lincoln, NE (Parisa Sarzaeim, Francisco Munoz-Arriola, Alessandro Amaranto, Diego Jarquin, Denise Bradford) 1901655

2:50pm  Deep Convolutional Neural Network to Characterize Flowering Dynamics of Angiosperms  Presenting author: Yu Jiang, The University of Georgia, Athens, GA (Rui Xu, Rikki Brown, Shangpeng Sun, Liujun Li, Jon Robertson, Piyush Pandey, Changyìng Li, Andrew Paterson) 1901225

3:05pm  Development of a Low-cost and Minimally Invasive Root Phenotyping System  Presenting author: Zhihang Song, Purdue University, West Lafayette, IN (Zhihang Song, Jian Jin) 1900948

3:20pm  Trait Evaluation of Cool-Season Crops Using High-Throughput Phenotyping Technologies  Presenting author: Chongyuan Zhang, Department of Biological Systems Engineering, Washington State University, Pullman, WA (Wilson Craine, Rebecca McGee, George Vandemark, James B. Davis, Jack Brown, Scot H. Hulbert, Sünduha Sankaran) 1901201

3:35pm  Break

3:45pm  Visualizing Roots In Situ: Development of a Field Deployable Low-Field Magnetic Resonance Imaging Rhizotron  Presenting author: G. Cody Bagnall, Texas A&M University, College Station, TX (Cristine L. Morgan, Matthew Rosen, Einichi Fukushima, Karl Stupic, Stephen Altobelli, Mark Conradi, Dean Keuthe, William L. Rooney, John E. Mullet, James L. Heilman) 1901147

4:00pm  Development of an Automated Multi-Sensor System for High-Throughput Phenotyping in Greenhouse Environment  Presenting author: Tanzeel Rehman, Purdue University, West Lafayette, IN (Tanzeel Rehman, Jian Jin) 1901098

4:15pm  Deep Neural Networks for Aphidomycetes Root Rot Severity in Lentil  Presenting author: Aref Marzougui, Department of Biological Systems Engineering, Washington State University, Pullman, WA (Yu Ma, Rebecca McGee, Sünduha Sankaran) 1901209

4:30pm  Image Processing for High Throughput Phenotyping in Plant Breeding  Presenting author: James Kim, Arid-Land Agricultural Research Center, Maricopa, AZ (James Y Kim, John Dyer) 1901885

4:45pm  Deriving Vegetation Indices from High-Throughput Images by Using Unmanned Aerial Systems in Soybean Breeding  Presenting author: Beichen Lyu, Department of Agricultural & Biological Engineering, Purdue University, West Lafayette, IN (Beichen Lyu, Stuart D. Smith, Xuyang Xue, Keith A. Chekroun) 1900279
5:00pm  Individual Citrus Tree Phenotyping Using Unmanned Aerial System (UAS)  •  Presenting author: Anjin Chang, Texas A&M University, Corpus Christi, TX (Anjin Chang, Jinhua Jung, Sungchan Oh, Junho Yeom, Akash Ashapure, Murilo Maeda, Juan Landivar) 1901513

5:15pm  Field-Based High-Throughput Phenotyping for Maize Plant Using 3D LiDAR Point Cloud Generated with a “Phenomobile”  •  Presenting author: Quan Qiu, Beijing Research Center of Intelligent Equipment for Agriculture, Beijing, Beijing, China (Quan Qiu, Na Sun, He Bai, Ning Wang, Yanjun Wang, Zhengqiang Fan, Zhijun Meng, Bin Li, Yue Cong) 1901763

**133 Machine Vision Applications in Agriculture and Food**
Monday, July 8, 2:30pm-6:00pm
Location: Tremont
Sponsored by: ITSC-312
Moderator: Yan-Fu Kuo, National Taiwan University, Taipei, Taiwan China

2:35pm  Counting Bacterial Colony on Agar Plates Using Deep Convolutional Neural Network  •  Presenting author: Hong-ye Lin, Department of Bio-Industrial Mechatronics Engineering, National Taiwan University, Taipei, Taiwan (Szu-Yu Chen, Chia-Lin Chung, Yan-Fu Kuo) 1900485

2:50pm  Quantifying Color and Textural Patterns of Petals and Studying their Association with Pollinators: Using Genus Sinningia (GESNERIACEAE) as an Example  •  Presenting author: Tzu-Ting Hung, National Taiwan University, Taipei Taiwan (Tzu-Ting Hung, Hao-Chun Hsu, Yan-Fu Kuo) 1900443

3:05pm  Real-Time Monitoring of Fluidized Bed Drying Using Computer Vision  •  Presenting author: Anthony Iheonye, Department of Bioresource Engineering, McGill University, Ste-Anne-de-Bellevue, Quebec, Canada (Yvan Gariepy, Vijaya Raghavan) 1901626

3:20pm  Development of an Image-Based Food Recognition and Nutritional Status Evaluation System  •  Presenting author: Babatunde Onadipe, McGill University, Sainte Anne De Bellevue, Quebec Canada (Michael Ngadi, Ebenezer Kwofie) 1901738

3:35pm  BREAK

**NO-SHOW**  Development of an Algorithm for the Periodic Leaf Movement Analysis of Arabidopsis Plants  •  Presenting author: Tanzeel Rehman, Purdue University, West Lafayette, IN (Tanzeel Rehman, Jian Jin) 1901122

4:00pm  Morphometric and Colorimetric Evaluation of Paddy during Parboiling Using Image Analysis  •  Presenting author: Ashish Kumar Datta, Agricultural and Food Engineering Department, Indian Institute of Technology, Kharagpur, West Bengal, India (Brajesh Kumar Panda, Shanker Lal Shrivastava, Ashish Kumar Datta) 1900984


4:30pm  Experimental and Numerical Investigations on Breakup Characteristics of Low-Pressure Jet with Different Nozzle Parameters  •  Presenting author: Yue Jiang, Jiangsu University, Zhenjiang, Jiangsu China (Yue Jiang, Hong Li, Daming Zhang, Lin Hua) 1900455

4:45pm  Particle Flow Estimation Using High-speed Camera and Optical Flow Method  •  Presenting author: Mehari Tekeste, Iowa State University, Ames, IA (Mohammad Mousaviraad, Mehari Tekeste, Joshua Peschel) 1901670

5:00pm  Crop Damage Detection from UAS Imagery and Using Deep Learning and Computer Vision Techniques  •  Presenting author: Ali Hamidisepehr, NC State University, Raleigh, NC (Ali Hamidisepehr, Jason Ward) 1900563

**NO-SHOW**  Application of Hyperspectral Reflectance Imaging and Deep Convolutional Neural Network to Discriminate the Variety of Corn Seed  •  Presenting author: Jun Zhang, Zhejiang University, Hangzhou, Zhejiang Province China (Limin Dai, Zhilin Zhao, Fang Cheng) 1901428

5:30pm  Determination of Pigment Contents in Cotton Leaves in Response to Verticillium Wilt Using Hyperspectral Imaging Combined with Deep Learning Model  •  Presenting author: Na Wu, Zhejiang University, Hangzhou China (Na Wu, Chu Zhang, Yong He, Chunxiao Mi) 1900514

5:45pm  Robotic Imaging-Based Methods for Leaf Segmentation and Growth Tracking in Arabidopsis  •  Presenting author: Lirong Xiang, Iowa State University, Ames, IA (Lirong Xiang, Yin Bao, Trevor Nolan, Lie Tang) 1901064

**134 Material and Molecular Innovations for Chemical and Biological Sensing**
Monday, July 8, 2:30pm-5:00pm
Location: Vineyard
Sponsored by: ITSC
Moderator: Mei He, University of Kansas, Lawrence, KS

**NO-SHOW**  Flexible Carbon Circuits Decorated with Nanoparticles Derived from Landfill Waste for Measuring Small Molecules and Bacteria  •  Presenting author: Eric McLamore, University of Florida, Gainesville, FL (Sabah Abdelbasir, Victoria Morgan, Hannah Schmidt, Enoch Kuo, Eric McLamore) 1901759

2:50pm  The Effect of Thermal Oxidation on the Performance of Nanostructured Porous Si Optical Biosensors  •  Presenting author: Giorgi Shitenberg, Institute of Agricultural Engineering, ARO, the Volcani Center, Bet Dagan, Israel (Giorgi Shitenberg) 1900265

3:05pm  Study of Rapid Detection Method of Thiabendazole Pesticide Residue in Fresh Tea Using Surface-Enhanced Raman Spectroscopy  •  Presenting author: Lei Lin, Zhejiang University, Hangzhou, Zhejiang Province, China (Lei Lin, Jianzhong Ma, Pengcheng Nie) 1900709

**NO-SHOW**  DNA Directed Immobilization as a Tool for Design of Porous Si Based Biosensors  •  Presenting author: Giorgi Shitenberg, Institute of Agricultural Engineering, ARO, the Volcani Center, Bet Dagan, Israel (Giorgi Shitenberg) 1900266

3:35pm  BREAK

3:45pm  An On-Site Fully Integrated Suitcase for Candidatus Liberibacter Asiaticus Detection Based on Loop-Mediated
Monday, July 8

**Isothermal Amplification** • Presenting author: Cui Wu, Zhejiang University, Hangzhou, Zhejiang Province China (Cui Wu, Zhen Wang, Hui Wu, Zhan Lu, Cheng Qian, Shunfu Jin, Rui Wang, Zunzhong Ye, Jian Wu, Yibin Ying) 1901001

4:00pm **Real-Time Single Nucleotide Polymorphism (SNP) Genotyping Using a RNase-H Loop-Mediated Isothermal Amplification (rh-LAMP) System** • Presenting author: Lena Diaz, University of Hawaii, Honolulu, HI (Daniel Jenkins, Ryo Kubota) 1901570

4:15pm **Enhanced Sensitivity in Terahertz Sensing with Nanomaterials** • Presenting author: Ruoyun Zhou, Zhejiang University, Hangzhou, Zhejiang China (Ruoyun Zhou, Chen Wang, Wendaou Xu, Lijuan Xie) 1900770

4:30pm **Rapid Detection and Classification of Fungi Contamination in Rice Grains Based on Electronic Nose with Chemometrics** • Presenting author: Shuang Gu, Zhejiang University, Hangzhou China (Shuang Gu, Jun Wang) 1900507

4:45pm **A Novel Feature Selection Framework for Analyzing E-Nose Data: Application to Evaluate the Quality of Chinese Dry-Cured Ham** • Presenting author: Kang Qian, Zhejiang University, Hangzhou, Zhejiang Province China (Kang Qian, Chenyuan Wu, Jiaqing Zhang, Changqin Chen, Zhenbo Wei) 1900680

5:00pm **3D Printed Auto-Mixing Chip Enables Rapid Smartphone Diagnosis of Anemia** • Presenting author: Mei He, University of Kansas, Lawrence, KS (Mei He) 1901365

5:15pm **Biomarker Detection for High-Throughout Sensing of Soft Rot Disease Detection in Stored Potatoes** • Presenting author: Worasit Sangjan, Washington State University, Pullman, WA (Worasit Sangjan, Afef Marzougui, Lav R. Khot, Brenda Schroeder, Sindhuja Sankaran) 1901406

135 Sensors and Control Systems for Precision Agricultural Equipment

Monday, July 8, 2:30pm-5:00pm
Location: Clarendon
Sponsored by: ITSC
Moderator: Aaron Franzen, South Dakota State University, Brookings, SD

2:35pm **Potential of Cyber-Physical Systems in German Dairy Farming** • Presenting author: Martin Hoehendinger, University of Applied Sciences Weihenstephan-Triesdorf, Technichal University of Munich, Freising, Bavaria, Germany (Martin Höhendinger, Natascha Schlereth, Maximilian Treiber, Manfred Höld, Jörn Stumpenhausen, Heinz Bernhardt) 1900221

2:50pm **Design and Test on Orchard Air-Assisted Variable Rate Sprayer** • Presenting author: Jixin, Jiangsu University, China (Ji Xin, Li Lin, Wang Aichen, Wei Xinhua) 1900370

3:05pm **Development of Tractor Power Output Wireless Detection System Based on Virtual Instrument Technology** • Presenting author: Dong Dai, Sun China Agricultural University, Beijing China (Dong Dai, Dong Sun, Shumao Wang, Ling Wang, Yu Wang) 1901569

3:20pm **Sensor for Concentration Monitoring at the Nozzle in Direct Injection Sprayer Systems** • Presenting author: Joseph Dvorak, University of Kentucky, Lexington, KY (Navab Karimi, Joseph Dvorak, Joseph Rounsaville, Tim Stombaugh) 1901695

3:35pm **BREAK**

3:45pm **Fabrication and Evaluation of a Low-Cost WiFi Soil Moisture Sensor** • Presenting author: Kaelin Saul, North Carolina State University, Raleigh, NC (Jason Ward) 1901823

4:00pm **Development of an Open Source Linux Based Operating System for Agricultural Equipment** • Presenting author: Paul Thieme, Purdue University, West Lafayette, IN (Dennis Buckmaster, James Krogmeier) 1901810

**136 Machinery Data and Task Optimization**

Monday, July 8, 2:30pm-5:00pm
Location: Berkeley
Sponsored by: MS-49; MS-45
Moderator: Brian Luck, University of Wisconsin-Madison, Madison, WI

**NO-SHOW**

**Function Analysis and Optimization of Chassis Frame for Sideage Harvester** • Presenting author: Zhang, Zhen, China Agricultural University, Beijing, Haidian District China (Zhang Zhen, Chi Ruijuan, Zhang Xueling, Du Yuefeng, Zhu Zhongxiang, Zhang Yubai) 1901437

2:50pm **Wild Blueberry Harvest Efficiency of Traditional Small Box and Semi-Automated Bin Handling Systems** • Presenting author: Ahmad Hannibah Khan, Department of Business and Social Sciences, Dalhousie University, Truro, Nova Scotia, Canada (Ahmad Khan, Emmanuel Yiridoe, Travis Esau, Qamar Zaman, Aitazaz Farooque, Prosper Koto) 1900837

3:05pm **Analysis of Traction Performance for an Agricultural Tractor According to Soil Moisture Content during Plow Tillage** • Presenting author: Wansoo Kim, Chungnam National University, Daejeon, South Korea (Wansoo Kim, Yong-Joo Kim, Seong-Un Park, Kyu-Chul Nam, Chang-Hyun Choi) 1900994

3:20pm **Yield Loss and Grade Effects of Peanut Combine Speed Settings** • Presenting author: Benjamin Fogle, Clemson University, Blackville, SC (Benjamin B. Fogle, Kendall Kirk, Warren White, Josey Peele, Dan Anco, Nathan Smith, Michael Plumblee) 1901725

3:35pm **BREAK**

**NO-SHOW**

**Design and Experimental Optimization of Cleaning System for Peanut Harvester** • Presenting author: Shengsheng Wang, Henan University of Science and Technology, Luoyang, Henan, China (Jiangtao Ji, Xin Jin, Lingxin Geng) 1900513

4:00pm **Power and Torque Curves of a Diesel Engine Fueled with Diesel and Soybean Oil Biodiesel Mixtures** • Presenting author: Ronald Leite Barbosa, Instituto Federal de Minas Gerais IFMG, Betim, Minas Gerais, Brazil (Ronald Leite Barbosa, Carlos Eduardo Silva Volpato, Diego José Carvalho Alonso, Fábio Moreira da Silva) 1901525

4:15pm **Test of a Diesel Cycle Engine Fueled with Different Proportions of Cotton Oil Biodiesel and Diesel** • Presenting author: Ronald Leite Barbosa, Instituto Federal de Minas Gerais IFMG, Betim, Minas Gerais, Brazil (Geovani Laurindo, Carlos Eduardo Silva Volpato, Pedro Castro Neto, Jackson Barbosa, Ronald Leite Barbosa) 1900381

**NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.**
### Monday, July 8

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<tr>
<td>4:30pm</td>
<td>Development of Simulation Model for Electric All-Wheel-Drive Tractor</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Seung-Min Baek, Chungnam National University, Daejeon, Republic of Korea (Seung-yun Baek, Yeon-Jun Jung, Md Abu Ayub Siddique, Kyu-Chul Nam, Tae-Bum Kim, Chang-Hyun Choi, Yong-Joo Kim) 1900992</td>
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<tr>
<td>4:45pm</td>
<td>Measurement of Temperature and Pressure in the Biomass Pelletizing Process</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Yiming Li, FMC Stine Research Center, Newark, DE (Yiming Li, Hojae Yi, Daniel Ciołkosz, Virendra M. Puri) 1901409</td>
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<tr>
<td>5:00pm</td>
<td>Strength Analysis for Hydraulic Mechanical Transmission of Agricultural Tractor Using Romax Designer</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Seung-Min Baek, Chungnam National University, Daejeon, Republic of Korea (Seung-Min Baek, Dae-Hyun Lee, Md Abu Ayub Siddique, Kyu-Chul Nam, Tae-Bum Kim, Chang-Hyun Choi, Yong-Joo Kim) 1901025</td>
</tr>
<tr>
<td>5:15pm</td>
<td>Analysis of Transmission Error for Compound Planetary Gear Reducer by Tooth Profile Modification</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Nam-Gyu Lee, Chungnam National University, Daejeon, Republic of Korea (Dae-Hyun Lee, Yeon-Jun Jung, Md Abu Ayub Siddique, Kyu-Chul Nam, Tae-Bum Kim, Chang-Hyun Choi, Yong-Joo Kim) 1901030</td>
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<tr>
<td>5:30pm</td>
<td>Development and Validation of Simulation Model for Three Point-Hitch during Agricultural Operation</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Hyeon-Ho Jeon, Yu-Seong Gu, Dae-ejon, Republic of Korea (Yeong-Jun Jung, Md Abu Ayub Siddique, Kyu-Chul Nam, Tae-Bum Kim, Chang-Hyun Choi, Yong-Joo Kim) 1901032</td>
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<tr>
<td>6:00pm</td>
<td>137 Precision Aerial Spray Applications: UAV/Drones and Manned Aircraft</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Randy Price, LSU AgCenter, Alexandria, LA (Randy Price) 1901547</td>
</tr>
<tr>
<td>6:15pm</td>
<td>Chemical Spraying Using Unmanned Aerial Vehicle Technology in Wetland Rice Cultivation in Malaysia</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Azmi Yahya, Universiti Putra Malaysia, Serdang, Selangor D.E., Malaysia (Azmi Yahya, Ahmad Suhaiiz Mat Su, Norhayu Asib, Anas Mohd Mustafah) 1901854</td>
</tr>
<tr>
<td>6:30pm</td>
<td>Development of a Tethered UAV Sprayer</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Paul Weckler, Oklahoma State University, Stillwater, OK (Paul Weckler, John Long, Ning Wang, Bryce Randall, Spencer Hayward, Matthew Snell, Charles Ruf) 1901548</td>
</tr>
<tr>
<td>7:00pm</td>
<td>Site Specific Weed Management Mapping System Using Unmanned Aerial Vehicle (UAV)</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Bruen Smith, University of Southern Queensland, Toowoomba, Queensland Australia (Bruen Smith, Livia Faria Defeo, Troy Jensen) 1900207</td>
</tr>
<tr>
<td>7:15pm</td>
<td>Agricultural Technology Adoption Path of Kansas Farms</td>
<td>USDA-ARS, College Station, TX; Raleigh, NC (Gary Roberson &amp; Scott Hale)</td>
<td>Presenting author: Terry Griffin, Kansas State University, Manhattan, KS (Terry Griffin) 1901288</td>
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### 138 Advances in Aquacultural Engineering—HYBRID

**Monday, July 8, 2:30pm-5:00pm**

**Location:** Provincetown

**Sponsored by:** NRES-28; NRES-262

**Moderators:** Steven Hall, North Carolina State University, Raleigh, NC; Muhammed Chowdhury, Texas A&M University, Kingsville, TX

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<td>2:35pm</td>
<td>Life Cycle Assessment of Aquaponics Systems</td>
<td>Provincetown</td>
<td>Presenting author: Brendan Higgins, Auburn University, Auburn, AL (David Blersch, Daniel Wells, Terry Hanson) 1900926</td>
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<tr>
<td>2:50pm</td>
<td>Modeling Hydrodynamic Effects on Oyster Upweller Systems</td>
<td>Provincetown</td>
<td>Presenting author: Matthew Campbell, NC State, Raleigh, NC (Steven Hall) 1901515</td>
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<tr>
<td>3:05pm</td>
<td>Hurricane Florence and Michael Post-mortem: Engineering Robust Marine Aquaculture Systems for Shellfish Systems and BMPs for High Energy Events</td>
<td>Provincetown</td>
<td>Presenting author: Steven Hall, NCSU Bio and Ag Engineering, Raleigh, NC (Steven Hall, Matthew Campbell, Melody Thomas, Russell Smith, Nathaniel Eddy) 1901494</td>
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<tr>
<td>3:20pm</td>
<td>A Human-Powered Catamaran Fish Feeder System for Small Fish Farmers of Developing Countries</td>
<td>Provincetown</td>
<td>Presenting author: Ritu Prem, Indian Institute of Technology, Kharagpur, West Bengal India 1901165</td>
</tr>
<tr>
<td>3:35pm</td>
<td>BREAK</td>
<td>Provincetown</td>
<td>Presenting author: Subha Manash Roy and Rajendra Machavaram, IIT Kharagpur, West Bengal, India (Subha Manash Roy, Rajendra Machavaram) 1900446</td>
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**NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.**
Monday, July 8

4:00pm Microbial Fuel Cell and Membrane Bioreactor Combination Offering an Effective Treatment to Fish Processing Wastewater for Facilitating Water Reuse  • Presenting author: Gourav Dhar Bhowmick, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India (Makarand Madhao Ghangrekar, Arunabha Mitra) 1900438

4:15pm Biochar as Alternative Media for Nitrate Removal from Aquaculture Effluents  • Presenting author: Diplina Paul, North Carolina State University, Raleigh, NC (Diplina Paul, Praveen Kolar, Steven G. Hall) 1900831

4:30pm Improving Nitrification Biofilter Performance with 3D Printed Media  • Presenting author: David Blersch, Auburn University, Auburn, AL (Gabriel Proaño, Andres Carrano) 1901844

4:45pm Industry Needs and Opportunities in Aquacultural Engineering  • Presenting author: Edward D. Aneshansley, Pentair, Marblehead, MA (Ed Aneshansley) 1901931

140 Challenges and Solutions to Declining Water Supplies for Irrigation
Monday, July 8, 2:30pm-5:00pm
Location: Orleans
Sponsored by: NRES-24; NRES-242
Modestors: Chris Henry, University of Arkansas, Stuttgart, AR; Ameneh Tavakol, Kansas State University, Manhattan, KS

2:35pm Recycled Water for Agricultural Irrigation: Developing a Geospatial Decision Analysis Tool  • Presenting author: Masoud Negahban-Azar, University of Maryland, College Park, MD (Masoud Negahban-Azar, Manashi Paul, Adel Shirmohammadi, Hubert Montas) 1901291

2:50pm Can We Use Wastewater to Grow Food?  • Presenting author: Peining Guan, McGill University, Montreal, Quebec, Canada (Jaskaran Dhiman, Shiv Prasher, Peining Guan, Eman ElSayed, Christopher Nzediegwu, Ali Mawof) 1901267

3:05pm The Application of Low-Cost Suspended Growth Process Technology for Mixed Wastewater Treatment and Reuse for Irrigation  • Presenting author: Precious N. Egbiuikwem, University of Surrey, Guildford, Surrey, United Kingdom (Precious N. Egbiuikwem, Devendra Saroj, Gregory Obiechefu) 1900143

3:20pm A West Texas Study: Irrigating with Treated Municipal Wastewater and Soil Water Holding Capacity  • Presenting author: Sonja Cook, Alan Plummer Associates, Inc., Fort Worth, TX (Amjad Assi, Rabi Mohtar, Cristine Morgan, Anish Jantrania) 1900817

3:35pm BREAK

3:45pm Role of Aging of Biochar in Reducing Metal Uptake by Potato Plants Irrigated with Wastewater  • Presenting author: Joba Purkaystha, McGill University, Montreal, Quebec, Canada (Christopher Nzediegwu, Shiv Prasher, Eman ElSayed, Jaskaran Dhiman, Ali Mawof, Joba Purkaystha) 1901189

4:00pm An Innovative Approach to Rainwater Harvesting for Irrigation Based on ENSO Forecasts  • Presenting author: Laljeet Sangha, Graduate Research Assistant, Auburn, AL (Jasmeet Lamba, Puneet Srivastava, Hemendra Kumar, Mark Dougherty, Rishi Prasad) 1900941

4:15pm Characterizing Surface Water Use for Irrigation in the Mississippi Delta  • Presenting author: Meredith Brock, Mississippi State University, Mississippi State, MS (Mary Love Tagert, Joel Paz, Lindsey Yasarer) 1901506

4:30pm The Arkansas Irrigation Yield Contest: A Novel Approach to Increasing Adoption of Irrigation Water Management Practices  • Presenting author: Chris Henry, University of Arkansas, Stuttgart, AR (C.G. Henry, D. M. Pickelmann, G. D. Simpson) 1901450

141 Environmental and Applied Tracers in Groundwater and Surface Water Systems—HYBRID
Monday, July 8, 2:30pm-5:00pm
Location: Falmouth
Sponsored by: NRES-21; NRES-224; NRES-25; NRES-252; NRES-253; NRES-28
Moderators: Troy Gilmore, University of Nebraska, Lincoln, NE; Qaisar Saddique, Northwest A&F University, Yangling, Shaanxi China

2:35pm Stable Isotope Ratios of Hydrogen and Oxygen as Tracers of Human Drinking Water in Boston, Massachusetts  • Presenting author: Casey Kennedy, USDA-ARS, East Wareham, MA (Casey Kennedy, Sophie Wilderotter) 1900088

3:05pm Multi-Year Enrichment of the Stable Isotopic Composition of Stream Water from Groundwater Recharge Due to Extreme Precipitation  • Presenting author: David Boutt, Department of Geosciences, UMass-Amherst, Amherst, MA (Stephen Mabee, Qian Yu) 1900843

3:35pm BREAK

3:45pm Remotely Sensing Sediment Tracers  • Presenting author: Anna Linhoss, Mississippi State University, Starkville, MS (Anna Linhoss, Joby Czarnecki, Sathish Samiappan) 1901826

4:00pm Sidewall Flow in Undisturbed Lysimeters: Experimental Limitation or Asset?  • Presenting author: Mark Williams, USDA-ARS NSERL, West Lafayette, IN (Mark Williams) 1901894

4:15pm Identifying Common Use Pesticides Degradation Byproducts and Pathways  • Presenting author: Jessica Satiroff, University of Nebraska-Lincoln, Omaha, NE (Jessica Satiroff, Tiffany Messer, Aaron Mittelstet, Dan Snow, Matthew Greiner) 1900203

4:30pm Recharge Seasonality Based on Stable Isotope Sampling Nebraska, USA  • Presenting author: Troy Gilmore, University of Nebraska-Lincoln, Lincoln, NE (Mikaela Cherry, Aaron Mittelstet, Didier Gastmans, John Gates) 1901833

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Monday, July 8

142 Implementing Water, Energy, and Food Sustainable Development Goals—INVITED
Monday, July 8, 2:30pm-5:00pm
Location: St. Botolph
Sponsored by: NRES
Moderators: Rabi Mohtar, American University of Beirut, Beirut, Lebanon; Bassel Daher, Texas A&M University, College Station, TX; Jordan Muell, Provost & Pritchard Consulting Group, Visalia, CA
2:30 pm Water-Energy-Food Nexus Consortium • Presenting author: Rabi Mohtar, Texas A&M University; American University of Beirut, Beirut, Lebanon 1901988
2:35 pm WEF Nexus and SDGs Overview • Presenting author: Bassel Daher, Texas A&M University, College Station, TX 1901989
2:45 pm SDG Implementation Challenges • Presenting author: Annette Huber-Lee, Stockholm Environment Institute, Somerville, MA 1901990
2:55 pm Role of Tools, Data and Assessments • Presenting author: Elfatih Eltahir, Massachusetts Institute of Technology, Cambridge, MA 1901991
3:05 pm Governance and Institutional Challenges • Presenting author: Kent Portney, Texas A&M University, College Station, TX 1901992
3:15 pm Private Sector Role in SDG Implementation • Presenting author: Debabrata Sahoo, Woolpert Inc, Columbia, SC 1901993
3:25 pm Local Scale Action • Presenting author: TBA 1901994

143 Innovations in Irrigation Systems
Monday, July 8, 2:30pm-5:00pm
Location: Yarmouth
Sponsored by: NRES-24; NRES-244
Moderators: Derek Heeren, University of Nebraska, Lincoln, NE; Sumon Datta, Oklahoma State University, Stillwater, OK
2:35 pm A Geospatial Tool for Design and Analysis of On Demand Pressurized Water Distribution Systems • Presenting author: Andre Daccache, University of California Davis, Davis, CA (N. Lamaddalena) 1900044
2:50 pm Large Scale Evaluation of a Low Energy Precision Application (LEPA) System Compared to Mid Elevation Spray Application (MESA) on Spearmint and Peppermint • Presenting author: Troy Peters, Washington State University, Prosser, WA (Behnaz Molaei, Abid Sarwar, Abdelmoneim Mohamed) 1901843
3:05 pm The Uniformities of Groundwater-Based Irrigation Systems in Oklahoma and Their Environmental Impacts • Presenting author: Divya Handa, Oklahoma State University, Stillwater, OK (Divya Handa, Robert S. Frazier, Saleh Taghvaeian, Jason G. Warren) 1900667
3:20 pm Software for Energy Consumption Optimization in Center Pivot Irrigation Systems • Presenting author: Joao Carlos Cury Saad, FCA-UNESP, Botucatu, SP, Brazil (Rafael Ludwig, Joao Carlos Cury Saad) 1900903

3:35 pm BREAK

3:45 pm Assessment of Water Use Efficiency of Membranes in Subsurface Irrigation Systems • Presenting author: Valeria Almeida Lima, The University of New South Wales, Sydney, NSW, Australia (Valeria Lima, Gregory Leslie, Bruce Sutton, Claudia Keitel) 1900912

NO-SHOW Evaluating the Performance of Rice Paddy under Managed Fields to Address Leaks from Paddy
• Presenting author: Oppong Kwabena Paul, Jiangsu University, Zhenjiang, Jiangsu China (Mao Hanping, Ning Yang, Li Lin) 1900132

4:15 pm Effects of Different Plastic-Film Mulching Practices on Maize Growth and Yield under Drip Irrigation in Sub-Humid Region of Northeast China • Presenting author: Jiusheng Li, China Institute of Water Resources and Hydropower Research, Beijing, China (Xiaodong Bo, Jiusheng Li, Yanfeng Li, Jun Wang) 1900467

144 Manure Treatment Systems
Monday, July 8, 2:30pm-5:00pm
Location: Hyannis
Sponsored by: NRES-27
Moderators: Linda Schott, University of Idaho, Twin Falls, ID; Ademola Ajayi-Banji, North Dakota State University, Fargo, ND
2:35 pm The Impact of Mechanical Solid Separators on the Mitigation of Methane Emissions from Dairy Manure Lagoons • Presenting author: Abdolhossein Edalati, University of CA, Davis, CA (Yike Chen, Hamed El-Mashad, Tyler Barzee, Xingjun Lin, Steve Zicari, Ruihong Zhang) 1901702
2:50 pm Flushing Liquid Manure Solid Distribution and Nutrients Associated with Solids of Different Particle Sizes • Presenting author: Lide Chen, University of Idaho, Twin Falls, ID (Kevin Kruger, Liang Wang, Howard Neibling) 1900138
3:05 pm Predicting the Efficiency of Solid Separators on Dairy Farms Using Particle Size Distribution Measured in the Laboratory • Presenting author: Yike Chen, University of California, Davis, CA (Abdolhossein Edalati, Tyler Barzee, Hamed El Mashad, Ruihong Zhang) 1901328
3:20 pm The Development of an Intermittent-Vacuum-Stripping Assisted Thermophilic Anaerobic Digestion Process for the Liquid Swine Manure Treatment • Presenting author: Renchuan Zhang, University of Minnesota, St. Paul, MN (Erik Anderson, Min Addy, Yanling Cheng, Paul Chen, Roger Ruan) 1900166
3:35 pm BREAK

3:45 pm The Impact of a Unique, Advanced Multistage Solid-Liquid Separator System on the Mitigation of Methane Emissions from a Dairy Manure Lagoon in California • Presenting author: Abdolhossein Edalati, University of CA, Davis, CA (Yike Chen, Hamed El-Mashad, Tyler Barzee, Xingjun Lin, Steve Zicari, Ruihong Zhang) 1901720
4:00 pm Pelleting Dairy Manure and Associated Compost to Mitigate Manure-Nutrients Transportation Cost • Presenting author: Femi Peter Alege, Washington State University, Pullman, WA (Lisa DeVetter, Haiying Tao, Pius Ndewga) 1900907

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Monday, July 8

4:15pm  Combined Anaerobic Digestion (AD) and Nutrient Capture System (NCS) for Energy Production and Nutrients Recovery from Poultry Litter  •  Presenting author: Amro Hassanain, Department of Environmental Science and Technology, University of Maryland, College Park, MD (Amro Hassanain, Stephanie Lansing, Andrew Moss) 1901736

4:30pm  An Economic Analysis of Solid Separation Technologies on Select California Dairy Farms  •  Presenting author: Yike Chen, University of California, Davis, Davis, CA (Abdolhossein Edalati, Tyler Barzee, Hamed El Mashad, Ruihong Zhang) 1901327

4:45pm  Advanced Treatment of Simulated Effluent from Bio-Treated Piggery Wastewater by a Novel Electrolysis Process  •  Presenting author: Duan Yalin, Zhejiang University, Hangzhou Zhejiang China (Jianghui Du, Zhiying Han, Yuyan Cai, Songming Zhu) 1900733

5:00pm  Biological Phosphorus Mineralization in Poultry Litter as a First Step Toward Sustainable Nutrient Recycling  •  Presenting author: Brendan Higgins, Auburn University, Auburn, AL (Kristin Chaump, Rishi Prasad) 1901134

145 National Basin-Scale Water Quality Review: Targets, Trends and Takeaways  •  Presenting author: Richard Batiuk, USEPA Chesapeake Bay Program Office (Richard Batiuk) 1901980

147 Agri-Industrial Facility Design and Operation  •  Presenting author: Brendan Higgins, Facility Engineering Services, Springdale, AR (Tom Gettings, P.E.) 1900258

2:35pm  Development of Equations for the Distribution of Seismic Forces in Ground Supported Flat Bottomed Silos and Bins  •  Presenting author: Jiyuan Chen, Enze Duan, Nan Jin, Peng Fang, Dandan Kong, Zhongxian Qi, Yi Jia, Qinhao Zhang, Chuchen Chang, Hongying Wang, Qiong Tong) 1900314

2:30pm  The Effect of Drying Rate and Storage Conditions on the Persistence of Isoflavones in Red Clover Hay  •  Presenting author: Shubham Subrot Panigrahi, University of South Australia, Adelaide Australia (Chandra B Singh, John Flelke) 1900976

3:05pm  Effect of Mediterranean Climatic Condition during Aeration and Silo Wall Coating in On-Farm Grain Storage in South Australia  •  Presenting author: Riwan Oyetunji, University of Kentucky, Lexington, KY (Riwan Oyetunji, Sue Nokes, Michael Flythe) 1900187

3:35pm  BREAK

NO-SHOW  search Progress on Long-Haired Rabbit Cage  •  Presenting author: Hongying Wang, China Agricultural University, Beijing, China (Jiyuan Chen, Enze Duan, Nan Jin, Peng Fang, Dandan Kong, Zhongxian Qi, Yi Jia, Qinhao Zhang, Chuchen Chang, Hongying Wang, Qiong Tong) 1900314

4:00pm  Session Wrap Up: Increasing Industry Involvement in Developing and Managing Standards

148 Precision Animal Management  •  Presenting author: Yang Zhao, Mississippi State University, Mississippi State, MS

2:35pm  Optimal Camera Placement for Visual Sensing of Livestock Animals in Confined Pen Environments  •  Presenting author: Joshua Peschel, Iowa State University, Ames, IA (Joshua Peschel) 1901341

2:50pm  Application of Elevated Perching Platform and Robotic Vehicle in Broiler Production  •  Presenting author: Xiaoyang Li, Joseph L. Purswell, Tom Tabler, Daniel Chesser, Yang Zhao) 1900304

3:05pm  Electronic Control for Hog Cooling Pads  •  Presenting author: Robert M. Stwalley III, Purdue University Agricultural & Biological
Monday, July 8

Engineering, West Lafayette, IN (Tyler Field, Morgan Burgett, Allan Schinckel) 1901304

3:20 pm Improving Ambient and Attic Temperature Readings in Commercial Broiler Houses · Presenting author: Jeremiah Davis, Auburn University, Auburn, AL (Jesse Campbell, Kelly Griggs, Dennis Brothers, Carson Edge) 1901174

3:35 pm BREAK


4:00 pm Evaluating Avoidance Distance of Broilers Exposed to Aerial Robotic Systems · Presenting author: Pratik Parajuli, Mississippi State University, Mississippi State, MS (Pratik Parajuli, Yang Zhao, Tom Tabler, Gary Daniel Chesser) 1900924

4:15 pm Thermo-Technical Parameters of the Different Bedding Surfaces in Cubicles for Dairy Cows as a Factor of Their Well-Being in Winter and Summer · Presenting author: Jana Lendelova, Slovak University of Agriculture in Nitra, Slovakia (Jana Lendelova, Stefan Mihina, Miroslav Zitnák, Michaela Nemethova, Lubormír Botto) 1900268

4:30 pm Low Cost GPS Receiver Accuracy for Cattle Monitoring · Presenting author: Gabriel Abdalai, University of Kentucky, Lexington, KY (Ruigang Yang, Jesse Hoagg, Mike Sama, Josh Jackson) 1900818

4:45 pm Comparison of Outside Air and Sol-Air Design Temperatures for Estimating Insulation Needs · Presenting author: Gary Chesser, Mississippi State University, Mississippi State, MS (G.D. Chesser Jr., Joseph L. Purswell, Jeremiah D. Davis, Jason K. Ward, Thomas Tabler, Yang Zhao) 1900924

5:00 pm Effect of Feed Form and Feeder Position on Feeding Behavior in Male Broilers · Presenting author: Joseph Purswell, USDA-ARS Poultry Research Unit, Mississippi State, MS (Joseph L. Purswell, Elizabeth J. Kim, Scott L. Branton) 1901078

5:15 pm Comparison of Old and New Evaporative Pads on a Commercial Broiler Farm · Presenting author: Carson Edge, Auburn University, Auburn, AL (Jeremiah Davis, Jesse Campbell, Kelly Griggs, Joseph Purswell, Dennis Brothers) 1901324

5:30 pm Evaluation of Bleed-Off Valves on Mineral Scale, Pad Efficiency, and Water Consumption in Poultry Evaporative Cooling Systems · Presenting author: John Linhoss, Mississippi State University, Mississippi State, MS (John Linhoss, Joseph Purswell) 1900838

149 Spectral Scattering, Fluorescence, and Raman Technology for Food Quality and Safety Monday, July 8, 2:30pm-5:00pm Location: Columbus II

Sponsored by: PRS-701; PRS-703; ITSC-348 Moderator: Jianwei Qin, USDA ARS, Beltsville, MD

2:35 pm Detection of trace Harmful Residues in Milk Using Up-Conversion Fluorescence Technology · Presenting author: Qin Ouyang, Jiangsu University, Zhenjiang, Jiangsu Province, China (Qin Ouyang, Quansheng Chen, Huanhuan Li, Yan Liu) 1900871

2:50 pm Automatic identification Method of Varieties of Pesticide Residues in Fruits · Presenting author: Yankun Peng, China Agricultural University, Beijing China (Liang Song, Yankun Peng, Yongyu Li, Yan Li, Kuanglin Chao, Jianwei Qin) 1900786

3:05 pm Potential of Grain Truck Inspections with a Drone or Go-Pro Camera System · Presenting author: Daniel Brabec, USDA-ARS, Manhattan, KS (Daniel Brabec, James Campbell, Brandon Rapp) 1901906

NO-SHOW : Haptoglobin Detection Based on Enhanced Chemiluminescence of Gold Nanoparticles · Presenting author: Giorgi Shntenberg, Institute of Agricultural Engineering, ARO, the Volcani Center, Bet Dagan, Israel (Giorgi Shntenberg, Narsingh R. Niral) 1900097

3:35 pm BREAK

3:45 pm Rapid nondestructive Qualitative Discrimination of Egg Freshness by VIS/NIR Spectroscopy · Presenting author: Hubo Xu, China Agricultural University, Beijing, China (Zhixiong Shen, Xiuying Tang, Zhengxuan Li, Jun Dong, Xiaoguang Dong, Hubo Xu) 1900393

4:00 pm Maintaining the Predictive Abilities of Tea Moisture Content Models on Different Environment Based on Visible and Near-Infrared Spectroscopy Technique · Presenting author: Zhenxiong Huang, Fujian Agriculture and Forestry University, Fuzhou, Fujian China (Zhenxiong Huang, Haiyun Li, Lang Liu, Xiaoli Li, Dapeng Ye) 1901013

4:15 pm Spatial Frequency Domain Imaging Coupled with Frequency Optimization for Estimating the Optical Properties of Two-Layer Food Products · Presenting author: Dong Hu, Zhejiang A&F University, Hangzhou, Zhejiang China (Renfu Lu, Yibin Ying) 1900695

4:30 pm Comparative Study and Optimization of Near-Infrared Diffuse Reflection and diffuse Transmission of Rice Amylase · Presenting author: Ya-Chao Liu, China Agriculture University, Beijing China (Ya-chao Liu, Yong-yu Li, Yan-kun Peng, Shuai Yan, Kai-yuan Deng) 1900388


150 Use of Models to Study Crop Drying, Handling and Storage—INVITED Monday, July 8, 2:30pm-5:00pm Location: Salon K

Sponsored by: PRS-702 Moderator: John Lawrence, Kansas State University, Manhattan, KS

2:35 pm Mathematical Models as Stored-Grain Ecosystems Management Tools · Presenting author: Digvir Jayas, University of Manitoba, Winnipeg, MB, Canada (Digvir Jayas) 1901921

2:55 pm Storage and Flow of Bulk Solids · Presenting author: Greg Mehos, Greg Mehos & Associates, Westford, MA (Greg Mehos) 1901920

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Monday, July 8

3:15pm  Evolution Rate of Phosphine from Aluminum Phosphide Tablets Using Fluent CFD Model  Presenting author: Sherif Elsayed, Kansas State University, Manhattan, KS (Sherif Elsayed, Mark Casada, Ronaldo Maghirang) 1901917

3:35pm  BREAK

3:45pm  Commercial Use of Models to Manage Postharvest Systems for Peanuts  Presenting author: Chris Butts, USDA ARS, Dawson, GA (Chris Butts) 1901919

4:05pm  Discrete Element Methods used in Grain/Seed Processing Industry  Presenting author: Kingsly Ambrose, Purdue University, West Lafayette, IN (Madhu Kodam) 1901918

4:25pm  Mathematical Modeling of Rice Drying Operations  Presenting author: Bhagwati Prakash, University of Arkansas, Fayetteville, AR (Bhagwati Prakash) 1901916

**SmartAg Wrap Session**

Monday, July 8, 4:00pm-5:30pm
Location: Nantucket
Moderator: Ajit Srivastava, Michigan State University, East Lansing, MI

The purpose for the SmartAg Wrap Session is to continue the dialogue between ASABE and IEEE members regarding the creation of a SmartAg international community for the purpose of development, application and transfer of related technologies and innovation.

**151 NRES—Natural Resources & Environmental Systems POSTER SESSION**

Monday, July 8, 5:00pm-7:00pm
Posters will be displayed for the entire session, but authors will be present at posters as follows:
5:00pm-6:00pm, authors with ODD numbered posters present
6:00pm-7:00pm, authors with EVEN numbered posters present
Location: Gloucester
Sponsored by: NRES
Moderator: Srinivasulu Ale, Texas A&M AgriLife, Vernon, TX

1  Anaerobic Co-Digestion of Poultry Litter and Wheat Straw Affected by Solids, Free Ammonia, and Carbon/Nitrogen Ratio with Response Surface Analysis  Presenting author: Jun Zhu, University of Arkansas, Fayetteville, AR (Jun Zhu, Sarah Wu, Jiacheng Shen) 1900026

2  Strategy for Addressing Ammonia Inhibitions in Anaerobic Digestion of Food Wastes  Presenting author: Pius Ndegwa, Washington State University, Pullman, WA (Yiqing Yao, Sifolo Coulibaly) 1901639

3  Techno-Economic Analysis of Solid Manure Composting  Presenting author: Daniel Andersen, Iowa State University, Ames, IA (Jin-Yew Lim, Erica Timmermans, Daniel Andersen) 1901726

4  Anaerobic Digestion: Evaluating the New Realities of an Ancient Technology as Feedstock Move from Manure to Biomass  Presenting author: Daniel Andersen, Iowa State University, Ames, IA (Daniel Andersen) 1901732

5  Biosolids-Derived Organomineral Fertilizers from Anaerobic Digestion Digestate: Opportunities for Australia  Presenting author: Bernadette K. McCabe, Centre for Agricultural Engineering, University of Southern Queensland, Toowoomba, Queensland Australia (Bernadette K. McCabe, D. L. Antille, Serhiy Marchuk, Stephan Tait, Seonmi Lee, Jochen Eberhard, Craig Baillie) 1900192

6  Identification and Analysis of Organic Waste Produced from Australian Intensive Livestock Industries: Opportunities for Aggregation and Treatment Via Co-Digestion  Presenting author: Bernadette K. McCabe, Centre for Agricultural Engineering, University of Southern Queensland, Toowoomba, Queensland Australia (Bernadette K. McCabe, Stephan Tait, Serhiy Marchuk, Seonmi Lee, Dio Antille, Jochen Eberhard, Craig Baillie) 1900170

7  Evaluation of the Log-Phase Reduction during Anaerobic Digestion of Protein for High-Efficiency Biogas Production  Presenting author: Min-Jee Kim, Kangwon National University, Chuncheon, Gangwon, Republic of Korea (Min-Jee Kim, Sang-Hun Kim) 1901436


12  The Effect of pH and Ferric Ion on Recalcitrant Dissolved Organic Nitrogen Production from the Thermal Hydrolysis of Biosolids  Presenting author: Dian Zhang, Virginia Tech, Manassas, VA (Zhi-Wu Wang, Wendell Khunjar) 1900235

13  Effectiveness of Pit Additive in Reducing Emissions and Solids  Presenting author: Cuong Duong, Columbia, MO (Cuong Duong, Teng Teeh Lim, Allen Haipeng Wang) 1900927

14  The Impact of a Weeping Wall on the Mitigation of Methane Emissions from a Dairy Manure Lagoon in California  Presenting author: Abdelhossein Edalati, University of CA, Davis, Davis, CA (Yike Chen, Hamed El-Mashad, Tyler Barzee, Ruihong Zhang) 1901747

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15 Cloning of a Novel Ring Cleavage Dioxygenase Responsible for Diphenyl Ether Degradation in Strain Sphingobium SC_3 and Its Engineering Application Attempt • Presenting author: Shu Cai, UC Davis, Davis, CA (Shu Cai, Ruilong Zhang) 1901364

16 Phosphorus Removal from Anaerobic Digestion Effluent Filtrate Using Flue Gas Desulfurization (FGD) Gypsum and the Techno-Economic Analysis • Presenting author: Leipeng Cao, The Ohio State University, Wooster, OH (Fuqing Xu, Leipeng Cao, Harold Keener, Ajay Shah, Yebo Li) 1901577

17 Soil Properties as Affected by Long-Term Land Application of Paunch • Presenting author: Diogenes Antille, CSIRO Agriculture and Food, Canberra, Australian Capital Territory, Australia (Diogenes L. Antille, Kyra C. O'Sullivan, Bernadette K. McCabe, Serhyl Muchuk, Jochen Eberhard, Seonmi Lee, Craig P. Baillie) 1900047

18 The Influence of Compaction and Organic Fertilizer Incorporated into Sandy Loam Soil on Its Saturated Hydraulic Conductivity in North Eastern Nigeria • Presenting author: Eli Mamman, University, Maiduguri, Borno, Nigeria (Mamman, Eli) 1901459

19 Antibiotics On Farms from the Farmer Perspective • Presenting author: Christine Georgakakos, Cornell University, Ithaca, NY (M.Todd Walter) 1901841

20 Synergistic Effect of Cationic Polymer with Hydrogel on Bacterial Reduction in Water Systems • Presenting author: Zong Liu, Texas A&M University, College Station, TX (Zong Liu) 1901389

21 Multi-Point High Frequency Sampling System to Gain Deeper Insights on the Fate of Nitrate in Artificially Drained Fields • Presenting author: Wenlong Liu, North Carolina State University, Raleigh, NC (Bryan Maxwell, François Birgand, Mohamed Youssef, George Chescheir, Shiyong Tian) 1901794

22 Measuring the Effect of Sediment E. coli Concentration on Water Quality by Analysing Spatial and Temporal Data • Presenting author: Sadia Salam, South Dakota State University, Brookings, SD (Rachel McDaniel, Bruce Bleakley) 1900081

23 Drainage Water Recycling in Central Iowa • Presenting author: Sam Phillips, Iowa State University, Ames, IA (Sam Phillips, Matthew Helmers, Chris Hay) 1901168

24 Drainage Water Recycling to Increase Crop Yield and Improve Water Quality • Presenting author: Hossam Moursi, North Carolina State University, Raleigh, NC (Mohamed Youssef, Chad Poole, Lamyaa Negm) 1901229

25 Tile Depth and Spacing Effect on Field-Scale Hydrological Responses and Crop Production • Presenting author: Hanseok Jeong, University of Illinois, Urbana, IL (Rabin Bhattarai, Richard A. Cooke) 1901264

26 Simulated Effect of Real-time Water Table Management on Hydrology and Crop Yield in Eastern North Carolina • Presenting author: Ehsan Bagheri, NC State University, Raleigh, NC (Mohamed Youssef, Lamyaa Negm, Chad Poole, George Chescheir, Wayne Skaggs) 1900971

27 Effects of Winter Cover Crops and N Fertilization Rate on Corn Production and N Leaching Loss in the Colder Regions of Southern Minnesota • Presenting author: Mohammad Anar, University of Minnesota, Lamberton, MN (Vijaya Joshi, Jeffrey Vetsch, Jeffrey Strock, Axel Garia) 1901769

28 Designing Stormwater Control Measures for Maintenance • Presenting author: Kathleen Balaze, North Carolina State University, Raleigh, NC (Sarah Waichowski, William Hunt III) 1901663

29 Study of Flood Impact in Katy Prairie • Presenting author: Cynthia Partheeban, Texas A&M University, Irving, TX (Jaber Fouad, John Jacob) 1901391

30 Permaculture in Rural Panama: Technical Difficulties of Early Adoption • Presenting author: Roberto Forte, McGill University, Montreal, Quebec Canada (Grant Clark) 1901588

31 Dog Food Compared to Kitchen Waste in Vermicomposting • Presenting author: Cameryn Taylor, Oklahoma State University, Stillwater, OK (Douglas Hamilton) 1901176

32 Evaluating the Cost-Effectiveness of Low Impact Development Practices in Reducing Urban Stormwater Runoff Quantity Using the Soil and Water Assessment Tool • Presenting author: Siyu Li, University at Albany, SUNY, Albany, NY (Yaoze Liu) 1900259

33 Performance Evaluation of SWAT and HSPF Models for Nutrient Yield in Big Sunflower River Watershed • Presenting author: Ayaq Rishal, Department of Agricultural and Biological Engineering, Mississippi State University, Mississippi State, MS (Prem B. Parajuli, Ying OuYang) 1900106

34 Antibiotic Residues in Soil and Runoff from Dairy-Manure Applied Fields Subject to Varied Rainfall • Presenting author: Tania Leventhal, The Pennsylvania State University, State College, PA (Heather Gull, Lou Saporito, Kyle Elkin, Tamie Veith, Peter Kleinman) 1901817

35 Impact of Silver Nanoparticle Presence in Wastewater on Heavy Metal Transport in Soil and Radish Plants • Presenting author: Tianai Zhou, McGill University, Montpellier, Quebec, Canada (Tianai Zhou, Shiv Prasher, Saji George, Jennifer Ronholm, Danielle Donnelly, Ali Mawof, Peining Guan) 1901468

36 Comparing Soil Moisture Retention In Soils Managed For Cotton Production And Managed Using Conservation Versus Conventional Practices • Presenting author: Gary Hawkins, University of Georgia, Watkinsville, GA (Rachel Collier, Ernest Tonnler) 1901454

37 Evaluation of Alternative Management Practices in Northeastern Dairy Agroecosystems: Edge-of-Field Hydrologic and Nutrient Fluxes • Presenting author: Cameron Twombly, University of Vermont, Burlington, VT (Joshua Faulkner, Stephanie Hurley) 1900889

38 Assessing the Effects of Biofuel Crops on Streamflows and Water Quality in Northern Lake Erie Watershed, Ontario • Presenting author: Fahimeh Jafarianlari, University of Guelph, Guelph, Ontario Canada (Fahimeh Jafarianlari, Prasad Daggupati) 1901662

39 Estimation of Auto-Irrigation Water Using APEX model • Presenting author: Soohong Kim, (Seoro Lee, Gwanjae Lee, Soohong Kim, Jounggun Kim, Kyoungjae Lim) 1901073

42 NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
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40 Assessment of Agricultural Drought Monitoring and Early Warning Using a Suite of Satellite-Based Drought Indices in East Asia • Presenting author: Won-Ho Nam, Hankyong National University, Anseong, Republic of Korea (Won-Ho Nam, Dong-Hyun Yoon, Hee-Jin Lee, Eun-Mi Hong, Taegon Kim, Dae-Eui Kim, Tsegaye Tadesse, Mark Svoboda, Michael Hayes) 1900744

41 Effects of Tillage and Manure Type on Nitrogen and Phosphorus Losses through Surface Runoff from Winter Manure Application • Presenting author: Laxmi Prasad, University of Wisconsin Madison, Madison, WI (Anita Thompson, Francisco Arriaga, Peter Vadas) 1900355

42 Impact of Surface Runoff Rate on Stream Water Quality • Presenting author: Hakkkwan Kim, Seoul National University, Pyongchang, Gangwon, South Korea (Sunsook Jang, Hyunseo Ji, Jiyong Jonggun Kim, KyoungJae Lim) 1901093

43 Analysis of the Effect of Water Quality Improvement on Seomgang and South Han River by Securing the Flow during Dry Season • Presenting author: Seoro Lee, Kangwon National University, Gangwondo South Korea (Seoro Lee, Gwanjae Lee, Yujin Choi, Jonggun Kim, KyoungJae Lim) 1901079

44 Analysis of Non-point Pollution Loads Variety Depending on Application on NPS Reduction Facility Scenarios • Presenting author: Yujin Choi, Kangwon National University, Chuncheon, Gangwon South Korea (Yujin Choi, Gwanjae Lee, Dongseok Yang, Geon woo Park, Jonggun Kim, KyoungJae Lim) 1901093

45 Use of ENSO Forecasts to Withdraw Water Sustainably from Streams for Irrigation • Presenting author: Laljeet Sangha, Graduate Research Assistant, Auburn, AL (Jasmeet Lamba, Puneet Srivastava, Hemendra Kumar, Mark Dougherty, Rishi Prasad) 1901191

46 Using Ensemble Precipitation Forecasts to Improve Hydrologic Risk Assessments at River Crossings • Presenting author: Daniel Gambill, USACE ERDC-CEL, Champaign, Illinois (Francina Dominguez, Daniel Gambill, Heidi Howard, Praveen Kumar) 1901193

47 Water Quality Index Assessment of Old Brahmaputra River Water in Bangladesh • Presenting author: Sumon Datta, Oklahoma State University, Stillwater, OK (Zahida Muyen, Sharmin Akthar, Siddikur Rahman) 1901258

48 Effluents from Dyeing Industries: Quality and Agricultural Reuse Potential • Presenting author: Sumon Datta, Oklahoma State University, Stillwater, OK (Zahida Muyen, Moktar Hossain, Siddikur Rahman) 1901246

49 Suitability Assessment and Mapping to Support Development of Resilient Communities and Livelihoods in Selected Vulnerable Communities in Cagayan Province • Presenting author: Junel B. Guzman, Cagayan State University, Tuguegarao City, Cagayan, Philippines (Junel Guzman) 1901804

50 Comparison of CROPGRO-FRM in RZWQM2 and DSSAT for Simulating Alfalfa Growth and Evapotranspiration in Southern Colorado • Presenting author: Huihui Zhang, USDA-ARS, Fort Collins, CO (Huihui Zhang, Liwang Ma, Rob Malone, Allan Andales, Kurt Christian Kersebaum) 1901924


52 Modeling the Effectiveness of Management Actions to Offset Potential Future Changes in Microbial Water Quality • Presenting author: Rory Coffey, ORISE participant at U.S. EPA Office of Research and Development, Washington D.C. (Rory Coffey, Jon Butcher, Brian Benham, Thomas Johnson) 1901930

53 Does Cover Crop Mitigate Climate Extremes Impact on System Water Use Efficiency in a Maize-Soybean Cropping System? • Presenting author: Yizhuo Li, Auburn University, Auburn, AL (Yizhuo Li, Di Tian, Gary Feng, Liping Feng) 1901927

54 A Low Cost Mechanized Tube Well Installer • Presenting author: Robert M. Stwalley III., Purdue University Agricultural & Biological Engineering, West Lafayette, IN (Robert Stwalley III) 1901319

55 Implications of Potential Introduction of New High-Value Vegetable Crops in the Irrigated Central Washington State • Presenting author: Fidel Maureira, Washington State University, Pullman, WA (Fidel Maureira, Eduardo Ramos-Real, Kirti Rajagopal, Jennifer Adam, Claudio Stockle) 1901541

56 Evaluation of Sprinkler Irrigation System Hydraulic Performance Effect on Soil Crusting • Presenting author: Junping Liu, Jiangsu University, Zhenjiang City, Jiangsu Province, China (Junping Liu, Isaya Kisekka, Tao Li) 1900277

57 Direct Seeded Guayule Grown in Arizona under Furrow and Subsurface Drip Irrigation • Presenting author: Diaa Eldin M. Elshikha, University of Arizona, Tuscon, AZ (Diaa Eldin M. Elshikha, Peter M. Waller, Douglas J. Hunsaker, David Dierig, Sam Wang, Mark V. Cruz, Kevin F. Bronson, Matthew E. Katterman) 1900040

58 Improving Operational Performance of Irrigation Canal Network System for Drought Risk Management Using Hydraulic Model • Presenting author: Tae-Hyun Ha, Korea Rural Cooperation Corporation, Daejeon, Republic of Korea (Tae-Hyun Ha, Won-Ho Nam, Jong-Won Do, Seung-Yong Lee, Eui-Yup Jung, Kwang-Ya Lee) 1900983

59 Effects of Fertigation Spills through Center Pivot on the Growth and Yield of Winter Wheat • Presenting author: Weixia Zhao, China Institute of Water Resources and Hydropower Research, Beijing, China (Weixia Zhao, Jiusheng Li, Yanfeng Wei, Huihui Zhang, Lei Zhang, Qian Zhang, Peicun Jia) 1900706

60 Comparison of Surface and Subsurface Water Distribution Uniformities under Center Pivot Irrigation System for Sugarcane in Colombia • Presenting author: Christian J. Mendoza, Cenicana, San Antonio, Valle del Cauca Colombia (Christian Mendoza, Javier Carbonell, Jhon Lasso) 1900785

61 Effects of Different Irrigation and Fertilization Treatments on Tomato Growth and Water Distribution and Fertilizer Distribution Uniformity in Greenhouse • Presenting author: Weibing Jia, Xian Jiaotong University, Xian city, Shan Xi Province China (Weibing Jia, Zhengying Wei, Yubin Zhang, Lei Zhang, Qian Zhang, Peicun Feng) 1900784

62 Effect of Phosphorus Fertilization on Clogging in Drip Emitters Applying Saline Water • Presenting author: Jun Wang,
Monday, July 8

China Institute of Water Resources and Hydropower Research, Beijing, China (Xiaoliang Zhang, Zeng Wang, Yuansheng Li, Yanfeng Li, Hongquan Liu, Jun Wang) 1901127

63 Irrigation Water Use Efficiency and Crop Water Productivity under Smallholder Shared Center Pivot Irrigation Systems in Rwanda • Presenting author: Ankit Chandra, University of Nebraska-Lincoln, Lincoln, NE (Ankit Chandra, Lameck Odhiambo, Nick Brozovic, Ellen Emanuel) 1900848

64 Developing an Operational Framework for Implementing Precision Irrigation Management in Almonds by Integrating Remote Sensing, Proximal Sensing and GIS in iCrop • Presenting author: Jingyuan Xue, Land Air and Water Resources, UC Davis, Davis, CA (Isaya Kisekka) 1900084

65 Water Dynamics in Cropland Fields under Rain-Fed and Different Types of Irrigation Practices • Presenting author: Hemendra Kumar, Auburn University, Auburn, AL (Aljatee Sangha, Puneet Srivastava, Jasmeet Lamba, Guilherme Morata, Luca Bondesan, Brenda V. Ortiz) 1901788

66 Corn Irrigation in the Upper Midwest U.S. • Presenting author: Axel Garcia y Garcia, University of Minnesota, Lamberton, MN (Axel Garcia y Garcia, Jeffrey Strock, Shuhui Liu) 1901744

67 Evaluation of Irrigation Termination Effects on Cotton Yield and Water Use Efficiency under Deficit Irrigation Strategies in the Texas High Plains • Presenting author: Sushil Kumar Himanshu, Texas A&M AgriLife Research, Vernon, TX (Sushil Kumar Himanshu, Srinivasulu Ale, Nina Omani, James Bordovsky, Kelly Thorp, Edward Barnes) 1900799

68 Simulating Soil Moisture Fluctuations under Irrigated Crops Using HYDRUS Model • Presenting author: Mukesh Mehata, Oklahoma State University, Stillwater, OK (Saleh Taghvaeian, Sumon Datta, Daniel Moriasi) 1901217


70 Estimation of Soil Water Contents under Fountain Irrigation Using HYDRUS • Presenting author: Jongsook Kim, Pusan National University, Miryang, Kyungnam, South Korea (Donghyun Kim, Jongsook Kim, Soon Hong Kwon, Ki-Yeol Jung, Sang Hun Lee) 1900634

71 Identification of Soil Hydraulic Properties Based on micro- GA Algorithm and Simulation of Soil Water Movement under Drip Irrigation • Presenting author: Kefeng Zhang, Ningbo Institute of Technology, Ningbo, Zhejiang Province China (Binbin Liu, Huixia Jin) 1900586

72 Irrigation Dampens Interannual Variability in U.S. Agriculture by Over 40% • Presenting author: Meetpal Kukal, University of Nebraska-Lincoln, Lincoln, NE (Suat Irmak) 1900868

73 Optimal Irrigation Management System Based on Hydraulic Analysis of Irrigation Canal • Presenting author: Jong-Won Do, Korea Rural Community Corporation, Daejeon, Republic of Korea (Jong-Won Do, Won-Ho Nam, Kwang-Ya Lee, Tae-Hyun Ha, Seung-Yong Lee, Eui-Yup Jung) 1900967

74 Sediment Fingerprinting to Determine the Source of Suspended Sediment in an Urbanized Watershed • Presenting author: Kritika Malhotra, Auburn University, Auburn, AL (Kritika Malhotra, Ash Abebe, Jasmeet Lamba) 1900632

75 Assessing the Variability of Erodibility Parameters at a Regional Scale: A Case Study from the North Carolina Piedmont Region • Presenting author: Alexis Swanson, North Carolina State University, Raleigh, NC (Alexis Swanson, Celso F. Castro-Bolinaga, Periann Russell) 1901290

76 Getting to the Root of Erosion: A Case Study to Estimate Streambank Erosion • Presenting author: Emily M. Darr, North Carolina State University, Raleigh, NC (Celso Castro-Bolinaga, Ilona Peszlen, Periann Russell) 1900950

77 An Integrated Modeling Approach to Evaluate the Effects of Dam Removal on River Corridors through the Lens of the Watershed • Presenting author: Abhinav Sharma, North Carolina State University, Raleigh, NC (Celso Castro-Bolinaga, Natalie Nelson) 1900982

78 Evaluating the Effect of Zayanderud River Drying up on the Underground Water Quality (Case Study: Najafabad and Isfahan Plain) • Presenting author: Farzaneh Khorsandi, Department of Biological and Agricultural Engineering, University of California, Davis, CA (Zohreh Khorsandi, Farhad Mokhtari, Farzaneh Khorsandi) 1901012

79 A Study on the Effect of Reduced Water Amount on Downstream Watershed Due to the Dam Construction • Presenting author: Gwanjae Lee, Kangwon National University, Chuncheon, Gangwon-do South Korea (Seoro Lee, DongSeok Yang, Kyoung Jae Lim, Jonggun Kim) 1901076

80 Assessment of Mutual Relationship among the Soil Heavy Metals around the Mining Areas • Presenting author: Jinying Zhao, Anhui University, Hefei, Anhui Province China (Jinying Zhao, Linzheng Huang, Dongyan Zhang) 1900508

81 Planting Native Perennial Grasses in Multifunctional Riparian Buffers for Water Quality and Farm Profit • Presenting author: Steph Herbstritt, Penn State, University Park, PA (Steph Herbstritt, Deb Nardone, Suzy Yetter, Armen Kemanian, Tom L. Richard) 1900586

82 Challenges and Opportunities in Sustainable Agroecosystems in the Florida Panhandle • Presenting author: Johnny Grace, USDA-Forest Service, Tallahassee, FL (J.M. Grace III, Y. Ouyang, A. Swamy, L. Nagia, O.S. Mbuya) 1901882

83 Bioremediation of Naphthalene Contaminated Landfill Leachate: An Evaluation of Different Soils for Degradation Potential • Presenting author: Steven White, Oregon State University, Corvallis, OR (Ganti Murthy) 1901462

84 A Meta-Analysis on the Impact of Nitrification Inhibitor and Manure Application Timing on Corn Yield and NO3-N Loss in the Midwestern US • Presenting author: Alyvia Steenhoek, Iowa State University, Ames, IA (Daniel Andersen, Jin Yew-Lim) 1901752

44 NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.

Selecting BMP Locations Based on the Relationship Among Stream Order, Land Use and Water Contaminants Using SWAT • Presenting author: Johann Vera, Purdue University, West Lafayette, IN (Bernard Engel, Indrajeet Chaubey) 1901407

Crop Water Requirements, Biomass and Grain Yields Estimation for Upland Rice Using CROPWAT, AQUACROP and CERES Simulation Models • Presenting author: Christopher Akinbile, Federal University of Technology, Akure, Ondo Nigeria (Ayotunde Ogundipe, Raphael Davids) 1900196

Ephemeral Gully Erosion Modeling and Surveying with Close-Range Digital Photogrammetry • Presenting author: Md Atiqul Islam, Kansas State University, Manhattan, KS (Md Atiqul Islam, Chinthaka Weerasekara, Yan Zhou, Aleksey Y. Sheshukov) 1901426

6th Decennial National Irrigation Symposium

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A joint ASABE/IA Irrigation Symposium

Nov. 30-Dec. 4, 2020 San Antonio, TX

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Coffee and tea are available in the Exhibit Hall on Monday and Tuesday 9:00am-11:00am and 2:00pm-4:00pm, and Wednesday 7:00am-9:30am.

201 Biologically Inspired Micro/Nanoengineering Systems—INVITED
Tuesday, July 9, 9:30am-12:00pm
Location: Salon H
Sponsored by: ASE-08
Moderators: Jangho Kim, Department of Rural and Biosystems Engineering, Chonnam National University, Gwangju, Republic of Korea; Jin-Woo KIM, Department of Biological & Agricultural Engineering, University of Arkansas, Fayetteville, AR
Biologically inspired micro- and nanoengineering systems are unique platforms inspired by complex structures and functions of living systems such as animals, plants, and humans. Combining the traditional agriculture and biological engineering principles and techniques with the innovative micro- and nanotechnologies, biologically inspired engineering systems can provide new solutions in local, national and global challenges of agriculture and biological fields. This session will focus on the recent advances in the design, fabrication, and applications of such biologically inspired micro- and nanoengineering systems for advanced agriculture and biological fields to enhance economic well-being and quality of life.

9:35am Bio-inspired, Sprayable and Rechargeable Antimicrobial Coatings to Improve Food Safety • Presenting author: Minglin Ma, Cornell University, Ithaca, NY 1901875

10:00am Development of Natural Resource-Derived Biomaterials Using Nano- and 3D Printing Technologies • Presenting author: Hoon Seonwoo, Department of Industrial Machinery Engineering, Sunchon National University, Suncheon, Republic of Korea 1901870

10:25am Natural Resource-Based Nanohybrids in Food & Biomedical Applications • Presenting author: Ki-Taek Lim, Kangwon National University, Chuncheon, Gangwon, Republic of Korea 1901876

10:50am BREAK

11:00am Multiscale Biomimetic Approaches for Engineering Living Systems • Presenting author: Jangho Kim, Department of Rural and Biosystems Engineering, Chonnam National University, Gwangju, Republic of Korea 1901873

11:25am New Targets and Nanotechnology-Enabled Strategies to Induce Browning of Adipocytes for the Treatment of Obesity • Presenting author: Di Huang, Department of Animal Sciences, Bindley Bioscience Center, West Lafayette, IN (Di Huang, Mario Alberto, Shihuan Kuang, Meng Deng) 1901871

202 Curriculum Design and Student Success
Tuesday, July 9, 9:30am-12:00pm
Location: Regis
Sponsored by: EOPD-203
Moderator: Amy Kaleita, Iowa State University, Ames, IA

9:35am An Evaluation of Professional Development Needs of College Agricultural Students • Presenting author: Curtis Langley, Tarleton State University, Stephenville, TX (Michaela Bram) 1901835

9:50am Higher Education Institutions Can Change the World • Presenting author: Roula Bachour, American University of Beirut, Beirut, Lebanon (Roula Bachour, James French, John Kennelly, Jose Zaglul, Fadlo Khuri, Rabi Mohtar) 1901095

10:05am Lessons Learned by INFEWS-ER’s Virtual Resource Center for Transdisciplinary Graduate Student Training at the Nexus of Food, Energy, and Water • Presenting author: Richard Koelsch, University of Nebraska-Lincoln, Lincoln, NE (Richard Koelsch, Luis F. Rodríguez, Shannon Banner, John Classen, Dan Cotton, Alison Deviney, Jill Heemstra, Jacek Koziel, Deanne Meyer, Anna-Maria Marshall, Anand Padmanabhan, Daniel Steward) 1900876

10:20am Growing Community and Innovation at the Student Farm through an Undergraduate Engineering Design Project • Presenting author: Jennifer Mullin, UC Davis, Davis, CA (Katharina Ullmann, James Muck) 1901265

10:35am BREAK

10:45am Environmental Systems Management: From Lecture to Flipped to Online • Presenting author: Natalie Carroll, Purdue University, W. Lafayette, IN 1900048

11:00am Alumni, Faculty and Employer Insights into Agricultural Operations Management Curricula • Presenting author: Jonathan Watson, University of Florida, Gainesville, FL (Adam Watson, Kati Migliaccio, Wendell Porter) 1901449

11:15am Leveraging Student Capstone Teams to Conceptualize and Implement Improvements in the Undergraduate Laboratory • Presenting author: Gretchen Mosher, Iowa State University, Ames, IA (Steven D. Bell, Timothy A. Shepherd, Stuart J. Birrell) 1900657

11:30am The Impacts of Education and Public Outreach on Effective Management of On-Site Wastewater Treatment Systems in Texas • Presenting author: Gabriele Bonaiti, Texas A&M University, College Station, TX (Askarali Karimov, Ryan Gerlich, Anish Jantrania) 1900599

11:45am Cultivating PhD Scientists in a Pre-Med Undergraduate Environment: Creating a Community of Scholarship and Removing Institutional Barriers • Presenting author: Daniela S. Jones, North Carolina State University, Raleigh, NC (Daniela S. Jones, Devyn D. Gillette, Paige E. Cooper, Raquel Y. Salinas, Jennifer L. Hill, Sherilynn J. Black, Daniel J. Lew, Dorian A. Canelas) 190107
Tuesday, July 9

203 Advances in Biomass Preprocessing
Tuesday, July 9, 9:30am-12:00pm
Location: Salon K
Sponsored by: ES-220; MS-23/7/2
Moderator: Jaya Shankar Tumuluru, Idaho National Laboratory, Idaho Falls, ID

9:35am Coupling Mechanical Size Reduction with Dry Chemical Pretreatment through Ball Milling: Lignocellulosic Biomass Based Sugars with a New Delignification Approach
• Presenting author: Mohammadali Azadfar, Washington State University, Pullman, WA (Galen Herz, Cecile Cardinali, Michael Wolcott) 1900161

9:50am Impact of Moisture Content and L/D Ratio on the Pelleting Characteristics of 75% pine+25% Switchgrass Blend in a Pilot Scale Ring Die Pellet Mill
• Presenting author: Jaya Shankar Tumuluru, Idaho National Laboratory, Idaho Falls, Idaho, MS (Jaya Shankar Tumuluru, Matthew Dee, Dana Scouten) 1900336

10:05am Effect of Ultrasonic Pretreatment on the Chemical Composition and Pellet Quality of Camelina Straw
• Presenting author: Onu Olughu, University of Saskatchewan, Saskatoon, Saskatchewan, Canada (Lope Tabil, Tim Dumonceaux) 1901538

10:20am Optimization of Microbial Pretreatment of Camelina Straw and Switchgrass in a Solid State Fermentation System to Produce Solid Biofuel Pellets and Bioethanol
• Presenting author: Cuong Dao, University of Saskatchewan, Saskatoon, Saskatchewan Canada (Cuong Dao, Lope Tabil, Edmund Mupondwa, Tim Dumonceaux) 1901268

10:35am BREAK

10:45am Thermal Properties of Microwave-Assisted Torrefied Pellets from Agricultural Residues
• Presenting author: Obiora Agu, University of Saskatchewan, Saskatoon, Saskatchewan Canada (Lope G. Tabil, Edmund Mupondwa) 1900936

11:00am Quench Coating of Water Resistant Binders to Improve the Durability of Torrefied Biomass Pellets
• Presenting author: Jaya Shankar Tumuluru, Idaho National Laboratory, Idaho Falls, Idaho, MS (Nalladurai Kaliyan, Maryam Manouchehrinejad, Kamalakanta Sahoo, Jaya Shankar Tumuluru, Sudhagar Mani) 1901768

11:15am Drying Biomass Feedstock Materials in a Down-Draft Belt Dryer
• Presenting author: David Lanning, Forest Concepts LLC Auburn, WA (Christopher Lanning, James Slosson, James Dooley, Jordai Whitt) 1900826

11:30am Determination of Fundamental Mechanical Properties and Modeling the Flow Behavior of Biomass Feedstocks Using the Cubical Triaxial Tester
• Presenting author: Hojae Yi, The Pennsylvania State University, University Park, PA (Virendra Puri, Christopher Lanning, James Dooley) 1900929

11:45am Wear and Why? How Ash Elements Can Help Define Wear Profiles of Biomass Feedstocks
• Presenting author: Jeffrey A. Lacey, Idaho National Laboratory, Idaho Falls, ID (Jeffrey A. Lacey, John E. Aston, Sergio Hernandez, Vicki S. Thompson, Mary S. Intwan, Kyungjin Lee, Jun Qu) 1901446

12:00pm Effect of Wet Explosion Pretreatment in Enhancing Biogas Production of Wheat Straw
• Presenting author: Muhammad Usman Khan, Washington State University, Richland, WA (Muhammad Usman Khan, Birgitte Kjaer Ahring) 1900910

NO-SHOW Development of Pre-Treatment Chamber for Biofuel Production
• Presenting author: B.A Adelekan, Federal College of Agriculture, Ibadan, Oyo State Nigeria (A.I. Bamgboye, B.A. Adelekan) 1901522

204 Renewable Energy Resources and Technologies
Tuesday, July 9, 9:30am-12:00pm
Location: Boston University
Sponsored by: ES-210
Moderator: Hongjin Lin, University of Minnesota, St. Paul, MN

9:35am Comprehensive Evaluation of a Landscape Fabric Based Solar Air Heater in a Pig Nursery
• Presenting author: Sanjay B. Shah, North Carolina State University, Raleigh, NC (Li Yu, Sanjay Shah, Mark Knauer, Mike Boyette, Larry Stikeleather) 1901499

9:50am Life Cycle Assessment of Biogas Production in Small-Scale in Columbia
• Presenting author: Omar Hijazi, Technical University of Munich, Agricultural Systems Engineering, Freising, Germany (Omar Hijazi, Sonja Mettenleiter, Mohammed Samer, Essam Abdelsalam, Jochen G. Wiecha, Kathrin L. M. Ziegler, Heinz Bernhardt) 1900099

10:05am The Mixing Power Required for Hydrolysis and Fermentation of Lignocellulosic Biomass in Horizontal and Vertical Reactor: Experimental and Technoeconomic Analysis
• Presenting author: Haider Kadhum, Oregon State University, Corvallis, OR (Haider J. Kadhum, G. S. Murthy) 1900459

10:20am Fuel Cell Grade Hydrogen Gas Production from Corn
• Presenting author: Ozge Nayman Tiryaki (Ozge Nayman Tiryaki, Sibel Irmak) 1901818

10:35am BREAK

10:45am Production of Cardboard Based Char for Improved Agricultural Productivity in Northern Remote Regions with Some Energy Recovery
• Presenting author: Sebastian Fricke, McGill University, Montreal, Quebec, Canada (Shiv Prasher) 1901596

NO-SHOW Effects of Microbial Pretreatment on Delignification of Camelina Straw and Switchgrass to Enhance Enzymatic Hydrolysis
• Presenting author: Cuong Dao, University of Saskatchewan, Saskatoon, Saskatchewan Canada (Cuong Dao, Lope Tabil, Edmund Mupondwa, Tim Dumonceaux) 1901270

NO-SHOW Conductive Ink Printed Co3O4 and Fe3O4 – Ideal Cathode Catalyst for Microbial Fuel Cell to Improve Bio-Energy Recovery
• Presenting author: Gourav Dhar Bhowmick, McGill University, Montreal, Quebec, Canada (Shiv Prasher) 1901596

11:30am Bio-Oil Production by Intermediate Pyrolysis Using an Auger Reactor: Optimization through Response Surface Methodology (RSM)
• Presenting author: Brenda Alvarez Chavez, McGill University, Sainte-Anne-de-Bellevue, QC, Canada (Stephane Godbout, Joahnn Palacios, Etienne Le Roux, Vijaya Raghavan) 1901728

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Tuesday, July 9

11:45am  Effect of Crop and Machine Parameters on Mechanical Harvesting of Paddy  • Presenting author: Arjya Utkalini Sahoo, Research Scholar, IIT Kharagpur, Kharagpur, West Bengal, India (Arjya Utkalini Sahoo, Hijjur Raheman) 1901067


12:15pm  Optimization of Applied Voltage for Electrochemical Hydrogen Sulfide Removal from Biogas  • Presenting author: Hongjian Lin, Zhejiang University, Hangzhou China (Hongjian Lin) 1901566

205 Strategies for Safety Communication and Education
Tuesday, July 9, 9:30am-12:00pm
Location: MIT
Sponsored by: ESH-04/1; EOPD-205; EOPD-208; ESH-04/1
Moderator: Gretchen Mosher, Iowa State University, Ames, IA

9:35am  Tractor Operation and Safety Program for Women in Agriculture  • Presenting author: Dee Jepsen, The Ohio State University, Columbus, OH

9:50am  NIFA Funding Opportunities for Agricultural Safety and Health  • Presenting author: Salah Issa, USDA NIFA, Washington, DC (Salah Issa, Bradley Rein, Steven Thomson) 1901922

10:05am  Intersects and Disconnects for Worker Safety and Pig Welfare during Different Pork Production Stages  • Presenting author: Heather Vanheeswijk, University of Illinois, Plainfield, IL (Heather N. Vanheeswijk, Angela R. Green-Miller) 1901405

10:20am  Safety in Agriculture for Youth: Maintaining a National Clearinghouse  • Presenting author: Aaron M. Yoder, PhD, University of Nebraska, Omaha, NE (Aaron M. Yoder, Alyssa Damke) 1901500

10:35am  BREAK

10:45am  Development of Test Method for Measuring Assistive Torque of the Powered Exoskeleton for Farming  • Presenting author: Masahiro Tanaka, NARO, Saitama-city, Saitama, Japan (Masahiro Tanaka, Yutaka Kikuchi, Satoru Umeno) 1900990

11:00am  Developing and Testing an Autonomous All-Terrain Vehicle to Experimentally Simulate Rollover Accidents  • Presenting author: Hsiao-Yang Chou, University of California-Davis, Davis, CA (Hsiao-Yang Chou, Farzaneh Khorsandi) 1901456

11:15am  Preliminary Analysis on the Agricultural Production Technological Growth Impact on Agricultural Safety and USDA NIFA Contributions to a Safer Workplace  • Presenting author: Salah Issa, USDA NIFA, Washington, DC (Salah Issa, Bradley Rein, Steven Thomson) 1901923

11:30am  Strategies for an Agricultural Safety Instructor Outreach and Communications Program  • Presenting author: Michael Pate, Penn State University, University Park, PA

206 ITSC—Information Technology, Sensors & Control Systems POSTER SESSION
Tuesday, July 9, 9:30am-12:00pm
Posters will be displayed for the entire session, but authors will be present at posters as follows:
9:30am-10:45am, authors with ODD numbered posters present
10:45am-12:00pm, authors with EVEN numbered posters present
Location: Gloucester
Sponsored by: ITSC-01
Moderator: Daniel Jenkins, University of Hawaii, Honolulu, HI

1  A Feature Extraction Approach Based on Hough Transform to Estimate Growth Responses of Leaf Lettuce  • Presenting author: Chung-Liang Chang, Department of Biomechatronics Engineering, National Pingtung University of Science and Technology, Pingtung County, Taiwan R.O.C. (Wei-Lun Fu) 1900275

2  Detection of Three Fruit Maturity Stages in Wild Blueberry Fields Using Deep Learning Artificial Neural Networks  • Presenting author: Craig MacEachern, Dalhousie University Faculty of Agriculture, Bible Hill, Nova Scotia Canada (Arnold W. Schumann, Negar S. Mood, Perseveranca D.K. Munoga, Craig MacEachern, Qamar U. Zaman, Travis Esau) 1900533

3  Investigating the Development of Aspergillus flavus Inoculated on Maize Kernels Using Visible and Near Infrared Hyperspectral Imaging  • Presenting author: Yi Wang, UC Davis, CA (Beibei Jia, Wei Wang, Xinzi Ni, Yi Yang, Xin Zhao, Hongzhe Jiang) 1901603

4  Deriving Vegetation Indices from High-Throughput Images by Using Unmanned Aerial Systems in Soybean Breeding  • Presenting author: Beichen Lyu, Department of Agricultural & Biological Engineering, Purdue University, West Lafayette, IN (Beichen Lyu, Stuart D. Smith, Xiyang Xue, Keith A. Cherkauer) 1900280

5  Designing a Perception System for Safe Autonomous Operations in Agriculture  • Presenting author: Changjoo Lee, Sensor-Technik Wiedemann GmbH, Kaufbeuren, Bayern, Germany (Changjoo Lee, Stefan A Lang, Heinz Bernhardt) 1900696

6  Model Fusion for Non-destructive Prediction of Intramuscular Fat in Pork Loin Using Hyperspectral Imaging  • Presenting author: Christopher Kucha, McGill University, Ste Anne de Bellevue, Quebec Canada (Christopher Kucha, Li Liu, Michael Ngadi) 1901866

7  Nondestructive Detection of S-Ovalbumin Content during Eggs’ Storage Using Visible/Near-Infrared Spectroscopy  • Presenting author: Dandan Fu, College of Engineering, Huazhong Agricultural University, Wuhan, Hubei China (Dandan Fu, Qiaohua Wang, Meihu Ma, Sheng Gao,Yixiao Ma) 1901243

8  An Application of Face Recognition Based on Gaussian Processes  • Presenting author: Qingyun Sun, China Agricultural University, Beijing, China (Feixiang Zhang, Weifeng He, Xueru Yu, Qingyun Sun) 1901521

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Tuesday, July 9

9 Kinematics Analysis and Simulation of Greenhouse Vegetable Transplanting Robot • Presenting author: Shixiong Li, China Agricultural University, Beijing, China (Haotun Lyu, Lina Zhang, Luhai Chen, Zhang Xiao, Shixiong Li, Yu Tan) 1901029

10 Greenhouse Intelligent Recognition and Replanting Control System Based on Machine Vision • Presenting author: Shixiong Li, China Agricultural University, Beijing, China (Zhang Xiao, Xingxing Liu, Shixiong Li, Gang Wu, Yu Tan) 1901021

11 Design and Implementation of Biogas Production Monitoring System • Presenting author: Xingxing Liu, China Agricultural University, Beijing China (Haotun Lyu, Honghao Liu, Shixiong Li, Xingxing Liu, Yu Tan, Jianping Li) 1901017

12 Automatic Recognition of Potato Germ Based on AdaBoost Algorithm • Presenting author: Xingxing Liu, China Agricultural University, Beijing China (Liu Yang, Luhai Chen, Fang Tian, Shixiong Li, Yu Tan) 1901019

13 Method of Identification of Crop Nutrition Status Based on Convolutional Neural Network • Presenting author: Xiaolong Li, China Agricultural University, Beijing China (Haoyun Lyu, Xiaolong Li, Zi Zheng, Shenghui Yang, Xingxing Liu, Yongjun Zheng) 1901014

14 Development of a Raspberry Pi Based Pest Detection Device for Use in Livestock Feed Storage Systems • Presenting author: Hidehiko Inoue, Institute of Agricultural Machinery NARO, Saitama-shi, Saitama-ken, Japan (Hidehiko Inoue) 1900337

15 Research on Relative Height Detection System of Plant Protection UAV Based on Kalman Filter • Presenting author: Shenghui Yang, China Agricultural University, Haidian District, Beijing, China (Jianping Li, Qinghao Liu, Hongchao Wang, Zi Zheng, Shenghui Yang, Yongjun Zheng) 1901023

16 CFD Models and Verification of the Downwash Airflow of an Eight-Rotor UAV • Presenting author: Shenghui Yang, China Agricultural University, Haidian District, Beijing, China (Shenghui Yang, Xingxing Liu, Bingtai Chen, Shixiong Li, Yongjun Zheng) 1901018

17 Measurement of Moisture Content of Peanut (Arachis hypogaea Linn.) Using Near Infrared Hyperspectral Imaging Technique • Presenting author: Jose D. Guzman, Cagayan State University, Tuguegarao City, Cagayan, Philippines (Jose D. Guzman, Jennyfer D. Rabanera) 1901366

18 Sensorsystems in German Dairy Farming—Aspects of Hardware Design and Sustainability • Presenting author: Heinz Bernhardt, Technical University of Munich, Freising, Germany (Josef Bauerdick, Maximilian Treiber, Martin Höhendinger, Omar Hijazi, Natascha Schlereth, Heinz Bernhardt) 1900739

19 Using Artificial Neural Networks to Differentiate Spectral Signatures of Potato Plants Infected with Potato Virus Y • Presenting author: L. Michael Griffel, Idaho National Laboratory, Idaho Falls, ID (L. Michael Griffel, Donna Delparte, Paul Bodily) 1901827

20 Design of Software of Prescription Map for Precise Fertilization • Presenting author: Liu Honghao, China Agricultural University, Beijing, China (Li Shixiong, Chen Yuhang, Wan Chang, Liu Honghao, Zheng Yongjun, Yang Liu) 1901048

21 Development on a New Free-Drilling Stage Cementing Tool • Presenting author: Yin Yiyong, China Agricultural University, Beijing China (Yin Yiyong, Bai Hanqin, Xiang Hang) 1900375

22 Design and Laboratory Experiment of a New Downhole Vibration Cementing Tool • Presenting author: Yin Yiyong, China Agricultural University, Beijing China (Liu Binhui, Bai Weikun, Feng Yusi, Yuan Xiong, Li Junpeng, Yin Yiyong) 1900374

23 Wireless Monitoring System of Working Load of Tractors Based on ZigBee • Presenting author: Li Xiaolong, China Agricultural University, Beijing, China (Lyu Haotun, Zheng Zi, Zhang Ran, Tan Yu, Liu Xingxing, Li Xiaolong, Li Shixiong) 1900732

24 LAN-Based Monitoring System for Agricultural Device Load • Presenting author: Li Xiaolong, China Agricultural University, Beijing, China (Yang Liu, Chen Xingwang, Zhang Ran, Tan Yu, Li Xiaolong, Li Jianping) 1901024

25 Florida Polytechnic University’s Intelligent Garden—Phase II • Presenting author: Melissa Morris, Florida Polytechnic University, Lakeland, FL (Melissa Morris, Beverly Butler, Grant Percy, Nicoleta Hickman) 1901491

26 Designing Reliability Sensor for the Maintenance of CNC Machines and Agricultural Machinery • Presenting author: Osarenren John O, Bronx, New York (Osarenren, J.O) 1901546

27 Using UAV and Thermal/Multispectral Imagery to Determine Soil Moisture in Red River Valley • Presenting author: Talon Mack, North Dakota State University, Fargo, ND (Talon Mack, Paulo Flores, Xinhua Jia, Xin Sun) 1901455

28 Hydraulic System Simulation of Ditching Depth Automation Control • Presenting author: Liu Xingxing, China Agriculture University, Beijing, China (Wan Chang, Tan Yu, Yi Xiaokang, Liu Xingxing, Ma Xueling, Liu Honghao) 1901062

29 Developing an Advanced Multi-Parameter Monitoring System for Wireless Real-Time Monitoring and Traceability of Chilled Chicken in Cold Chain • Presenting author: Xinwu Li, China Agricultural University, Beijing, China (Xinwu Li, Mira Trebar, Xue Liu, Zhenbo Li, Yafei Wu, Xiaoshuan Zhang) 1901140

30 Optimized Faster R-CNN for Fruit Detection of Strawberry Harvesting Robot • Presenting author: Yang Yu, China Agricultural University, Beijing China (Yang Yu, Kaillang Zhang, Dongxing Zhang, Li Yang, Tao Cui) 1901123

31 Prediction of Quality Attributes of Chicken Breast Fillets by Using Hyperspectral Imaging Technique Combined with Deep Learning Algorithm • Presenting author: Yi Yang, China Agricultural University, Beijing China (Yi Yang, Wei Wang, Hong Zhuang, Seung-chul Yoon, Brian Bowker, Hongzhe Jiang) 1901301

32 Discrimination of Cotton Plants Damaged by Cotton Bollworm of Different Instars Based on Electronic Nose Use • Presenting author: Yuting Dai, Zhejiang University, Hangzhou, Zhejiang, China (Yuting Dai, Bo Zhou, Jun Wang) 1900521

33 Enhancing Charge Transport in Enzymatic Bio-Electrodes Using Iron-Sulfur-Based Molecular Wires • Presenting author: Aishwarya Mahadevan, Texas A&M University, College Station, TX (Aishwarya Mahadevan, Sandun Fernando) 1901647

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34 Sub-surface Water Sampling Cartridge Design for Unmanned Aerial Vehicles • Presenting author: Ali Koc, Clemson University, Clemson, SC (Cengiz Koparan, Bulent Koc) 1900816

35 Development of an Image-based System to Assess Nutrient Contents of Food • Presenting author: Babatunde Onadipe, Biosource Engineering Department, Sainte Anne de Bellevue, Quebec Canada (Michael Ngadi, Ebenezer Kwofie) 1901773

36 High Sensitive Raman Imaging for Rapid and Nondestructive Analysis of Powdered Food • Presenting author: Byoung-Kwan Cho, Chungnam National University, Daejeon South Korea (Santosh Lohumi, Oh-Tae Kwon) 1900384

37 Data Analytics for Effective Stored Grain Management • Presenting author: Clairmont Clementson, Purdue University, West Lafayette, IN (Klein Ileleji) 1901242

38 Development of a Machine Vision Algorithm for Japanese Apricot Fruit Detection and Size Estimation Using 3D Point Cloud • Presenting author: Daen Choi, Dept. of Ag and Bio Engineering, Penn State University, University Park, PA (Hyuck-Joo Kim, Won Suk Lee, Gyeong Jang) 1901348

39 Fast Measurement of Nutritive Values in Soybean Using Reflective Hyperspectral Imaging • Presenting author: Dandan Fu, Huazhong Agricultural University, Wuhan China (Dandan Fu, Jianfeng Zhou, Andrew Scaboo) 1900386

40 Comparison of Prediction Models of Sugar Content Based on Species, Regions, and Spectral Resolutions for Hardy Kiwis (Actinidia arguta) • Presenting author: Giyoung Kweon, Gyeongsang National University, Jinju, Gyeongnam, South Korea (Sangyoon Lee, Youngki Park, Jaeyeeong Yang) 1901041

41 Spectral Difference Analysis and Identification of Different Maturity Blueberry Fruit Based on Hyperspectral Imaging Using Spectral Index • Presenting author: Hao Ma, Henan University of Science and Technology, Luoyang City, Henan Province China (Ma Hao, Zhao Kaixuan, Jin Xin, Ji Jiangtao, Qiu Zhaomei) 1900503

42 Precision Irrigation Strategies for Sustainable Potato Production in Prince Edward Island • Presenting author: Hassan Afzaal, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada (Altazaz Farooque, Qamar Zaman, Bishnu Acharya, Travis Esau, Nazar Hussain) 1900380

43 Development of High Throughput Phenotyping System for Plant Breeding • Presenting author: James Kim, Arid-Land Agricultural Research Center, Maricopa, AZ (James Y Kim, Hussein Abdel-Haleem, Alison Thompson, John Dyer) 1901884

44 Roadmap to High Throughput Phenotyping • Presenting author: James Kim, Arid-Land Agricultural Research Center, Maricopa, AZ (James Y Kim, John Dyer) 1901886

45 Prediction of Apple Fruitlet Drop by Vis-NIR Spectroscopy • Presenting author: Jenny Orlova, Technion- Israel Institute of Technology, Haifa, Israel (Raphael Linker, Boris Spektor) 1900407

46 Reconstruction of Three-dimensional Model of Peach Tree • Presenting author: Jiangtao Qj, Jinlin University, Changchun, Jinlin, China (Jiangtao Qj, Hongli Tian, Huibin Sun, Linhuan Zhang, Yang Li) 1901709

47 Automatic Food Sample Evaluation Using a Combined 785 and 1064 nm Raman Spectral Imaging System • Presenting author: Jianwei Qin, USDA ARS, Beltsville, MD (Jianwei Qin, Moon S. Kim, Kuanglin Chao, Jeehwa Hong, Insuck Baek, Sagar Dhakal, Byoung-Kwan Cho) 1901896

48 Anticipatory Defence for Agricultural Drought Forecasting and Warning System Using a Real Time Water-Level • Presenting author: Jong-Won Do, Korea Rural Community Corporation, Daejon, Republic of Korea (Jong-Won Do, Bo-Sung Koh, Kwang-Ya Lee, Tae-Hyun Ha, Seung-Yong Lee, Eui-Yup Jung) 1900965

49 Classification of Different Freeze-Damaged Corn Seed Using Hyperspectral Reflectance Imaging Combined with Deep Convolutional Neural Network • Presenting author: Jun Zhang, Zhejiang University, Hangzhou, Zhejiang Province China (Limin Dai, Zhilin Zhao, Fang Cheng) 1900743

50 Non-Destructive Determination of Crude Fiber in Food and Agricultural By-Products • Presenting author: Junhee Kim, Kyungpook National University, Daegu, South Korea (Seungmim Woo, Junhee Kim, Yeongsu Kim, Tusan Park, Yushin Ha) 1900959

51 Canopy Structural Patterns for Identifying Stress and Yield Variability in Tobacco and Sorghum • Presenting author: Kellyn Montgomery, NC State, Raleigh, NC (Josh Henry, Helena Mitasa) 1901336

52 Automated Bioreactor System with Physical Cues for Controlled Stem Cells • Presenting author: Ki-Taek Lim, Kangwon National University, Chuncheon, Gangwon, Republic of Korea (Ki-Taek Lim) 1901418

53 Use of Handheld Near Infrared Spectrometer and Partial Least Squares Regression to Quantify Metanil Yellow Adulteration in Turmeric Powder • Presenting author: Mary-Grace Danao, University of Nebraska-Lincoln, Lincoln, NE (Isaac Rukundo, Mary-Grace C. Danao, Curtis L. Weller, Randy L. Wehling, Kent M. Eskridge) 1900458

54 Performance Evaluation of Two Commercially Available Produce Quality Spectrometers • Presenting author: Md Abdul Momin, University of California, Davis, CA (Constantino Valero, Irwin Donis Gonzalez) 1900247

55 Unmanned Aerial Vehicle (UAV) Based Remote Sensing for Monitoring Cassava (Manihot Esculenta Crantz) Growth and Development • Presenting author: Milton Valencia, CIAT, Pamira, Valle del Cauca, Columbia (Milton Orlando Valeria, Alejandro Vergara, Diego Guzman, Michael Gomez Selvara) 1901972

56 On-Line Monitoring of FDM Based on Machine Vision • Presenting author: Min Zhou, China Agricultural University, Beijing, China (Min Zhou) 1900211

57 Proximal Sensing of Grape Soluble Solids Content • Presenting author: Peter Schaare, Plant and Food Research, Hamilton, Waikato New Zealand (Peter Schaare) 1900208

58 Development of Portable NIR Spectrum for On-line Quality Detection of Agricultural Products • Presenting author: Quansheng Chen, Jiangsu University, Zhenjiang, Jiangsu China (Quansheng Chen, Huanhuan Li, Zhiiming Guo) 1900364

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59 Spatially Resolved Spectroscopy Coupled with a Spectral Difference Technique for Predicting Internal Quality of Peaches
  • Presenting author: Renfu Lu, USDA/ARS/MWA/SBRU, Michigan State University, East Lansing, MI (Yuping Huang, Renfu Lu) 1900433

60 Comparison of UAV-Based Thermal Imaging for Locating Drain Tile Outlets in Overgrown Drainage Ditches
  • Presenting author: Robert Freeland, University of Tennessee, Knoxville, TN (Robert Freeland, Barry Allred, Luis Martinez, DeBonne Wishart, Greg Rouse) 1901879

61 FT-IR Spectroscopic Method Coupled with Chemometrics for Detection of Chemical Adulterants in Spice Powder
  • Presenting author: Sagar Dhakal, USDA-ARS, Beltsville, MD (Sagar Dhakal, Walter Schmidt, Jianwei Qin, Moon Kim, Kuanglin Chao) 1901895

62 Phosphorene-Gold Nanocomposite Based Microfluidic Apatasensor for the Detection of Okadaic Acid
  • Presenting author: Saipriya Ramalingam, University of Guelph, Guelph, Ontario Canada (Saipriya Ramalingam, Ashutosh Singh) 1901185

63 Near Infrared (NIR) Spectroscopy for Rapid Analysis of Chemical Composition of Corn Stover
  • Presenting author: Seyed Hashem Mousavi Avval, The Ohio State University, Wooster, OH (Ayaj Shah) 1901660

64 Coffee Flavor Prediction: Using Deep Learning Methods on Near-Infrared Spectroscopy (NIRS)
  • Presenting author: Shih-Fang Chen, National Taiwan University, Taipei Taiwan (Yu-Tang Chang, Shu-Pin Hung, Chih-Cheng Lu, Jia-Hung Peng, Shih-Fang Chen) 1901099

65 Air-Driven Lens Clearing for Visual Sensing in Agricultural Environments
  • Presenting author: Sierra Young, North Carolina State University, Raleigh, NC (Joshua Peschel) 1901139

66 Advancing Remote Manipulation with Unmanned Aerial Vehicles for Agricultural Applications
  • Presenting author: Sierra Young, North Carolina State University, Raleigh, NC (Joshua Peschel, Ryan Lanciloti) 1901153

67 NIR-Based Fruit Ripeness Sensor Embodiments Using Low-Cost LEDs and Photodiodes
  • Presenting author: Sim Harbert, Georgia Tech Research Institute, Atlanta, GA (Samarthya Bhatnagar, Melissa Gordon, Cindy Hall, Dennis Hernandez, Angus MacLean, Margarite Picone, Tynan Purdy, Hyoungjin Sim, Giancarlo Tissot, Ai-Ping Hu) 1900580

68 Predicting Soil Properties Using a VNIR Library: Comparison of Modeling Techniques
  • Presenting author: Suresh Thapa, University of Nebraska-Lincoln, NE (Nwunw Wijewardane, Abbas Atefi, Yufeng Ge, Hongfeng Yu) 1901733

69 NIR/MIR Spectroscopy in Tandem with Chemometrics for Rapid Identification and Evaluation of Potato Variety and Doneness Degree
  • Presenting author: Wen-Hao Su, University of California-Davis, Davis, CA (Serafim Bakalis, Da-Wen Sun) 1900120

70 Advanced Applications of Near/Mid-Infrared (NIR/MIR) Imaging Spectroscopy for Rapid Prediction of Potato and Sweet Potato Moisture Contents
  • Presenting author: Wen-Hao Su, University of California-Davis, Davis, CA (Serafim Bakalis, Da-Wen Sun) 1900121

71 Research on Control Strategy Combining Autonomous Navigation and Multitasking for Greenhouse Operating Platform
  • Presenting author: Xiangqian Dong, China Agricultural University, Beijing, China (Chao Wang, Jiao Song, Xiangqian Dong, Yu Chen) 1900629

72 Ambient and Laboratory Evaluation of Two Low-cost Particulate Matter Sensors
  • Presenting author: Yi Liang, University of Arkansas, Fayetteville, AR (Yi Liang, Zack Wofford) 1900168

73 Determination and Evaluation of Quality and Safety for Fruit Using Spectroscopic and Imaging Techniques
  • Presenting author: Zhiming Guo, Jiangsu University, Zhenjiang, Jiangsu China (Zongbao Sun, Xiangbo Zou, Qin Ouyang, Shih-Fang Chen, Xianbo Zou, Jinwen Zhao) 1900317

74 Detection of Salmon Quality by Impedance Properties and Chemometrics
  • Presenting author: Zongbao Sun, Jiangsu University, Zhenjiang, Jiangsu Province, China (Zongbao Sun, Liming Liang, Xiaobo Zou, Xianbo Zou, Tianzhen Wang, Yiwei Xu, Xiaoyu Liu, Jinkui Li) 1900805

75 Advances of Computational Fluid Dynamics (CFD) in Agricultural and Biosystems Engineering
  • Presenting author: Wey Ling Ong, University of Wisconsin-Madison, Madison, WI (Wey Ling Ong, Chahinez Dab, Seunghyeon Jung, Christopher Choi) 1901845

76 Research on Recognition Methods of Pomelo Fruit Hanging on Trees Based on Machine Vision
  • Presenting author: Jie Liu, Huazhong Agricultural University, Wuhan, Hubei, China (Xie Hang, Dai Ning, Yang Xiaoju, Zhan Kun, Liu Jie) 1900411

77 Recognition of Cutting Region for Pomelo Picking Robot Based on Machine Vision
  • Presenting author: Jie Liu, Huazhong Agricultural University, Wuhan, Hubei, China (Dai Ning, Xie Hang, Yang Xiaoju, Zhan Kun, Liu Jie) 1900412

78 Automatic Crop Recognition Based on Geometric Appearance for a Non-Chemical Robotic Weed Control System in a Tomato Field
  • Presenting author: Rekha Raja, University of California Davis, Davis, CA (Rekha Raja, David Slaughter, Steven Fennimore) 1900028

79 Review of Vision Systems Application on Yield Mapping
  • Presenting author: Shirin Ghatrehsamani, University of Florida, Gainesville, FL (Shirin Ghatrehsamani, Yiannis Ampatzidis) 1900804

80 Image-Based Automated Trap Surveillance for Coconut Rhinoceros Beetle
  • Presenting author: Daniel Jenkins, University of Hawaii, Honolulu, HI (Daniel Jenkins, Michael Melzer, Shizu Watanabe) 1901674

81 Detection of Miconia calvescens DC in Hawaiian Forests with Convolutional Neural Networks
  • Presenting author: Daniel Jenkins, University of Hawaii, Honolulu, HI (Roberto Rodriguez, James Leary, Daniel Jenkins, Ryan Perroy) 1901672

82 Establishment of Nozzle Static Atomization and Droplets Rebound Model for Forest Barrier Treatment
  • Presenting author: Wang Yaxiong, Beijing Forest University, Beijing, China (Wang Yaxiong, Kang Feng, Li Wenbin) 1900793

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83 Numerical Simulation on the Asymmetric Irrigation Sprinkler Jets with LES Method · Presenting author: Lin Hua, Jiangsu University, Zhenjiang, Jiangsu, China (Lin Hua, Hong Li, Yue Jiang) 1901068

84 Fruit Yield Prediction Using Artificial Intelligence · Presenting author: Duke Bulanon, Northwest Nazarene University, Nampa, ID (Tanner Tracht, Garrison Cizmich, Joseph Bulanon, Brice Allen) 1900776

85 Pine Seedlings Detection and Tallying Using Deep Neural Networks · Presenting author: Kadeghe Fue, University of Georgia, Tifton, GA (Kadeghe Fue, Gina Bishop, Glen Rains) 1900369

86 Semantic Segmentation of Crop and Weed Using an Encoder-Decoder Network under Uncontrolled Outdoor Illumination · Presenting author: Aichen Wang, Jiangsu University, Zhenjiang, Jiangsu China (Yifei Xu, Xinhua Wei) 1901033

87 A New Turfgrass Evaluation Method Based on Two-Stage K-Means Color Classifier · Presenting author: Ping Xu, Hangzhou Dianzi University, Hangzhou, Zhejiang, China (Ping Xu, Ning Wang, Xian Zheng, Guangjun Qiu, Bin Luo) 1901754

88 Determining the Shape of the Cordon for Automated Green Shoot Thinning in Vineyards Using Semantic Segmentation-based Deep Learning Networks · Presenting author: Yaqoob Majeed, Washington State University, Prosser, WA (Yaqoob Majeed, Xin Zhang, Longsheng Fu, Manoj Karkee, Qin Zhang) 1901314

89 Probabilistic Localization of Autonomous Vehicles Inside Orchard Rows · Presenting author: Zhenghao Fei, University of California, Davis, Davis, CA (Stavros Vougioukas) 1900378

90 Development of Automatic Milking in Germany · Presenting author: Heinz Bernhardt, Technical University of Munich, Freising, Germany (Heinz Bernhardt, Martin Höhendinger, Anja Gräß, Omar Hijazi, Manfred Höld, Matthias Rege, Jörn Stumpenhausen) 1900127

91 Plant-Stand Count and Spatial Distribution Mapping from UAV Images · Presenting author: S. Sunoj, North Dakota State University, Fargo, ND (S. Sunoj, C. Ithaginathane, P. J. Flores, H. Sidhu, E. Monono, D. Wiesenborn, D. Archer) 1901259

92 A Novel Farmland Boundaries Extraction and Obstacle Detection Method Based on Unmanned Aerial Vehicle · Presenting author: Wang Aichen, Jiangsu University, Zhenjiang, Jiangsu Province China (Zhang Min, Li Lin, Wang Aichen, Wei Xinhua) 1900369

93 Unmanned Aerial Vehicle Based Remote Sensing for Detection of Cranberry Insect Pests · Presenting author: Brian Luck, University of Wisconsin-Madison, Madison, WI (Jessica L. Drewry, Elissa M. Chasen, Shawn A. Steffan) 1901761

94 Using Flight and Field Datasets with Digital Photogrammetric Systems to Assess the Accuracy of a UAS Sensor Platform for Mapping Geospatial Input Treatment Zones · Presenting author: Charles A. Collins, North Carolina State University, Raleigh, NC (Gary Roberson, Scott Hale) 1900366

95 Estimating Forage Dry Matter and Nutritive Value Using UAV- and Ground-Based Sensors—A Preliminary Study · Presenting author: Kim Nee Vong, Division of Food Systems and Bioengineering, University of Missouri, Columbia, MO (Chin Nee Vong, Jianfeng Zhou, Joshua A. Tooley, Harley N. Naumann, John A. Lory) 1900556

96 Power Tethered UAS Network for Automated Indefinite Data Acquisition to Assist Agricultural Management and Production · Presenting author: Daniel Anthony Rico, University of Nebraska—Lincoln, Lincoln, NE (Francisco Munoz Arriola, Carrick Detweiler) 1901690

97 Radiometric Accuracy of UAV-Based Image Mosaics with Automatic vs. Manual Exposure Settings · Presenting author: G. Cody Bagnall, Texas A&M University, College Station, TX (J. Alex Thomasson, Chao Sima, Cristine L.S. Morgan, Chenghai Yeng) 1901152

98 Development of Automatic Variable Rate Spraying System for Low Altitude Unmanned Aerial Vehicles · Presenting author: Han Guo, Zhejiang University, Hangzhou, Zhejiang Province, China (Fei Liu, Fong Cao, Jiangan Shen, Xiaolong Li, Yong He) 1900991

99 Predicting Quality and Yield of Growing Alfalfa from a UAV · Presenting author: Joseph Dvorak, University of Kentucky, Lexington, KY (Joseph Dvorak, Luis Felipe Pampolini, Hasan Seyedehasani, Josh Jackson, Ben Goff, Michael Sama) 1901698

100 Characterization of NDVI Red to NDVI Blue in Crops with Low Cost UAV and Drone Systems · Presenting author: Randy Price, LSU AgCenter, Alexandria, LA (Dustin Harrell) 1901544

101 In-Situ Calibration of UAS Thermal Imagery · Presenting author: Ryan Phillips, NC State University, Raleigh, NC (Jason Ward) 1901477

102 UAV Image-Based Weed Detection in Grassland Toward Site-Specific Weed Control · Presenting author: Ryo Sugiuara, NARO, Tsukuba, Ibaraki, Japan (Ryo Sugiuara, Kazufumi Fujiwara) 1900620

103 Virtual Reality Poultry Debone Cutting Optimization · Presenting author: Simeon Harbert, Georgia Tech Research Institute, Atlanta, GA (Simeon Harbert, Louise Zhuang, Konrad Kahlin, Stephanie Richter, Wayne Daley) 1901751

104 Automatic Plot Extraction in Field Crop Trials Using Digital Image Processing from UAV Images · Presenting author: Sunoj Shajahan, North Dakota State University, Bismarck, ND (Sunoj Shajahan, Ithaginathane Cannayen, Paulo Flores) 1901263

207 Automated Agricultural Field Machinery Data Collection, Analysis, and Utilization
Tuesday, July 9, 9:30am-12:00pm
Location: Harvard
Sponsored by: MS-58; MS-54
Moderator: Aaron Franzen, South Dakota State University, Brookings, SD

9:35am Development of Tractor Three-Point Hitch Type Dynamometer (I)—Kinematic Analysis · Presenting author: Hyo-Geol Kim, Korea Institute of Industrial Technology, Gimje, Jeollabuk-do, Republic of Korea (Yeon-Soon Kim, Sung-Bo Shim, Young-Joo Kim, Sang-Dae Lee) 1900209
Tuesday, July 9

9:50am  **The Performance Analysis of Tactile and Ultrasonic Sensors for Planting, Fertilizing, and Cultivating Cover Crops**  
- Presenting author: Nadia Delavarpour, NDSU, Fargo, ND (Sulaymon Eshkabilov, Thomas Bon, John Nowatzki, Sreekala Bajwa) 1901247

10:05am  **Prediction of Implement Hydraulic Power Requirements for Small Grain Planting Field Operation**  
- Presenting author: Gabriel Stoll, University of Nebraska-Lincoln, Lincoln, NE (Joe Luck, Santosh Pitta) 1901198

10:20am  **Tractor Instrumentation System for Characterizing Mixed Mode Tractor Power States**  
- Presenting author: CheeTown Liew, University of Nebraska-Lincoln, Lincoln, NE (CheeTown Liew, Santosh Pitta, Rodney Rohrer, Joe Luck, Roger Hoy) 1901487

10:35am  **BREAK**

10:45am  **Investigating Effects of Interaction of Single Tine and Rotating Tine Mechanism with Soil on Weeding Performance Using Simulated Weeds**  
- Presenting author: Safal Kshetri, Iowa State University, Ames, IA (Jafni J. Jiken, Brian L Steward, Lie Tang, Mehari Tekeste) 1901537

11:00am  **Design of Plying Traction Output Device**  
- Presenting author: Liu Jingjing, Shihzei University, Shihzei, Xinjiang, China (Shuai Li, Huijuan Bai, Jianing Wang, Haodong Yue, Pufei Yang, Jingjing Liu) 1900441

11:15am  **Draught Prediction Models for Tillage Tines in Two Prominent Agricultural Soils in Borno State, Nigeria**  
- Presenting author: Eli Mamman, University, Maiduguri, Borno, Nigeria (Eli Mamman) 1900391

11:30am  **The Effect of Width and Rake Angle on Draught and Soil Failure Patterns of Model Chisels Furrowers**  
- Presenting author: Eli Mamman, University, Maiduguri, Borno, Nigeria (Eli Mamman) 1900392

11:45am  **Determinants of Farmers’ Willingness to Invest in Agricultural Machinery Cooperatives**  
- Presenting author: Lijun Xu, Zhejiang A&F University, Hangzhou, Zhejiang China (Yang Zidong) 1900441

12:00pm  **Experiment Research on Mechanical Properties of Soybean Stalk**  
- Presenting author: Teng Yuejiang, I, Zibo, Shandong China (Yuejiang Teng, Chengqian Jin, Xiang Yin, Hongru Xie, Yanpu Chen, Feiyang Guo, Peng Liu) 1900707

**208 Crop and Soil Sensing**

Tuesday, July 9, 9:30am-12:00pm
Location: Brandeis
Sponsored by: MS-54; MS-45
Moderator: Lav Khot, Washington State University, Prosser, WA

9:35am  **Development of a Vehicular Soil EC Measuring System**  
- Presenting author: Hongyi Wei, China Agricultural University, Beijing, China (Hongyi Wei, Fanjia Meng, Xiu Wang, Wei Ma, Wei Sun) 1901581

9:50am  **Development of Measurement System for Crop SPAD Index and Soil-Organic-Matter Based on the Color Sensor**  
- Presenting author: Jiangtao Qi, Jilin University, Changchun, Jilin, China (Jiangtao Qi, Viacheslav Adamchuk, Huibin Sun, Marie-Christine Marmette, Md Saifuzzaman, Hongli Tian, Eko Leksono, Jaesung Park) 1901031

10:05am  **Proximal Sensing of Crop Surface Albedo with Multispectral Imaging Sensors On Board Ground-Based Platform**  
- Presenting author: Fidel Maureira, Washington State University, Pullman, WA (Fidel Maureira, Abhilash Chandel, Behnaz Molaei, Lav Khot, Troy Peters, Claudio Stockle) 1901685

10:20am  **Initial Results of Using Canopy Reflectance and Distributed Sensor Stations to Monitor Crop Damaging Events**  
- Presenting author: Dalyn McCauley, University of Idaho, Moscow, ID (Jason Kelley) 1901805

10:35am  **BREAK**

10:45am  **Using SPOT 7 Satellite Imagery For Nitrogen Fertilizer Management In Oil Palm Plantations**  
- Presenting author: Abdul Rashid Mohamed Shariff, Universiti Putra Malaysia, Serdang, Selangor, Malaysia (Mohamad Yadegari, Abdul Rashid Mohamed Shariff, Siti Khairunniza Bejo) 1901583

11:00am  **Using Soil Moisture Sensors to Understand In-Field Soil Moisture Variability**  
- Presenting author: Mary Love Tagert, Mississippi State University, Mississippi State, MS (Mary Love Tagert, Blade Hodges, Joel Paz, Dennis Reginelli) 1901508

**NO-SHOW**  **Assessing the Canopy Temperature of Tomato Plants under Deficit Irrigation through Infrared Thermal Imaging**  
- Presenting author: Ikram Ullah, Jiangsu University, Zhenjiang, Jiangsu China (Ikram Ullah, Mao Hanping, Ning Yang, Wei Yazhou, Fiaz Ahmad Azeem, Noman Ali Buttar) 1901619

11:30am  **Use of Thermal Imagery to Identify Stress in Crops Grown in Various Environments and Soil Types**  
- Presenting author: Ajay Sharda, Kansas State University, Manhattan, KS (Harman Singh Sangha, Ajay Sharda, William Schpaugh, Deon van der Merwe) 1901809

**NO-SHOW**  **Measurement and Analysis the Influence Factors of Soil-Wire Interface 3D Contact Area on Soil-Bin**  
- Presenting author: Chunxia Jiang, Anhui Science and Technology University, Chuzhou, Anhui China (Chunxia Jiang, Zhixiong Lu, Shrin K. Upadhaya, Feng Chen) 1900489

12:00pm  **Off-Highway Vehicle Testing Facility at Iowa State: Soil-Machine Dynamics Laboratory**  
- Presenting author: Brian L Steward, Iowa State University, Ames, Iowa (Mehari Z. Tekeste, Brian L. Steward, Stuart J. Birrell) 1901758

12:15pm  **Impact of Planter Closing Wheels on Corn Emergence in No-Till Cropping Systems**  
- Presenting author: Jessica Drewry, University of Wisconsin-Madison, Madison, WI (Brian Luck) 1901427

12:30pm  **The Influence of Rice Husk Incorporated into Sandy Loam Soil before Tractor Traffic on Growth and Yield of Sorghum in Northeastern Nigeria**  
- Presenting author: John Ohu, Maiduguri, Borno State, Nigeria (Eli Mamman, Yohanna Dzivama) 1901501

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209 Pesticide and Fertilizer Application Technology, Formulation, and Environmental Effects
Tuesday, July 9, 9:30am-12:00pm
Location: Northeastern
Sponsored by: MS-23/6; MS-54
Moderator: Adam Barlow, John Deere Des Moines Works, Ankeny, IA


9:50am Design and Performance Experiment of Fertigation Equipment Using Solid Fertilizer • Presenting author: Zhiyang Zhang, Jiangsu University, Zhenjiang, Jiangsu, China (Zhiyang Zhang, Hong Li, Chao Chen, Huameng Xia) 1901003

10:05am Test Methods Not Yet Covered by EN ISO 16122—Micro Granular Applicators and Slug Pellet Applicators • Presenting author: Keith Hawken, Peterborough, United Kingdom (Keith Hawken) 1900530

10:20am Evaluating Various Methods for Developing Management Zones and How They Relate to Soil Fertility Levels • Presenting author: Alexander Coleman, Clemson University, Blackville, SC (Alexander Coleman, Kendall Kirk, Michael Plumblee) 1901174

10:35am BREAK

10:45am Droplet Impact and Adhesion as Related to Quantified Industry Surface Roughness Parameters • Presenting author: JohnPaul R. Abbott, ARS-USDA-ATRU, Wooster, OH (Heping Zhu) 1900217

11:00am Design and Experiment of Pneumatic Conveying Seeder with No-Tillage for Simultaneous Seeding of Wheat Seed and Fertilizer • Presenting author: Duanyang Geng, Shandong University of Technology, Zibo, Shandong China (Xingrui Yu, Duanyang Geng, Qian Wang, Yangcheng Liu, Delei Tan, Guoliang Su, He Ke) 1900753


11:30am Integration of Premixing In-Line Injection System into Variable-Rate Orchard Spraying Systems • Presenting author: Zhihong Zhang, USDA-ARS, Wooster, OH (Zhihong Zhang, Heping Zhu, Chengsong Hu) 1900345

11:45am Measurement of Granular Fertilizer Particles Using Image Processing for Spread Distribution Evaluation • Presenting author: John Fulton, Ohio State University, Columbus, OH (Max Dignan, Richard Colley III, Elizabeth Hawkins, Scott Shearer) 1901828

12:00pm Solid Set Canopy Delivery Spray Systems for High-Density Fruit Production: Comparison of Off-Target Deposition Using Various Strategies Over 2 Field Seasons • Presenting author: Mark Ledebuhr, Application Insight, LLC, Lansing, MI (Matthew Grieshop, Mark Ledebuhr, Keith Koontzer) 1901172

12:15pm Graphene as a New Way to Accelerate Plant Growth • Presenting author: Sunho Park, Chonnam National University, Gwangju, Republic of Korea (Sunho Park, Daun Kim, Sujin Kim, Yonghyun Gwon, Jangho Kim) 1901077

251 Soil-Plant-Machine Dynamics and Systems Simulation
Tuesday, July 9, 9:30am-12:00pm
Location: Tufts
Sponsored by: MS
Moderator: Paula Misiewics, Harper Adams University, Newport, Shropshire United Kingdom


9:50am Yield Impacts of Large Central Fill Planters and Tractors on Pinch Rows • Presenting author: Andrew Klopfenstein, The Ohio State University, Columbus, OH (Andrew Klopfenstein, Richard Colley III, Ryan Tietje, Chris Wiegman, John Fulton, Scott Shearer) 1901181

10:05am Variability in Tractive Performance Data of Agricultural Tractor Drive Tires • Presenting author: Thomas Way, USDA-ARS, Auburn, AL (Tadashi Kishimoto, Mehari Tekeste) 1901664

10:20am Calibration of the Draft Force Model for Multiple Tool Tillage Implements • Presenting author: Andrew Klopfenstein, The Ohio State University, Columbus, OH (Andrew Klopfenstein, Scott Shearer) 1901137

10:35am BREAK

10:45am Development of Tractor Bicycle Model with Ride Vibration • Presenting author: Masahisa Watanabe, Tokyo University of Agriculture and Technology, Fuchu, Tokyo, Japan (Kenshi Sakai) 1900264

11:00am Design and Experiment of Rotary Nail Tooth Type Residual Plastic Mulch Recycling Machine • Presenting author: Wensong Guo, China Agricultural University, Beijing, China (Wensong Guo, Xufeng Wang, Bing Lu, Can Hu, Panfeng Zhang, Shulin Hou) 1900126

11:15am Techno-Economic Performance of Conservation Agriculture Machinery for Planting Soybean in the Coastal Region of Bangladesh • Presenting author: Md Monjurul Alam, Bangladesh Agricultural University, Mymensingh, Bangladesh (M A Mottalib, M A Hossain, M I Hossain, M N Amin, M M Alam) 1900574

Tuesday, July 9

210 Advances in Applying and Evaluating Hydrologic and Water Quality Models
Tuesday, July 9, 9:30am-12:00pm
Location: Tremont
Sponsored by: NRES-21
Moderators: Derek Schlea, Limno Tech, Britton, MI; Ritesh Karki, Auburn University, Auburn, AL

9:35am Modeling the Effect of Crop Rotation and Tillage Operations on Sugarbeet Production Using Root Zone Water Quality Model (RZWQM2) • Presenting author: Mohammad Anar, University of Minnesota, Lamberton, MN (Mohammad Anar) 1900579

9:50am Mathematical Modeling of Deep-Bed Biofiltration to Describe Contaminant Control and Headloss Development • Presenting author: Yewei Sun, Virginia Tech, Manassas, VA (Ramola Vaidya, Wendell Khunjar, Erik Rosenfeldt, Merc Selbes, Christopher Wilson, Charles B. Boll, Zhi-Wu Wang) 1900236

10:05am Modeling the Capacity of Wetting and Drying Cycles to Enhance Denitrification in Woodchip Bioreactors • Presenting author: Francois Birgand, NC State University, Raleigh, NC (S. Tian, B. M. Lafayette, IN (Bernard A. Engel, Dennis C. Flanagan) 1900777

10:20am Assessment of USGS DEMs for Modeling Pothole Indundation in the Prairie Pothole Region of Iowa • Presenting author: Pawan Upadhyay, Iowa State University, Ames, IA (Pawan Upadhyay) 1900226

10:35am BREAK

10:45am Evaluation of the Water Erosion Prediction Project (WEPP) Model for Quantifying Subsurface Drainage Flow • Presenting author: Josep Revuelta, Purdue University, West Lafayette, IN (Bernard A. Engel, Dennis C. Flanagan) 1900777

10:50am Glyphosate in Freshwater Water System • Presenting author: Premod Pandey, UC Davis, Davis, CA (Premod Pandey, Jeffrey Caudill, Sarah Lesmeister, Yewei Sun, Virginia Tech, Manassas, VA (Ramola Vaidya, Wendell Khunjar, Erik Rosenfeldt, Merc Selbes, Christopher Wilson, Charles B. Boll, Zhi-Wu Wang) 1900236

11:00am Ensuring that Good Model Performance Statistics Correspond to Sound Model Science: A Case Study in Minnesota • Presenting author: Anurag Mishra, DSI, LLC, Edmonds, WA (Paul B. Duda, Anthony S. Donigian, Paul Hummel, John Imhoff, Chuck Regan) 1900906

11:30am Relationships between Coefficients of Determination and Correlation, Bias, and Regression • Presenting author: Hubert Montas, University of Maryland, College Park, Maryland, College Park, MD (Hubert Montas, Adel Shirmohammadi, Masoud Negahban-Azar, Paul Leisnham) 1901305

11:45am Impact of Calibration Objective Function on the Performance of the Hydrological Model • Presenting author: Vamsikrishna Vema, Purdue University, West Lafayette, IN (Cicily Kurian, Athira P, K P Sudheer, Indrajeeet Chaubey) 1900184

12:00pm Some Considerations on the Modeling of Flow and Transport in Heterogeneous Environments • Presenting author: Hubert Montas, University of Maryland, College Park, MD (Hubert Montas, Adel Shirmohammadi) 1901376

211 Advances in Drainage Design, Monitoring, and Modeling
Tuesday, July 9, 9:30am-12:00pm
Location: Vineyard
Sponsored by: NRES-23
Moderators: Vinayak Shedekar, Ohio State University, Columbus, OH; Rohith An, IIT Madras, Chennai India

9:35am SWAT+: Simulating Drainage Water Management on a Field Scale • Presenting author: Abhinav Sharma, North Carolina State University, Raleigh, NC (Rachel McDaniel) 1900986

9:50am Effects of Sivicultural Drainage on Wetland Hydrology—Lessons from the Pine Woods • Presenting author: R. Wayne Skaggs, North Carolina State University, Raleigh, NC (Devendra Amaty, George (Chip) Chescheir) 1901819

10:05am Evaluation of Various Nutrient Loss Reduction Strategies Using DRAINMOD-DSSAT from Fields with Tile Drainage System • Presenting author: Shailendra Singh, University of Illinois, Urbana, IL (Rabin Bhattarai, Lamyaa Negm, Mohamed Youssef) 1901162

10:20am Drainage Hydrology of an Intensively Cropped Peat Soil • Presenting author: Chandra Madramootoo, McGill University, Ste. Anne de Bellevue, Quebec Canada (Chandra A. Madramootoo) 1901861

10:35am BREAK

10:45am Nitrogen Balance as an Environmental Performance Indicator for Drained Cropland in Iowa • Presenting author: Christopher Hay, Iowa Soybean Association, Ankeny, IA (Peter Kyvergya, Adam Kiel, Anthony Seeman) 1901305

11:00am Assess Effectiveness of Salt Removal by a Subsurface Drainage with Bundled Crop Straws in Coastal Saline Soil Using HYDRUS-3D • Presenting author: Peirong Lu; Zhaoyu Zhang; Hohai University, Nanjing, Jiangsu, China (Peirong Lu, Zhaoyu Zhang, Zhuoping Sheng, Mingyi Huang) 1900840

11:15am Assessing the Effects of Subsurface Drainage on Downstream Flooding in an Agricultural Dominated Watershed • Presenting author: Vaishali Sharda, Kansas State University, Manhattan, KS (Vaishali Sharda, Laurent Ahiablame, Esther Mosase, Daniel Moriasi) 1901452

11:30am Analyzing Winter Cover Crop Impacts on Soil Nitrogen Dynamics Using DSSAT Model • Presenting author: Rishabh Gupta, University of Illinois at Urbana-Champaign, IL (Rabin Bhattarai, Richard T. Roth, Shalamar D. Armstrong) 1901392

11:45am Towards Improving the DNDC model for Simulating Soil Hydrology and Tile Drainage • Presenting author: Ward Smith, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada (Ward Smith, Zhiming Qi, Brian Grant, Wentian He, Andrew VanderZaag, Craig F. Drury, Chin S. Tan, Matthew Helmers) 1901842

NO-SHOW Simulated Hydrological Response and Agricultural Productivity to Tile Spacing and Depth at the Field and Watershed Scales • Presenting author: Hanseoek Jeong, University of Illinois, Urbana, IL (Shailendra Singh, Younggu Her, Rabin Bhattarai) 1901266

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Tuesday, July 9

12:15pm  DRAINMOD Simulation of Macropore Flow: Model Modification and Field Testing  • Presenting author: Manal Askar, NC State University, Raleigh, NC (Manal H. Askar, Mohamed A. Youssef, George M. Chescheir, Lamyaa M. Negm, Kevin W. King, R. Wayne Skaggs, Ehsan Ghane) 1900692

212 Anaerobic Digestion
Tuesday, July 9, 9:30am-12:00pm
Location: Clarendon
Sponsored by: NRES-27; PRS-707
Moderators: Doug Hamilton, Oklahoma State University, Stillwater, OK; Mahmoud Shehata, North Carolina State University, Raleigh, NC

9:35am  Impact of Process Parameters on Methane and Biogas Yield in Solid-State Anaerobic Co-Digestion: A Review  • Presenting author: Anthony Amori, University of Nebraska-Lincoln, Lincoln, NE (Ademola Ajayi-Banji, Olayinka Omotosho) 1900721

9:50am  Bio-Methane Potential Testing Methodologies—A Review  • Presenting author: Sarah Daly, Purdue University, West Lafayette, IN (Ji-Qin Ni) 1900875

10:05am  Effect of NaOH-Pretreated-Cornstover and Dairy Manure on Biogas Production in Solid-State Anaerobic Co-Digestion  • Presenting author: Ademola Ajayi-Banji, Agricultural & Biosystems Engineering Department in North Dakota State University, Fargo, ND (Shafiqur Rahman) 1900622

10:20am  Effects of Biochar and Activated Carbon on Anaerobic Digestion of a Nitrogen-Rich Organic Waste—Swine Manure  • Presenting author: Wei Liao, Michigan State University, East Lansing, MI (Meicai Xu, Sibel Uludag-Demirer, Adam Smerigan, Di Fang, Liang Zhou, Yan (Susie) Liu, Wei Liao) 1901635

10:35am  BREAK

10:45am  Process Intensification of Anaerobic Digestion through Temperature Phased Anaerobic Digestion and Thermal Hydrolysis Pretreatment  • Presenting author: Dian Zhang, Virginia Tech, Manassas, VA (Tom Broderick, Mary Strawn, Hari Santha, Zhi-Wu Wang) 1900234

11:00am  Food Waste Co-Digestion in Germany and the United States: From Lab to Full-Scale Systems and Associated Policy Implications and Barriers  • Presenting author: Stephanie Lansing, University of Maryland, College Park, MD (Benedikt Hülsemann, Abhinav Choudhury, Jenna Schueler, Maria Sol Lisboa, Carlton Poindexter, Hans Oechsner) 1901632

11:15am  Economic Analysis of Producing Solid and Liquid Biofertilizers from Anaerobic Digestates  • Presenting author: Tyler Barzee, University of California Davis, Davis, CA (Abdelhossein Edalati, Hamed El-Mashad, Ruihong Zhang) 1900595

11:30am  Characteristics and Biomethane Potentials of Field Residues of Fruits and Vegetables  • Presenting author: Chang Chen, Beijing University of Chemical Technology, Beijing, China (Chang Chen, Fanfan Cai, Guangqing Liu, Ruihong Zhang) 1901571

11:45am  Effect of Metal Nanoparticles on Anaerobic Digestion  • Presenting author: Amro Hassanein, Department of Environmental Science and Technology, University of Maryland, College Park, MD (Amro Hassanein, Stephanie Lansing, Rohan Tikekar) 1901659

12:00pm  Anaerobic Treatment of Hydrothermal Aqueous Product for Enhanced Energy Recovery from Wet Biomass  • Presenting author: Ana Martin-Ryals, University of Florida, Gainesville, FL (Ana Martin-Ryals, Lance Schideman) 1901382

12:15pm  Coupling Anaerobic Digestion and Vermicomposting to Extract Bioenergy and Nutrients from Food- and Yard-Waste  • Presenting author: Pius Ndegwa, Washington State University, Pullman, WA (Sifolo Coulibaly, Yiqing Yao) 1901640

213 BMPs and Water Quality: Modeling
Tuesday, July 9, 9:30am-12:00pm
Location: Berkeley
Sponsored by: NRES-22; NRES-21; NRES-225; NRES-23; NRES-25; NRES-26; NRES-28
Moderators: Paula Steiner, USDA NRCS, Lansing, MI; Kira Hansen, University of Florida, Immokalee, FL

9:35am  Quantification and Simulation of Nutrient Sources at Watershed Scale in Mississippi  • Presenting author: Avay Risal, Department of Agricultural and Biological Engineering, Mississippi State University, Mississippi State, MS (Prem B. Parajuli) 1900105


10:05am  Shifting Demographics: Modeling the Impact of Future Changes in the Farming Community within the Maumee River Watershed  • Presenting author: Jeffrey Kast, The Ohio State University, Columbus, OH (Jeffrey Kast, Jay Martin, Margaret Kalcic, Robyn Wilson, Doug Jackson-Smith, Anna Apostel, Grey Evenson) 1900110

10:20am  Modeling the Effects of Land Use and Agricultural Management on Nutrient Loss, Atrazine and E. coli Concentrations in a Watershed Using SWAT  • Presenting author: Olufemi Abimbola, University of Nebraska-Lincoln, Lincoln, NE (Olufemi Abimbola, Aaron Mittelstet, Tiffany Messer, Elaine Berry) 1901350

10:35am  BREAK

10:45am  Comparison of Structural and Non-Structural Field Level Best Management Practices on Kettle Creek Paired Watershed, Canada  • Presenting author: Narayan Shrestha, University of Guelph, Guelph, Ontario Canada (Narayan Kumar Shrestha, Prasad Daggupati, Ramesh P. Rudra, Rituraj Shukla) 1900603

11:00am  Assessment of Riparian Buffers’ Effectiveness in Controlling Nutrient and Sediment Loads as a Function of Buffer Design, Site Characteristics and Upland Loadings  • Presenting author: Fei Jiang, Pennsylvania State University, State College, PA (Fei Jiang, Heather Gall, Tamie Veith, Raj Cibin, Patrick Drohan) 1901516

11:15am  Impact of Field-Scale Best Management Practices on Jeannette Creek Watershed, Ontario Canada  • Presenting author: Ramesh P. Rudra, University of Guelph, Guelph, Ontario Canada (Rituraj Shukla, Ramesh P. Rudra, Prasad Daggupati, Pradeep K. Goel, Narayan Kumar Shrestha) 1901836
**Tuesday, July 9**

**11:30am** Optimizing Management Approaches to Reduce Nutrient and Sediment Runoff from Dairy Farms in Central Pennsylvania  
- Presenting author: Ryan Barnes, Penn State, University Park, PA (Ryan Barnes, Heather E. Gall, C. Alan. Rotz, Tamie L. Veith, Herschel A. Elliott, John T. Tyson, John E. Watson) 1901552

**11:45am** Preferential Flow in Vegetative Filter Strips and Riparian Buffers: Experimentation and Numerical Modeling  
- Presenting author: Lucie Guertault, NC State University, State College, PA (Cibin Raj, Jeffrey Arnold, Dan Jaynes Dan, Philip Gassman, Thomas Isenhart Thomas) 1901802

**214 Erosion Control Research and Case Studies**
- Tuesday, July 9, 9:30am-12:00pm
- Location: Arlington
- Sponsored by: NRES-22; NRES-223
- Moderators: Dennis Flanagan, USDA ARS NSERL, West Lafayette, IN; Carolyn Jones, USDA NRCS, Vacaville, CA

**9:35am** Estimating Sediment Transport Capacity for Overland Flow  
- Presenting author: Shuyuan Wang, Purdue University, West Lafayette, IN (Shuyuan Wang, Dennis Flanagan, Bernard Engel) 1900251

**9:50am** Hydrologic and Erosion Impacts of Weather and Management Conditions in the US Northwest Wheat and Range Region: WEPP Simulation  
- Presenting author: Joan Wu, Washington State University, Puyallup, WA (Joan Q. Wu, M. Samrat Dahal) 1901309

**10:05am** WEPP and RUSLE2 Erosion Prediction Comparisons  

**10:20am** Analysis of a Market Assessment Survey to Help Promote Lake Restoration of Lake Bosumtwe and Increased Livelihoods for Smaller-Holder Farmers  
- Presenting author: Robert M. Stwalley III., Purdue University Agricultural & Biological Engineering, West Lafayette, IN (Grace Baldwin, Robert M. Stwalley III) 1901379

**10:35am** BREAK

**10:45am** North American Project to Evaluate Soil Health Measurements  
- Presenting author: Elizabeth Rieke, Soil Health Institute, Morrisville, NC (Elizabeth Rieke, Paul Tracy, Cristine Morgan, Wayne Honeycutt) 1901701

**11:00am** Critical Conservation Practices Identified by CEAP Modeling for Sustainable Watershed Management  
- Presenting author: Xiuying Wang, Blackland Research and Extension Center, Temple, TX (Xiuying Wang, Kate Behrman, Mari-Vaughn Johnson, Lee Norfleet) 1901893

**11:15am** Evaluation of Various Products for Sediment Perimeter Barrier  
- Presenting author: Jacob Wood, University of Illinois, Urbana-Champaign, IL (Rabin Bhattachiri) 1901282

**11:30am** Prediction of Soil Erosion of Imo State Soils by Their Infiltration Rates  
- Presenting author: Gregory Obiechefu, Imo State Polytechnic, Umuaggu, Imo Nigeria (Gregory Obiechefu, Kodak Emerson, Precious Egbiukwe) 1900428

**11:45am** The Susceptibility of Two Agricultural Soils Incorporated with Inorganic Fertilizer to Splash under Simulated Rainfall  
- Presenting author: John Ohu, Maiduguri, Borno State, Nigeria (Eli Mamman) 1901460

**NO-SHOW** Assessment of Erosion Problems: Case Study of Auchi, Edo State in Nigeria  

**215 Innovative Water Quality and Hydrologic Monitoring and Analysis**
- Tuesday, July 9, 9:30am-12:00pm
- Location: Provincetown
- Sponsored by: NRES-21; NRES-28
- Moderators: Debabrata Sahoo, Woolpert Inc., West Columbia, SC; Brock Kamrath, North Carolina State University, Raleigh, NC

**9:50am** Classifying Origin of crude oil Using Raspberry Pi and Paper Microfluidic Chip  
- Presenting author: Soo Chung, Department of Biosystems Engineering, Tucson, AZ (Soo Chung, Christian Jennings, Sean Perea, Un Hyuk Yim, Jeong-Heol Yoon) 1901512

**10:05am** Pesticide Exposure in Recreational Lakes  
- Presenting author: Tiffany Messer, University of Nebraska-Lincoln, Lincoln, NE (Mary Keilhauer, Tiffany L. Messer, Dan Snow, Aaron Mittelstet) 1900181

**10:20am** Quantifying Transport and Fate Dynamics of Sediment Nitrogen in a Backwater Wetland Using High Resolution Sensing  
- Presenting author: Ciara Pickering, University of Kentucky, Lexington, KY (William Ford) 1900567

**10:35am** BREAK

**10:45am** Fuzzy-Logic Based Approach for E. coli Load Prediction in Cascading Dams  
- Presenting author: Olufemi Abimbola, University of Nebraska-Lincoln, Lincoln, NE (Olufemi Abimbola, Aaron Mittelstet, Tiffany Messer, Elaine Berry) 1901351

**11:00am** A Meta-Analysis of Water Quality Studies in the Ochlockonee River Basin  
- Presenting author: Mikela R. Pryor, Florida A&M University, Tallahassee, FL (Aavudai Anandhi, Anjali Sharma) 1901719

**NO-SHOW** Temporal Stability of Fecal Indicator Bacteria in a PA Creek Using Empirical Orthogonal Functions  
- Presenting author: NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Tuesday, July 9

Eunmi Hong, Kangwon National University, Gangwon, Korea (Yakov Pachepsky, Cary Copcock) 1901591

11:30am Monitoring Hydrogeological Changes at a Newly Commissioned Intensive Cattle Feeding Operation • Presenting author: Crystal Rinas, University of Saskatchewan, Saskatoon, Saskatchewan, Canada (Terrance Fonstad) 1901413

11:45am How Frequent Is Enough? Water Quality Data Cases • Presenting author: Niraj Aryal, NC A&T State University, Greensboro, NC (Michele Reba) 1900554

216 Nutrient Removal, Recovery and Recycle Tuesday, July 9, 9:30am-12:00pm Location: Nantucket Sponsored by: NRES-28 Moderators: Lordwin Jeyakumar, Agriculture & Agri-Food Canada, Allahabad, Uttar Pradesh India; Faezeh Eslamian, McGill University, Montreal, Quebec Canada

9:35am Free Ammonia Inhibition as a Means of Suppressing Nitrite Oxidizing Bacteria in Differently Sized Granules Treating Agricultural Wastewater • Presenting author: Zhi-Wu Wang, Virginia Tech, Manassas, VA (Yewei Sun, Zhaohui An, Charles B. Bott, Zhi-Wu Wang) 1900449

9:50am Novel Adsorbents for the Removal and Recovery of Soluble Reactive Phosphorus • Presenting author: Kevin Kelly, McGill University, Sainte Anne de Bellevue, Quebec, Canada (Kevin Kelly, Zhiming Qi) 1901478

10:05am Reverse Osmosis Treating Cured Meat Processing Wastewater for Removal of Inorganic Nutrients and Salt • Presenting author: Kelsey Henderson, The Ohio State University, Columbus, OH (Karen Mancil) 1900350

10:20am Feasibility Analysis of Phosphorus Recovery from Corn Dry Grind Industry • Presenting author: Ankita Juneja, University of Illinois, Urbana, IL (Ankita Juneja, Roland Cusick, Vijay Singh) 1900923

10:35am BREAK

10:45am Life Cycle Assessment of Land-Applied Wastewater Biosolids in Canada • Presenting author: Elissa Saliba, McGill University, Montreal, Quebec, Canada (O. Grant Clark, Michael Y. Boh) 1901212

11:00am Pilot-Scale Evaluation of the Effects of Settling Velocity-Based Selection and Feast/Famine Conditions on Continuous Flow Aerobic Granulation • Presenting author: Yewei Sun, Virginia Tech, Manassas, VA (Bob Angelotti, Matt Brooks, Zhi-Wu Wang) 1900237

11:15am Fertilizer Value of Human Excreta: An Estimate for Canada • Presenting author: Michael Boh, McGill University, Ste-Anne-de-Bellevue, Quebec Canada (Michael Y. Boh, Osborne G. Clark) 1901483

11:30am Nitrogen and Phosphorus Flows in Ontario’s Food Systems • Presenting author: Michael Boh, McGill University, Ste-Anne-de-Bellevue, Quebec Canada (Michael Y. Boh, Osborne G. Clark) 1901481

11:45am Closing the Loop on Wastewater Treatment and Sustainable Agriculture: Nutrient Recovery and Reuse Opportunities with Duckweed • Presenting author: Rachel Brennan, Penn State University, University Park, PA (Benjamin Roman) 1901717

12:00pm Green Fertilizer Production from Air and Water by a Novel Electrical Discharge Process • Presenting author: Bishal Thapa (Sarah Wu, Bishal Thapa) 1901582

12:15pm Multimodal Algal Bacterial Bioprocess for Treatment of Municipal Wastewaters • Presenting author: Ganti S Murthy, Oregon State University, Corvallis, OR (Durga Madhab Mahapatra, Ganti S Murthy) 1900981

217 Sustainable Irrigation Management Tuesday, July 9, 9:30am-12:00pm Location: Orleans Sponsored by: NRES-24; NRES-244 Moderators: Vivek Sharma, University of Wyoming, Powell, WY; Sushil Himanshu, Texas A&M AgriLife Research, Vernon, TX

9:35am Plant Density, an Important Factor in Advancing Irrigation Management of Maize • Presenting author: Freddie Lamm, Kansas State University, Colby, KS (Freddie Lamm) 1901166

NO-SHOW Crop Evapotranspiration, Irrigation Water Requirements and Water Productivity of Maize from Meteorological Data under Semi-arid Climate • Presenting author: Koffi Djaman, New Mexico State University, Farmington, NM (Kevi Lombard, Suat Irmak) 1900112

10:05am Effect of Deficit Irrigation on Dry Bean Soil Moisture Dynamics, Evapotranspiration, Yield and Water Use Efficiency in Inter-Mountain Region of Wyoming • Presenting author: Vivek Sharma, University of Wyoming, Powell, WY (Vivek Sharma) 1901203

10:20am Evaluation of Deficit Irrigation Scheduling Strategies for Cotton to Cope with Declining Water Availability in the Southern High Plains • Presenting author: Sushil Kumar Himanshu, Texas A&M Agrilife Research, Vernon, TX (Sushil Kumar Himanshu, Srinivasulu Ale, James Bordovsky, Murali Darapuneni) 1900798

10:35am BREAK

10:45am Irrigation Advisory Service: A Comprehensive Solution Toward Sustainable Water Management for Rice Production in the Philippines • Presenting author: Manuel Jose C. Regalado Philippine Rice Research Institute (PhilRice), Munoz Science City, Nueva Ecija, Philippines (Manuel Jose C. Regalado, Sudhir Yadav, Kristine Samoy-Pascual, Jovino L. De Dios, Gio Karlo Evangelista, Marvelin L. Rafael, Derek D. Dorado, Romeo J. Cabangon) 1900677

11:00am Economic Analysis of Deficit Irrigation in Sugarcane Farming: Nhcalo Estate, Chikwawa District, Malawi • Presenting author: Derek M. Heeren, University of Nebraska-Lincoln, Lincoln, NE (Mavuto M. Banda, Derek M. Heeren, Derrel L. Martin, Francisco Munoz-Arriola, László G. Hayde) 1900852

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
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<td>11:15am</td>
<td>Impact of Variable and Fixed Rate Irrigation and Fertigation Strategies on Maize Grain Yield, Evapotranspiration and Water Use Efficiency</td>
<td>Vasudha Sharma, University of Minnesota, Saint Paul, MN; Tiago Costa, University of Illinois, Urbana-Champaign, IL</td>
<td>Salon J</td>
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<td>11:30am</td>
<td>Integrated Soil Moisture and Canopy Temperature Sensing System for Irrigation Scheduling</td>
<td>Sandeep Bhatti, University of Nebraska Lincoln, Lincoln, NE; Arti Kumari, Virginia Tech, Blacksburg, VA</td>
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<td>9:30am</td>
<td>Vulnerability of Land Resources for Sustainable Development—Accomplishment in the Past 3 Years</td>
<td>Aavudai Anandhi, Biological Systems Engineering Program, Florida A&amp;M University, Tallahassee, FL</td>
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<td>9:45am</td>
<td>Sustainable Development in the Context of Irrigation</td>
<td>Kati Migliaccio, Department of Agricultural and Biological Engineering, University of Florida, Gainesville, FL</td>
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<td>10:05am</td>
<td>Land Use Change and Vulnerability Assessment for Sustainable Development</td>
<td>Gang Chen, Department of Civil Engineering, Florida A&amp;M University, Tallahassee, FL</td>
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<td>11:15am</td>
<td>Tales from Texas—Vulnerability of Land Resources for Sustainable Development</td>
<td>Venki Uddameri, Department of Civil, Environmental, and Construction Engineering, Lubbock, TX</td>
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<td>11:50am</td>
<td>Natural Resource and Forest Land Management / Research Role in Developing Sustainable Agroecosystem</td>
<td>Johnny Grace, USDA-Forest Service, Tallahassee, FL</td>
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<td>10:05am</td>
<td>Factors Affecting Pre-Filter Loading and Strategies to Manage Excessive Loading</td>
<td>Benjamin Smith, Iowa State University, Ames, IA; Daniel Andersen, Jeffery Zimmerman, John Stinn</td>
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<td>10:20am</td>
<td>Simulating Risk Reduction Using Biosecurity Practices on Farm</td>
<td>Erin Cortus, University of Minnesota, St Paul, MN; Abby Neu, Kevin Janni, Sally Noll, Chuck Clanton</td>
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<td>10:35am</td>
<td>Break</td>
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<td>10:45am</td>
<td>Monitoring the Dust Level of the Broiler Breeder Houses in Georgia USA</td>
<td>Lilong Chai, University of Georgia, Athens, GA; Claudia Dunkley, Casey Ritz</td>
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<td>11:00am</td>
<td>Session Wrap Up: Engineered Approaches to Biosecurity—Opportunities for Designed Interventions</td>
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<td>220 Greenhouse and Nursery Technology</td>
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<td>9:35am</td>
<td>Humidity Recovery and Reuse Using Liquid Desiccants for Sustainable Water Use in Controlled Environment Agriculture</td>
<td>Ryan Lefers, King Abdullah University of Science and Technology, Thuwal, Makka, Saudi Arabia; Omar Hijazi, Essam Abdelsalam, Jochen G. Wiecha, Kathrin L. M. Ziegler, Heinz Bernhardt</td>
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<td>10:05am</td>
<td>The Canadian Integrated Northern Greenhouse: Four-Season Testing and Future Opportunities</td>
<td>David Leroux, McGill University, Sainte-Anne-de-Bellevue, Quebec, Canada; David Leroux, Mark Lefsrud</td>
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<td>10:20am</td>
<td>The Use of Light Emitting Diodes for Shelf Life Extension of Spinach and Kale</td>
<td>Anne Sophie Rufyikiri, McGill University, Montreal, Quebec Canada; Mark Lefsrud, Bo-Sen Wu</td>
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<td>10:35am</td>
<td>Break</td>
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<td>10:45am</td>
<td>Design of a Bioreactor and Nutrient Monitoring Instrument for Food Production in Hydroponic Systems Located in Northern Canada</td>
<td>Peter Tikasz, McGill University, Montreal, Quebec Canada; David Leroux, Mark Lefsrud</td>
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**Tuesday, July 9**

**NO RECORDING** of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED. 61
Tuesday, July 9

11:00am  **Influence of Biochar Amendment on the Efficacy of Algal Biofertilizers to Support Plant Growth**  •  Presenting author: Steven White, Oregon State University, Corvallis, OR (Durga Madhab Mahapatra, Steven White, Ganti S Murthy) 1900979

11:15am  **Deep Neural Network Based Control Algorithm for Maintaining Electrical Conductivity and Water Content of Substrate in Closed-Soiless Cultivation**  •  Presenting author: Daehyun Jung, KIST/Seoul National University, Gangleung, Gangwon South Korea (Daehyun Jung, Soo Hyun Park, Hak Jin Kim, Taek Sung Lee, Jung Suk Yang, Changho Jin) 1900951

11:30am  **Improved Procedure for Germination of Coix lacrima-jobi (Poaceae) and Rhynchospora corymbosa (Cyperaceae) Seeds in the Environmental Chamber and Greenhouse**  •  Presenting author: Oluseyi E. Ewemoje, University of Ibadan, Ibadan. Oyo State, Nigeria (Abimbola Sangodoyin, Adeniyi Jayeola, Tyler S. Radniecki) 1900362

11:45am  **Design and Experiment on the Tray Embedding Machine for Hybrid Rice Potted Seedlings**  •  Presenting author: Ruiyun Zhou, Zhejiang University, Hangzhou China (Kun Ding, Xiaojiang Du, Yaxin Yu, Jianneng Chen, Ruiyun Zhou) 1900402

12:00pm  **Chassis Design and Finite Element Analysis of Plug Seeding Automatic Transplanter**  •  Presenting author: Jing Zhang, Jiangsu University, Zhenjiang, Jiangsu, China (Qizhi Yang, Guanlong Huang, Xinyi Shi, Guangyu Du, Jing Zhang, Jianping Hu, M. Addy) 1901563

12:15pm  **Design and Experiment of Automatic Seeder for Pteris vittata L.**  •  Presenting author: Junyang Chen, Zhejiang University, Hangzhou, Zhejiang, China (Junyang Chen, Jianping Li, Kang Wu, Songming Zhu) 1900342

12:30pm  **Design and Experiment of Transplanter for Watermelon Seeding Tray**  •  Presenting author: Chen Xiao, NRIAM, Nanjing, Jiangsu China (Xiao Chen, Yan Gong, Youyi Miao, Dejiang Liu, Xiao Zhang, Guo Wang) 1901518

**PRS Community Update**

Tuesday, July 9, 8:00am-9:00am
Salon I

221 Building Successful Collaborations to Address Challenges in Food and Bioprocess Engineering —PANEL

Tuesday, July 9, 9:00am-11:00am
Location: Salon I
Sponsored by: PRS-06
Moderator: Deepak Keshwani, University of Nebraska, Lincoln, NE

**222 Microwave and Radio-Frequency Energy for Processing**

Tuesday, July 9, 9:30am-12:00pm
Location: Columbus I
Sponsored by: PRS-703; PRS-703
Moderator: Satyanarayan Dev, Florida A&M University, Tallahassee, FL

9:35am  **A Microwave Dielectric Method for Rapid and Nondestructive Determination of Moisture Content and Water Activity of Almonds**  •  Presenting author: Samir Trabelsi, USDA-ARS, Athens, GA (Samir Trabelsi) 1901908

9:50am  **Thermal and Dielectric Properties of Red Lentil and Kabuli Chickpea in Relation to Radio Frequency Heat Treatment**  •  Presenting author: Adedayo Oke, University of Saskatchewan, Saskatoon, Saskatchewan Canada (Oon-Doo Baik) 1900913

10:05am  **Developing Radio Frequency Sensor Based Models for Grain Measurement**  •  Presenting author: Ewumbua Monono, North Dakota State University, Fargo, ND (Ewumbua Monono, Harjot Sidhu, Xin Sun, Benjamin Braaten, Ryan Striker, Bingcan Chen, Allen Peckrul, Gurmukh Advani) 1900836

10:20am  **Impact of Energy Dissipation Rate of a 915 MHz Microwave on Drying and Milling Characteristics of Parboiled Rice**  •  Presenting author: Deandrae Smith, Department of Food Science, University of Arkansas, Fayetteville, AR (Deandrae Smith, Griffiths G. Atungulu) 1901514

10:35am  **Break**

10:45am  **Drying of Soybean and Corn Seeds Using Microwave**  •  Presenting author: Rute Quelvia de Faria, IFGoiano, Urutaí, GO, Brazil (Amanda Rithieli Pereira dos Santos, Edvaldo Aparecido Amaral da Silva, Yvan Gariepy, Vijaya Raghavan, Maria Márcia Pereira Sartori) 1900535

**NO-SHOW  Modeling Radio Frequency Disinfection and Control of Insects in Dried Apricot**  •  Presenting author: Zhi Huang, Northwest A&F University, Yangling, Shaanxi China (Shaojin Wang) 1900639

11:15am  **The Quality and Staphylococcus aureus ATCC 25923 Survival on In-Shell Walnuts as Influenced by Radio Frequency Treatment**  •  Presenting author: Lihui Zhang, Northwest A&F University, Yangling, Shaanxi China (Lihui Zhang, Shuang Zhanh, Rui Li, Shaojin Wang) 1900474

11:30am  **Microbial Validation of Continuous Radiofrequency Pasteurization of Cumin Seeds**  •  Presenting author: Long Chen, University of Nebraska-Lincoln, Lincoln, NE (Long Chen, Sibel Irmak, Jeyamkondan Subbiah) 1901331

11:45am  **Effects of Fissures of Germinated Brown Rice Caused by Microwave Drying on its Cooking Quality**  •  Presenting author: Liuyang Shen; Lei Wang: Northeast Agricultural University, Harbin City, Heilongjiang Province, China (Liuyang Shen, Lei Wang, Xianzhe Zheng) 1900670
Tuesday, July 9

223 Physical Properties Related to Drying and Storage

Tuesday, July 9, 9:30am-12:00pm
Location: Columbus II
Sponsored by: PRS-702; PRS-701
Moderator: Igathinathane Cannayen, North Dakota State University, Fargo, ND

9:35am  Feasibility of Real-Time Monitoring and Early Detection of Insect Activity in Storage Rice Using Imaging Technique  
  Presenting author: Rabag Khir, University of California, Davis, Davis, CA (Hui Luo, Cameo Tsui, Zhongli Pan) 1900480

9:50am  Assessment of New Approaches for On-Farm, In-Bin Chilling Aeration and Drying of Rice  
  Presenting author: Soraya Shafiekhani, University of Arkansas, Fayetteville, AR (Soraya Shafiekhani, Griffiths Atungulu) 1901575

10:05am  Walnut Drying with Stepwise Change in Air Temperature for Energy Saving and Quality Preservation  
  Presenting author: Chang Chen, Department of Biological and Agricultural Engineering, University of California Davis, Davis, CA (Chandrasekar Venkitasamy, Weipeng Zhang, Rabag Khir, Zhongli Pan) 1900368

10:20am  Modelling the Drying Kinetics of Dried Maize in a Solar Biomass Hybrid Dryer  
  Presenting author: Samuel McNeill, University of Kentucky, Princeton, KY (Joseph Akowuah, Dirk Maier, George Opit, Samuel McNeill, Paul Armstrong, Carlos Campabadal, Kingsley Ambrose, George Obeng-Akrofi) 1901795

10:35am  BREAK

10:45am  Effects of Liquid Smoke Infusion on Osmotic Dehydration Kinetics and Microstructural Characteristics of Apple Cubes  
  Presenting author: Kaushlendra Singh, West Virginia University, Morgantown, WV0 (Felix Akharume, Litha Sivanandan) 1901340

11:00am  Investigation of Key Engineering Properties of Commonly Used Hermetic Crop Storage Bags  
  Presenting author: Ma. Cristina Concepcion D. Ignacio, Iowa State University, Ames, IA (Dirk E. Maier) 1901344

11:15am  Functionalization of Dry High-Protein and High-Fibre Legume Fractions Using Semi-Direct Cold Atmospheric Pressure Plasma  
  Presenting author: Oliver Schlüter, Leibniz Inst. Agric. Eng. and Bioeconomy, Potsdam, Brandenburg Germany (Sara Büßler) 1901173

224 ASE—Applied Science & Engineering POSTER SESSION

Tuesday, July 9, 2:30pm-5:00pm
Posters will be displayed for the entire session, but authors will be present at posters as follows:
2:30pm-3:45pm, authors with ODD numbered posters present
3:45pm-5:00pm, authors with EVEN numbered posters present
Location: Gloucester
Sponsored by: ASE
Moderator: David Lanning, Forest Concepts LLC, Auburn, WA

1  Reconstruction of Wound Tree Using 3D Scanning and Printing Techniques  
   Presenting author: Joo Lee, Sunchon National Univ, Suncheon sj, Jeollanam-do, Republic of Korea (Joo Lee, Taeyoung An, Sung Hyuk Kim, Kyeong Sik Choi, Kijeong Hong, Hoon Seonwoo) 1901028

2  Impact of Land Development and Climate Change on Flood Risk in the Blue River Watershed  
   Presenting author: Jessica Stanton, Education, Manhattan, KS (Stacy Hutchinson, Kelsey McDonough) 1900930

3  Multi-Variable Sensitivity Analysis, Calibration, and Validation of a Field-Scale SWAT Model: Building Stakeholder Trust in Hydrologic/Water Quality Modeling  
   Presenting author: Ritesh Karki, Auburn University, Auburn, AL (Ritesh Karki, Puneet Srivastava, Latif Kalin, Jasmeet Lamba, David D. Bosch) 1901362

4  Parameterization and Sensitivity Analysis for Integrated Food Energy Water Nexus Framework  
   Presenting author: Kyle Proctor, Oregon State University, Corvallis, OR (Ganti S. Murthy, Seyed Mohammad Hossein Tabatabaei) 1900869

5  Removal of Pesticides and Recovery of Plant Nutrients from Nursery Wastewater through Biochar Columns  
   Presenting author: Kyle Proctor, Oregon State University, Corvallis, OR (Durga Madhab Mahapatra, Kyle Proctor, Ganti S Murthy) 1900977

6  Development of Fractional Vegetation Coverage Acquisition System for Summer Maize Based on Android  
   Presenting author: Wei Yang, China Agricultural Univeristy, Beijing, China (Ziyuan Hao, Wei Yang, Minzan Li, Yuqing Chen) 1901471

7  Energy Efficiency and Economic Analyses of an Anaerobic Digestion-Based Biorefinery for the Recovery of Energy, Nutrients and Water from Agricultural Wastes  
   Presenting author: Lijun Wang, North Carolina A&T State University, Greensboro, NC (Lijun Wang, Gail Joseph, Bo Zhang, Abolghasem Shbahi) 1901136

8  Expression of Oil from Lagenaria siceraria Seed Using Mechanical Oil Expeller  
   Presenting author: Rama Chandra Pradhan, National Institute of Technology, Rourkela, Okisha India (Avinash Singh Patel, Sabyasachi Mishra) 1901081

9  Water Activity Change of Egg Powders at Elevated Temperatures Modeled by Clausius Clapeyron Equation  
   Presenting author: Marco Esteban Pérez Reyes, Washington State University, Pullman, WA (Marco Esteban Pérez Reyes, Juming Tang, Mei-Jun Zhu, Gustavo Barbosa Cánovas) 1901211

10  Calculation and Simulation of Thin-walled Ring Elastic Deformation for Buffer Structure  
    Presenting author: Min Zhou, China Agricultural University, Beijing, China (Yuping Cui, Guolei Zheng, Min Zhou) 1900134

11  Effect of Within Field Soil Variability on Potato Tuber Yield  
    Presenting author: Humna Khan, University of Prince Edward Island, Charlottetown, PEI, Canada (Humna Khan, Aitazaz Farooque, Bishnu Acharya, Travis Esau) 1900332

12  Economic Performance of Different Paddy Storage Technologies in Bangladesh  
    Presenting author: Md Monjurul Alam, Bangladesh Agricultural University, Mymensingh, Bangladesh (Md. Abdul Awal, Mohammad Afzal Hossain, Md. Rostom Ali, Fakir Azmal Huda, Md. Monjurul Alam) 1901474

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Tuesday, July 9

13 Sustainable Treatment for High Iron Concentration in Groundwater for Irrigation Purposes  • Presenting author: Karim Shahin, National Training Academy, Giza, Egypt (Karim Shahin, AE Ahmed, SM Ismail, AMZ EI-Din) 1900019

14 Eto Estimation to Schedule Irrigation in a Green Wall Using Cropwat  • Presenting author: Jorge Flores Velazquez, Mexican Institute of Water Technology, Morelos Mexico. (Fernando Rojano Aguilar, Ernesto Cruz Rodriguez) 1900223

15 Elemental Analysis of Lobster Waste  • Presenting author: Sara Mikhail, McGill University, Montreal, QC, Canada (Sara Mikhail, Shrikala Kannan, Vijaya Raghavan) 1900746

16 Hydrochar-Based Hierarchical Carbon Nanofibers as Highly Flexible Freestanding Nanofibrous Electrode Material for Supercapacitor  • Presenting author: Abolghasem Shahbazi, NC A&T University, Greensboro, NC (Abolghasem Shahbazim, Spero Gbewonyo, Lifeng Zhang) 1900565

17 Biochar Production and Characterization—An Experimental Comparison between Pyrolysis and Hydrothermal Carbonization  • Presenting author: Abolghasem Shahbazi, NC A&T University, Greensboro, NC (Abolghasem Shahbazim, Aicha Slassi Sennou) 1900568

18 Effect of Spray Aids on Particle Size Distribution and Spray Uniformity of Droplets  • Presenting author: Chen Xiao, NRIAM, Nanjing, Jiangsu China (Dejiang Liu, Yan Gong, Xiao Chen, Guo Wang, Xiao Zhang) 1901523

19 Distribution of the Nutrients from Ferti-Release Polymers in Sandy Soil  • Presenting author: Claudinei Souza, UFSCar, Araras, Sao Paulo Brazil (Marilia Silva, Julia Simione, Roselena Faez) 1900246

20 Microwave Pyrolysis of Biomass and Waste Plastics over Chemically-Activated Porous Carbons from Wood  • Presenting author: Elmar Villota, Washington State University, Richland, WA (Elmar Villota, Hanwu Lei, Moriko Qian, Wendy C. Mateo, Dengle Duan, Yunfeng Zhao) 1900834

21 Wood-Based Catalyst and Its Application for the Production of Platform Chemicals  • Presenting author: Guillermo Alberto Portillo Perez, McGill University, Montreal, Quebec, Canada (Marie-Josee Dumont) 1900074

22 Effect of Pyrolysis Temperature on the Thermal Stability and Physicochemical Characteristics of Biochars Produced from Herbaceous Biomass  • Presenting author: Kaushlendra Singh, West Virginia University, Morgantown, WV (Oluwatosin Oginni, Litha Sivanandan) 1901590

23 Comprehensively Characterization ofChars Derived from Different Parts of Porcine Bone  • Presenting author: Mengyan Wang, China Agricultural University, Beijing, China (Mengyan Wang, Ye Liu, Lujia Han, Xian Liu) 1901558

24 Microstructural and Physicochemical Characteristics of Woody Biomass Derived Activated Carbons Using MgCl2  • Presenting author: Oluwatosin Oginni, West Virginia University, Morgantown, WV (Kaushlendra Singh) 1900610

25 Preparation of Magnetic Biochar-Based Solid Acid and Its Nano-Effect on Cellulose  • Presenting author: Yunfeng Zhao, Washington State University, Richland, WA (Yunfeng Zhao, Hanwu Lei, Dengle Duan) 1900893

54 Application Design for Manufacture and Assembly to Improving Product Design and Development Performance  • Presenting author: Chenggang Yin, China Agricultural University, Beijing, China (Chenggang Yin, Shulin Hou) 1900289

66 Study on the Equipment and Technology of High-Temperature Airtight Fermentation of Manure  • Presenting author: Hongying Wang, China Agricultural University, Beijing, China (Juan Ma, Jian Su, Hao Li, Lingzhou Kong, Jie Zhang, Paheerding Abulaiti, Nan Jin, Bin Feng, Hongying Wang) 1900319

73 Hydrochar from Sewage Sludge and Manure as Soil Amendment  • Presenting author: Luis Huezo, The Ohio State University, Wooster, OH (Luis Huezo, Ayaj Shah) 1901199

123 Heat and Mass Transfer Modeling in Baled Switchgrass  • Presenting author: Drew Schiavone, University of Maryland Western Maryland Research and Education Center, Keedysville, MD (Michael Montross) 1900547

225 Resource Development for Agricultural and Biological Engineering Challenges in Africa, China, and India—INVITED

Tuesday, July 9, 2:30pm-5:00pm
Location: Columbus II
Sponsored by: E-2050; PRS-702; EOPD-205; ES-100; ESH-04
Moderator: Senorpe Asem-Hiablle, USDA ARS, University Park, PA

2:35pm Resource Development for Agricultural and Biological Engineering Challenges in China  • Presenting author: Baoming Li, China Agricultural University, Beijing China (Baoming Li) 1901949

3:05pm Resource Development for Agricultural and Biological Engineering Challenges in India  • Presenting author: Indra Mani, President, Indian Society of Agricultural Engineers, New Delhi, India 1901951

3:35pm BREAK

3:45pm Resource Development for Agricultural and Biological Engineering Challenges in Africa  • Presenting author: Michael Ngadi, Fellow of the Canadian Society for BioEngineering, Professor, McGill University, Montreal, Quebec, Canada (Vara Prasad) 1901950

226 Improving Student Learning One Course at a Time
Tuesday, July 9, 2:30pm-5:00pm
Location: Salon I
Sponsored by: EOPD-203
Moderator: David Mabie, University of Nebraska, Lincoln, NE

2:35pm Practice: Designing, Modeling, and Building a Small Grain Dryer; Theory: Fluids, Psychrometrics, Thermodynamics  • Presenting author: Gregory Osborn, University of Arkansas, Fayetteville, AR (Gregory Osborn) 1900604

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Tuesday, July 9

2:50pm  A Project-Based, International Course about Ecological Engineering  •  Presenting author: O. Grant Clark, McGill University, Ste-Anne-de-Bellevue, Quebec Canada (O. Grant Clark, Thomas G. Franti) 1900841

3:05pm  Development and Evaluation of a Variable Frequency Drive Educational Trainer  •  Presenting author: Donald M. Johnson, University of Arkansas, Fayetteville, AR (Colton Teekell, Patterson Hilaire, Donald M. Johnson) 1901298

3:20pm  Introduction of 3D Printers into ABE Machine Design Classes  •  Presenting author: Robert M. Stwalley III, Purdue University Agricultural & Biological Engineering, West Lafayette, IN (Claire E. Haselhorst, Carol S. Stwalley, & Robert M. Stwalley III) 1901396

3:35pm  BREAK

3:45pm  Reliable Low Cost CAN-Logger for Off-road Vehicles Engineering Education and Research  •  Presenting author: Omer Ahmed Omer Abubakr, University of Khartoum, Khartoum, Sudan (A. F. Kheiralla, Omer A. Abubakr, Mutaz A. Gamal) 1900686

4:00pm  Bringing Indigeneity to the BSE Classroom  •  Presenting author: Qualla Ketchum, Virginia Tech, Blacksburg, VA (W. Cully Hession) 1901808

4:15pm  Innovative Campus Outdoor Laboratory Development and Integration into Academic Programs  •  Presenting author: Andrea Ludwig, University of Tennessee, Knoxville, TN (Tim Gangaware, Chris Graves, Garrett Ferry) 1901175

227 ES—Energy Systems POSTER SESSION
Tuesday, July 9, 2:30pm-5:00pm
Posters will be displayed for the entire session, but authors will be present at posters as follows:
2:30pm-3:45pm, authors with ODD numbered posters present
3:45pm-5:00pm, authors with EVEN numbered posters present
Location: Gloucester
Sponsored by: ES-220; MS-23/7/2; PRS-701; ASE-12; ES-01
Moderator: Ganti Murthy, Oregon State University, Corvallis, OR

26  Co-Pyrolysis of Microalgae, Sludge and Lignocellulosic Biomass for Aromatic Hydrocarbon Production  •  Presenting author: Sourabh Chakraborty, Oklahoma State University, Stillwater, OK (Sourabh Chakraborty, Nurhan Dunford) 1901682

27  Development of Heterogeneous Catalysts with Novel Properties for Hydrogen Production from Biomass  •  Presenting author: Boanerges Elias Bamaca Saquic (Boanerges Elias Bamaca Saquic, Sibel Irmak, Mark Wilkins) 1901829

28  Physical Properties of Solid Biofuel Pellets from Microbially Pretreated Camelina Straw and Switchgrass  •  Presenting author: Cuong Dao, University of Saskatchewan, Saskatoon, Saskatchewan Canada (Cuong Dao, Lope Tabli, Edmund Mupondwa, Tim Dumoncheaux) 1901269

29  Sandwiched SiO2@Ni@ZrO2 as a Coke Resistant Nanocatalyst for Carbon Dioxide Reforming with Addition of Methane  •  Presenting author: Fei Yu, Mississippi State University, Mississippi State, MS (Jian Dou) 1900012

30  Comparison of Mesophilic and Thermophilic Co-Digestion of Swine Manure with Corn Core for Methane Production  •  Presenting author: Leipeng Cao, The Ohio State University, Wooster, OH (Fuqing Xu, Harold Keener) 1901706

31  Using Cyanobacteria to Simultaneously Remediate Aquacultural Wastewater and Produce Bioethanol  •  Presenting author: Rifat Hasan, NCSU, Raleigh, NC (Ashley Beck, Steven Hall) 1901322

32  Environmental Life Cycle Assessment of Pennycress Production as Feedstock for Aviation Biofuel  •  Presenting author: Seyed Hashem Mousavi Avval, The Ohio State University, Wooster, OH (Ajay Shah) 1901658

33  Life Cycle Assessment of Lactic Acid Production Using Corn Grain and Corn Stover  •  Presenting author: Ashish Manandhar, The Ohio State University, Wooster, OH (Ashish Manandhar, Ajay Shah) 1901646

34  Techno-Economic and Life-Cycle Analysis of Lignocellulosic Materials Pretreatment Approaches for Acetone-Butanol-Ethanol (ABE) Fermentation  •  Presenting author: Kurt A. Rosentrater, Iowa State University, Ames, IA (Nazira Mahmud, Kurt A. Rosentrater) 1901863

35  Experimental Determination of the Drying Rate of Cocoa Beans (Theobroma cacao)  •  Presenting author: Okonkwo Wilfred Ifeanyi, University of Nigeria, Nsukka, Enugu State, Nigeria (Okonkwo W. I., E. T. Okorie) 1900245

36  Influence of Varying Light Wavelengths on the Biomass Productivity of a Microalgal Consortia Cultivated on Simulated Dairy Effluent  •  Presenting author: Bhalamurugan Gatamaneni Loganathan, McGill University, Saint Anne de Bellevue, Quebec Canada (Valerie Orsat, Mark Lefsrud) 1900145

37  Designing Biomass Logistics Systems to Supply Bioderived Materials and Biofuels Markets  •  Presenting author: Erin Webb, Oak Ridge National Laboratory, Oak Ridge, TN (Robin Clark, Soydan Ozcan, Halil Tekinalp, Xianhui Zhao, Nikki Labbe) 1901281

38  Effect of Torrefaction on Glucose Yield of Wheat Straw  •  Presenting author: Jaya Tripathi, Penn State University, PA (Jaya Tripathi) 1901899

39  Develop Biopolymer Based Nanocomposite Films by Combination of Cellulose Nanocrystal (CNC) and Polyactic Acid (PLA)  •  Presenting author: Lin Wei, South Dakota State University, Brookings, SD (Zeyad Albahr, Lin Wei) 1900582

40  Characterization of Bionanocomposite Films Based on Lignocellulose and Activated Carbon  •  Presenting author: Lin Wei, South Dakota State University, Brookings, SD (Abdus Sobhan, Kasiviswanathan Muthukumarappan, Lin Wei) 1900618

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Tuesday, July 9

228 ESH—Ergonomics, Safety, & Health POSTER SESSION
Tuesday, July 9, 2:30pm-5:00pm
Posters will be displayed for the entire session, but authors will be present at posters as follows:
2:30pm-3:45pm, authors with ODD numbered posters present
3:45pm-5:00pm, authors with EVEN numbered posters present
Location: Gloucester
Sponsored by: ESH-01
Moderator: Gretchen Mosher, Iowa State University, Ames, IA

53 Modeling Retrofit Anchor Points for On-Farm Grain Bin Structures • Presenting author: Michael L. Dyer, Penn State University, University Park, PA (Michael Dyer, Michael L. Pate) 1900751

55 Socio-Technical Features and Performance Impact Factors in New Product Development Processes • Presenting author: Chenggang Yin, China Agricultural University, Beijing, China (Chenggang Yin, Ruling Hong, Jianmin Jia) 1900290

56 Survey Design in Supporting of Product Design and Development: A Case Study • Presenting author: Chenggang Yin, China Agricultural University, Beijing, China (Chenggang Yin, Yiyang Wang, Haiqiang Wang) 1900291

57 Universal Foldable ROPS Lift Assist Designs with Torsion Spring • Presenting author: Paul Ayers, University of Tennessee, Knoxville, TN (Farzaneh Khorsandi, Mathew Poland, Cameron Hilliard) 1900615

58 Prediction of the Trend of Antimicrobial Resistance of Escherichia coli in Livestock and Poultry • Presenting author: Yang Shenghui, China Agricultural University, Beijing, China (Li Jianping, Ma Hengtai, Xu Ding, Peng Pengxing, Yang Shenghui, Zheng Yongjun) 1901053

59 Development of an Ergonomic Evaluation System Based on Inertial Measurement Unit and its Application for Exoskeleton Load Reduction • Presenting author: Hsu,Chi-Fang, Taipei, Taiwan (Ta-Te Lin) 1901464


229 3D Machine Vision for Sensing and Automation
Tuesday, July 9, 2:30pm-5:00pm
Location: Salon H
Sponsored by: ITSC-312
Moderator: Seung Chul Yoon, USDA ARS, Athens, GA

2:35pm 2D and 3D Sensor Fusion for Rapid Detection of Woody Breast Myopathy in Broiler Chickens • Presenting author: Seung-Chul Yoon, USDA-ARS, Athens, GA (Seung-Chul Yoon, Bin Pang, Yi Yang, Hong Zhuang, Brian Bowker, Kurt C. Lawrence) 1901883
Tuesday, July 9

2:50pm  Development of the Mushroom Harvesting Assistance System Using Computer Vision  
• Presenting author: Cheng-Hao Lee, The Pennsylvania State University, University Park, PA (Daen Chol, John Pecchia, Long He, Paul Heinemann) 1900505

3:05pm  Development of a 3D Multispectral Imaging System Using Structured Light  
• Presenting author: Xueping Ni, University of Georgia, Athens, GA (Xueping Ni, Changying Li, Huanyu Jiang) 1900436

3:20pm  Automated Plant Node Detection Using Terrestrial LiDAR Data under Field Conditions  
• Presenting author: Jiangtao Ji, Technology, Luoyang, Henan, China (Kaixuan Zhao, Jeffrey M. Bewley, Zhang, Manoj Karkee, Qin Zhang) 1900448

3:35pm  BREAK

3:45pm  Blossom Detection in Apple Trees for Selective Blossom Thinning  
• Presenting author: Uddhav Bhattarai, Washington State University, Pullman, WA (Uddhav Bhattarai, Santosh Bhusal, Yaqoob Majeed, Manoj Karkee) 1901629

4:00pm  Apple Detection in Fruiting Wall Architecture Trees Using RGB and Depth Features Based on Faster R-CNN  
• Presenting author: Longsheng Fu, Northwest A&F University, Yangling, Shaanxi China (Xin Zhang, Yaguang Zhong, Manoj Karkee, Qin Zhang) 1900448

4:15pm  Real-Time Corn Grain Depth and Volume Measurement Device Using Stereo Vision  
• Presenting author: Matthew Rogers, Purdue University, West Lafayette, IN (Robert Clark Stevens) 1900422

4:30pm  Optical Measurement of Degree of Fill and Discharge Rate in a Lab-Scale Storage Vessel  
• Presenting author: Miles Grafton, Massey University, Palmerston North, Manawatu, New Zealand (Mohammad Barzegar, Clive Davies, Gabe Redding, Luke Fullard) 1900436

4:45pm  Semantic Segmentation of Sparse 3D Point Cloud Based on Geometrical Features for Trellis Structured Apple Orchard  
• Presenting author: Long He, Pennsylvania State University, University Park, PA (Lihua Zeng, Juan Feng, Long He) 1901390

5:00pm  Automatic Body Condition Scoring System Based on Curvature and Visibility Analysis Using Depth Images  
• Presenting author: Kaixuan Zhao, Henan University of Science and Technology, Luoyang, Henan, China (Kaixuan Zhao, Jeffrey M. Bewley, Anthony N. Shelley, Daniel L. Lau, Jiangtao Ji) 1900501

230 Advances in Spectroscopy and Hyperspectral Properties of Biological Products  
Tuesday, July 9, 2:30pm-5:00pm  
Location: Salon K  
Sponsored by: ITSC-348; PRS-701  
Moderator: Lav Khot, Washington State University, Prosser, WA

2:35pm  Early Grapevine Leafroll Disease Diagnosis Using Hyperspectral Imaging Combined with Convolutional Neural Network  
• Presenting author: Zongmei Gao, Washington State University, Prosser, WA (Lav R. Khot, Qin Zhang, Rayapatla A. Naidu) 1900833

2:50pm  Cultivars Classification of Single Sweet Corn Seed Using Fourier Transform Near-Infrared Spectroscopy Combined with Discriminant Analysis  
• Presenting author: Guangjun Qiu, Oklahoma State University, Stillwater, OK (Guangjun Qiu, Enli Lü, Ning Wang, Huazhong Lu) 1901865

3:05pm  Laser Induced Fluorescence Hyperspectral Imaging (LIF-HSI) for Aflatoxin B1 Detection in Pistachio Kernels  
• Presenting author: Qifang Wu, Zhejiang University, Hangzhou, Zhejiang, China (Qifang Wu, Hao Tian, Huirong Xu) 1900103

3:20pm  SiriTool: A Matlab Graphical User Interface for Image Analysis in Structured-illumination Reflectance Imaging for Fruit Defect Detection  
• Presenting author: Yuzhen Lu, USDA/ARS, East Lansing, MI (Renfu Lu) 1900169

3:35pm  BREAK

3:45pm  Determining Damage Levels in Wheat Caused by Sunn Pest (Eurygaster integriceps) Using Visible and Near-Infrared Spectroscopy  
• Presenting author: Paul Armstrong, USDA-ARS, Manhattan, KS (Paul Armstrong, Elizabeth Maghirang, Mehmet Ozulu) 1900178

4:00pm  WSN Detection and Recognition of Rice Rust Disease Based on Hyperspectral Imaging  
• Presenting author: Paul Oppong Kwabena, Jiangsu University, Zhenjiang, Jiangsu China (Mao Hanping, Ning Yang, Li Lin) 1900131

4:15pm  Identification of Rice Leaf Blast Using Hyperspectral Imaging  
• Presenting author: Susu Zhu, Zhejiang University, Hangzhou, Zhejiang Province, China (Lei Feng, Yong He) 1900311

4:30pm  On-line evaluation of Watercore in Apples by Visible/Near Infrared Spectroscopy  
• Presenting author: Han Chang, Zhejiang University, Hangzhou, Zhejiang, PR China. (Han Chang, Qifang Wu, Jinshan Yan, Xuan Luo, Huirong Xu) 1900308

4:45pm  Detection of Subsurface Bruising in Tomatoes of Different Ripening Stages Using Structured-Illumination Reflectance Imaging  
• Presenting author: Hao Lin, Michigan State University, Lansing, MI (Hao Lin, Yuzhen Lu, Renfu Lu) 1900354

5:00pm  Near Infrared Spectroscopy Internal Quality Detection Based on Characteristic Wavelength  
• Presenting author: Pengkun Quan, Northwest A&F University, Yangling, Shaanxi China (Pengkun Quan, Juan Zhao, Mengsheng Zhang, Haihui Zhang) 1900500

231 Cloud Computing and Internet of Things in Agriculture  
Tuesday, July 9, 2:30pm-5:00pm  
Location: Boston University  
Sponsored by: ITSC-254; ITSC-217  
Moderator: Hasan Seyyedhasani, University of California, Davis, CA

2:35pm  A Tutorial on Wireless Communication Protocol Selection for Digital Agricultural Applications  
• Presenting author: Yang Wang, Purdue University, West Lafayette, IN (Yaguang Zhang, Andrew Balmos, Dennis Buckmaster, James Krogmeier) 1901287

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
2:50pm  The Merits of an Agricultural Vehicle to Vehicle Mesh WiFi Network  • Presenting author: Andrew D Balmos, Purdue University, West Lafayette, IN (Yaguang Zhang, Yang Wang, James Krogmeier) 1901531

3:05pm  Connectivity for IoT Solutions in Integrated Dairy Farming in Germany  • Presenting author: Maximilian Treiber, Technical University of Munich, Chair of Agricultural Systems Engineering, Freising, Bavaria, Germany (Maximilian Treiber, Martin Höhendinger, Harald Rupp, Natascha Schlereth, Josef Bauerdick, Heinz Bernhardt) 1900561

3:20pm  Iris: Tuning the Configuration Parameters of NoSQL Databases for High-Throughput Digital Agricultural Processing Pipelines  • Presenting author: Somai Chaterji, Purdue Univ, W Lafayette, IN (Ashraf Mahgoub, Somai Chaterji) 1900330

3:35pm  BREAK

3:45pm  Smart Farms and the Digital Age—A Reality  • Presenting author: Leon Schumacher, University of Missouri, Columbia, MO (Jianfeng Zhou) 1901857

4:00pm  Trellis++: A Practical Privacy-Preserving Food Safety Framework  • Presenting author: Servio Palacios, Purdue University, West Lafayette, IN (Servio Palacios, Aaron Ault, Alexander W. Layton, Samuel Noel, Yang Wang, Andrew Balmos, James Krogmeier, Dennis Buckmaster, Bharat Bhargava) 1901553

4:15pm  Blockchain and its Applications in Food Production System  • Presenting author: Azar Alizadeh, University of California Merced, Merced, CA (Azar Alizadeh, Mukesh Singhal, Reza Ehsani) 1901000

4:30pm  Internet of Things Based System for Crop Loss Management: Prototyping a Visible-Infrared and Microclimate Sensing Derived Apple Fruit Sunburn Monitoring System  • Presenting author: Rakesh Ranjan, Washington State University, Prosser, WA (Rakesh Ranjan, Guobin Shi, Lav R Khot) 1901249

4:45pm  Development of a Wireless Sensor Network to Monitor Rainfall, Temperature, and Relative Humidity at Farm Scale Level  • Presenting author: Thiago Borba Onofre, University of Florida, Gainesville, FL (Thiago Borba Onofre, Clyde Fraisse) 1901296

5:00pm  Amazon Web Services for Storing and Processing Sensor Outputs  • Presenting author: Tristan Chauvin-Bosse, McGill University, Sainte-Anne-de-Bellevue, Quebec Canada (Mark Lefsrud, David Leroux, Ryan Knight, Samuel Bilodeau) 1900859

5:15pm  Development of a Framework for Internet of Things (oT)-Based Precision Farming  • Presenting author: Jianfeng Zhou, University of Missouri, Columbia, MO (Leon Schumacher, Jianjun Yin) 1900611

5:30pm  IoT Based Real-Time Position Tracking and Engine Status Monitoring System of an Agricultural Tractor  • Presenting author: Prateek Shrivastava, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India (Prateek Shrivastava, V K Tewari) 1900757

232 Machine Vision Applications in Animals and Animal Products

Tuesday, July 9, 2:30pm-5:00pm

Location: MIT

Sponsored by: ITSC-312

Moderator: Yan-Fu Kuo, National Taiwan University, Taipei, Taiwan China

2:35pm  Estimating Shrimp Body Length Using Deep Convolutional Neural Network  • Presenting author: Hong-Yang Lin, Department of Bio-Industrial Mechatronics Engineering, NTU, Taipei, Taiwan (Hong-Yang Lin, Woei-Ling Ng, Jyh-Nain Pai, Yuan-Nan Chu, Chyng-Hwa Liou, Kuo-Chi Liao, Yan-Fu Kuo) 1900724

2:50pm  Determining the Body Condition Scores of Sows Using Convolutional Neural Networks  • Presenting author: Mao-Hsiang Huang, Department of Bio-Industrial Mechatronics Engineering, NTU, Taipei, Taiwan (Mao-Hsiang Huang, En-Chung Lin, Yan-Fu Kuo) 1900915

3:05pm  Detecting and Counting Harvested Fish and Measuring Fish Body Lengths in Video Using Deep Learning Methods  • Presenting author: Chi-Hsuan Tseng, Department of Bio-Industrial Mechatronics Engineering, NTU, Da’an Dist., Taipei City Taiwan (Yi-Chin Lu) 1900408

3:20pm  Identifying Species of Common Sea Fish Harvested by Longliner Using Deep Convolutional Neural Networks  • Presenting author: Yi-Chin Lu, Department of Bio-Industrial Mechatronics Engineering, NTU, Taipei Taiwan (Yi-Chin Lu) 1900399

3:35pm  BREAK

3:45pm  Individual Identification of Holstein Dairy Cows Based on Detecting and Matching Feature Points in Body Images  • Presenting author: Kaixuan Zhao, Henan University of Science and Technology, Luoyang, Henan, China (Kaixuan Zhao, Xing Lin, Jun Wang, Xuefeng Zhu) 1900627

4:00pm  Optimal Camera Placement for Visual Sensing of Livestock Animals during Confined Transport  • Presenting author: Joshua Peschel, Iowa State University, Ames, IA (Joshua Peschel) 1901342

4:15pm  Computer Vision Technology in Fish Farming  • Presenting author: Daoliang Li, China Agricultural University, Beijing, China (Daoliang Li Yinfeng Hao) 1900377

4:30pm  Shell Egg Quality Determination with Machine Vision  • Presenting author: Kurt Lawrence, USDA, ARS, Athens, GA (Kurt Lawrence, Seung Chul Yoon, Gerald Heitschmidt, Tae-Sung Shin) 1901559

4:45pm  Classification of Eggs into Damaged and Undamaged Categories Using Machine Learning Techniques  • Presenting author: Bhavya Botta, Agricultural and Food Engineering Department, Indian Institute of Technology, Kharagpur, West Bengal India (Ashis Kumar Datta, Gattam Sai Svaroop Reddy) 1901240

5:00pm  Damage Detection on Chicken Eggshells Using Faster R-CNN  • Presenting author: Ashis Kumar Datta, Agricultural and Food Engineering Department, Indian Institute of Technology, Kharagpur, West Bengal, India (Gattam Sai Svaroop Reddy, Ashis Kumar Datta) 1901244
Tuesday, July 9

5:15pm  An Online Unsupervised Deep Learning Approach for an Automated Pest Insect Monitoring System  •  Presenting author: Dan Jeric Arcega Rustia, National Taiwan University, Taipei City Taiwan (Dan Jeric Arcega Rustia, Jun-Jee Chao, Jui-Yung Chung, Ta-Te Lin) 1900174

233 UAV for Sensing, Imaging, and Agricultural Aquacultural Applications Part I
Tuesday, July 9, 2:30pm-5:00pm
Location: Harvard
Sponsored by: ITSC-318
Moderator: Daniel Jenkins, University of Hawaii, Honolulu, HI

2:35pm  High-Throughput Sensing to Evaluate Irrigation Treatment Responses in Quinoa Varieties  •  Presenting author: Sindhuja Sankaran, Washington State University, Pullman, WA (Carlos Zúñiga, Leonardo Hinojosa, Kevin Murphy) 1901360

2:50pm  Estimation of Maturity Date of Soybean Breeding Lines Using UAV-Based Imagery  •  Presenting author: Jing Zhou, University of Missouri, Columbia, MO (Jing Zhou, Dennis Yungbluth, Chin Vong, Andrew Scaboo, Jianfeng Zhou) 1900427

3:05pm  Remote Quantification of Land Surface Temperature and Evapotranspiration Using Thermal Infrared Observations from UAVs  •  Presenting author: Darren Drewry, Ohio State University, Columbus, OH (Debsunder Dutta, Kaniska Mallick, William Johnson, Roland Brockers) 1901711

3:20pm  Data Collection by Unmanned Aircraft Systems (UAS) to Develop Variable Rate Prescription Maps for Cotton Plant Growth Regulators and Defoliants  •  Presenting author: Gary Roberson, North Carolina State University, Raleigh, NC (Gary Roberson, John Classen, Jason Osborne) 1900148

3:35pm  BREAK

3:45pm  Data-Driven Precision Agricultural Applications Using Field Sensors and Unmanned Aerial Vehicle (UAV)  •  Presenting author: Rohit Pathak, Mississippi State University, Starkville, MS (Ganesh C. Bora, Razieh Barzin) 1901527

4:00pm  Band-to-Band Image Registration Using Deep Learning Based Features  •  Presenting author: Haoyu Niu, University of California, Merced, CA (Tiebiao Zhao, Alexander Koumis, Haoyu Niu, Dong Wang, YangQuan Chen) 1901839

4:15pm  Evaluation of In-Field-Crop Sensors and UAS Imagery for Variable Rate N Application  •  Presenting author: Razieh Barzin, Mississippi State University, Starkville, MS (Ganesh C. Bora, Rohit Pathak) 1901671

4:30pm  Estimating Evapotranspiration with UAVs in Agriculture: A Review  •  Presenting author: Haoyu Niu, University of California, Merced, CA (Haoyu Niu, Tiebiao Zhao, Dong Wang, YangQuan Chen) 1901226

4:45pm  Deep Autoencoder to Reduce Dimensionality of Hyperspectral Images Collected by UAV Flying Over Experimental Plots  •  Presenting author: Ali Moghimi, Department of Bioproducts and Biosystems Engineering, University of Minnesota, St. Paul, MN (Ali Moghimi, Ce Yang, James A. Anderson, Susan K. Reynolds) 1900814

234 Advances in Cotton Engineering
Tuesday, July 9, 2:30pm-5:00pm
Location: Brandeis
Sponsored by: MS-23/7/3
Moderator: Wesley Porter, University of Georgia, Tifton, GA

2:35pm  Consideration of Planter Parameters, Seed Vigor, and Field Conditions for Improving Crop Emergence and Yield in Cotton  •  Presenting author: Simerjeet Virk, University of Georgia, Tifton, GA (Wesley Porter, John Snider, Jared Whitaker) 1901107

2:50pm  Preliminary Evaluation of Mapping Cotton Quality  •  Presenting author: Jason Ward, NC State University, Raleigh, NC (Enrique pena, Jason Ward, Terry Griffin) 1901778

3:05pm  Round Cotton Module Handling Logistics and Cover Damage  •  Presenting author: Robert Hardin, Texas A&M, College Station, TX (Tianyi Wang, Jason Ward, John Wanjsura, Ed Barnes) 1901830

3:20pm  An Electronic System for Managing Cotton Modules—System Development Update  •  Presenting author: John Wanjsura, USDA ARS CPPRU, Lubbock, TX (John Wanjsura, Greg Holt, Mathew Pelletier, Ed Barnes) 1901157

3:35pm  BREAK

3:45pm  Results From Testing a Mechanical Preconditioning System for Removing Cottonseed Linters  •  Presenting author: Greg Holt, USDA-ARS, Lubbock, TX (Tom Wedegaertner, John Wanjsura, Mathew Pelletier) 1900159

4:00pm  Commercialization of Plastic Contamination Detection and Removal System for Cotton Gins  •  Presenting author: Mathew Pelletier, USDA-ARS, Lubbock, TX (Greg Holt, Derek Whitelock, John Wanjsura, Paul Funk, Carlos Armijo, Kevin Tran, Marcus Gray, Ivan Bader) 1901338


4:30pm  In-Situ Color and Leaf Measurement Via Image Analysis  •  Presenting author: Chris Delhom, USDA, New Orleans, LA (Chris Delhom) 1900298

4:45pm  Evaluation of Prototype High-Capacity Roller-Gin Reclaimers  •  Presenting author: Derek Whitelock, USDA-ARS, Las Cruces, NM (Derek Whitelock, Carlos Armijo, Paul Funk) 1901880

5:15pm  Preliminary Results of How Conventional and Experimental Lint Cleaning Processes Affect Fiber Length Uniformity Index  •  Presenting author: Carlos Armijo, USDA-ARS (Carlos B. Armijo, Christopher D. Delhom, Derek P. Whitelock, Paul A. Funk, John D. Wanjsura, Gregory A. Holt, Ruixiu Sui, Vikki B. Martin, Neha Kothari) 1901902

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235 Automation and Robotics for Fruit, Vegetables, and Other Specialty Crops
Tuesday, July 9, 2:30pm-5:00pm
Location: Northeastern
Sponsored by: MS-48; MS-54; ITSC-318
Moderator: Yiannis Ampatzidis, University of Florida, Immokalee, FL

2:35pm High Speed Centimeter Scale Resolution Sprayer for Precision Weed Control  
Presenting author: Mark C. Siemens, University of Arizona, Yuma, AZ (Víctor Godínez, Jr.) 1901673

NO-SHOW Design and Implementation of Automatic Seeding Transplanter with Seedling Leakage Detection  
Presenting author: Xin Jin, Henan University of Science and Technology, Luoyang, Henan, China (Kaixuan Zhao, Shengsheng Wang, Jianguo Ji, Hao Ma) 1900682

3:05pm Physical and Mechanical Experiments for Designing Cabbage Precision Trimming Device  
Presenting author: Cui Gongpei, Northwest A&F University, Yangling, Shaanxi China (Cui Gongpei, Zheng Xinmeng, Wang Jingzheng, Yang Chen, Liu Zhihao, Cui Yongjie) 1901420

3:20pm Leveraging Deep Learning and RGB-D Cameras for Cooperative Apple-Picking Robot Arms  
Presenting author: Simeon Harbert, Georgia Tech Research Institute, Atlanta, GA (Konrad Ahlin, Ai-Ping Hu) 1901125

3:35pm BREAK

3:45pm Development of a Robotic End Effector for Apple Tree Pruning  
Presenting author: Azlan Zahid, Department of Agricultural and Biological Engineering, Pennsylvania State University, State College, PA (Azlan Zahid, Long He, Matthew Whiting, Manoj Karkee, Qin Zhang) 1900978

4:00pm Field Evaluations on Locally Targeted Shake-and-Catch Apple Harvesting Technology for Fresh Market  
Presenting author: Xin Zhang, Washington State University, Prosser, WA (Xin Zhang, Long He, Matthew Whiting, Manoj Karkee, Qin Zhang) 1900978

4:15pm A New Fruit Removal Head for an Olive Harvesting System  
Presenting author: Taymaz Homayouni, Merced, CA (Taymaz Homayouni, Mohammadmehdi Maharlooei, Arash Mohammadi Toudeshki, Reza Ehsani) 1900996

4:30pm Development of a Wireless Sensor for Measuring the Performance of Mechanical Harvesting Machines for Tree Crops  
Presenting author: Arash Toudeshki, University of California, Merced, CA (Arash Toudeshki, Taymaz Homayouni, Fu Xi Shi) 1900937

4:45pm Mathematical Modelling of the Acceleration Transferred from Trunk to Top Branch of Pistachio Trees during Harvest Using a Trunk Shaker  
Presenting author: Ruijun Ma, University of California, Merced, CA (Ma Ruijun, Arash Toudeshki, Taymaz Homayouni, Reza Ehsani, Zhang Xiaohua) 1901233

236 Automation Systems for Agricultural Field Machinery
Tuesday, July 9, 2:30pm-5:00pm
Location: Tufts
Sponsored by: MS-58; ITSC-318; ITSC-353
Moderator: Aaron Franzen, South Dakota State University, Brookings, SD

NO-SHOW Study on Torque Distribution of Traction Operation of a Rear WHEEL Independent Driven Electric Tractor  
Presenting author: Huadong Zhou, Nanjing Agricultural University, Nanjing, JiangSu China (Huadong Zhou, Zhixiong Lu, Xiaoting Deng) 1901082

2:50pm Development and Evaluation of an Improved Apple Infield Sorting System  
Presenting author: Zhao Zhang, USDA, Lansing, MI (Zhao Zhang, Renfu Lu) 1900745

3:05pm Development of a Driverless Tractor Using Information and Communication Techniques  
Presenting author: Xiang Yin, Shandong University of Technology, Zibo, Shandong, China (Xiang Yin, Yanpu Chen, Chengqian Jin, Juan Du) 1900540

3:20pm Development of Automatic Loading System for Roller-Type Pot-Seeding Machine  
Presenting author: Seok-Joon Hwang, Kangwon National University, Chunchon, Gangwon, Republic of Korea (Seok-Joon Hwang, Ju-Seok Nam) 1900550

3:35pm BREAK

NO-SHOW Development of an Automatic Steering System for Agricultural Vehicles  
Presenting author: Xiang Yin, Shandong University of Technology, Zibo, Shandong, China (Xiang Yin, Min Li, Chengqian Jin, Juan Du) 1900504

4:00pm Optimal Utilization of Autonomous Robotics for Cotton Harvest  
Presenting author: Terry Griffin, Kansas State University, Manhattan, KS (Terry Griffin, Gregg Ibendahl, Ed Barnes, Jon Devine, Ty Griffin) 1901448

NO-SHOW Autonomous Calibration for a Mass-Flow Yield Monitor in a Combine Harvester  
Presenting author: Don Petkau, Department of Biosystems Engineering, University of Manitoba, Winnipeg, MB, Canada (Carly R. Baker, Don Petkau) 1900356

4:30pm RootRobot: A Field-based Platform for Maize Root System Architecture Phenotyping  
Presenting author: Xiaomeng Shi, Penn State University, University Park, PA (Xiaomeng Shi, Daeun Choi, Paul Heinemann, Molly Hanlon, Jonathan Lynch) 1900806

4:45pm Motion Planning for Autonomous Grain Cart  
Presenting author: Lantian Shangguan, Texas A&M University, College Station, TX (Lantian Shangguan, Alex Thomasson, Swaminathan Gopalswamy) 1900379

237 Innovations in Precision Agriculture
Tuesday, July 9, 2:30pm-5:00pm
Location: Tremont
Sponsored by: MS-54; MS-23/6/1
Moderator: Dharmendra Saraswat, Purdue University, West Lafayette, IN

2:35pm Research on Kinematics of Male Parent Panicle of Hybrid Rice Affected by Airflow  
Presenting author: Fuqiang Yao, Zhejiang University, Hangzhou, Zhejiang, China (Fuqiang Yao, Yongwei
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2:50pm  Qualitative Analysis of the Infield Logistics of Agricultural Machinery in Germany  •  Presenting author: Heinz Bernhardt, Technical University of Munich, Freising, Germany (Michael Mederer, Michael Gerl, Heinz Bernhardt) 1900528

NO-SHOW  Use of Thermal Imagery to Identify Stress in Crops Grown in Various Environments and Soil Types  •  Presenting author: Harman Singh Sangha, Kansas State University, Manhattan, KS (Ajay Sharda, William Schapaugh, Lukas Koch, Dylan Walta) 1901589

3:20pm  AEF—Providing Electronic Communication to the Ag Sector for Wireless In-Field Communication  •  Presenting author: Norbert Schlingmann, Agricultural Industry Electronics Foundation, Frankfurt, Germany (Mark Benishek) 1901864

3:35pm  BREAK

3:45pm  Digital Soil Mapping: Comparative Evaluation of Machine Learning and Geostatistical Modeling Methods  •  Presenting author: Jeff Fiechter, Purdue University, West Lafayette, IN (Dharmendra Saraswat) 1900608

4:00pm  Using On-Farm Research Data to Inform Variable Rate Seeding  •  Presenting author: Elizabeth Hawkins, The Ohio State University, Columbus, OH (John Fulton) 1901722

4:15pm  Spatial Relationships between Sensed Corn Populations and Yield  •  Presenting author: Kenneth A. Sudduth, USDA-ARS, Columbia, MO (Kenneth A. Sudduth, Newell R. Kitchen, Scott T Drummond) 1901897

4:30pm  Operational Challenges and Yield Implications of Increasing Corn Planting Speeds  •  Presenting author: Andrew Klopfenstein, The Ohio State University, Columbus, OH (Andrew Klopfenstein, Richard Colley, Ryan Tietje, Chris Wiegman, John Fulton, Scott Shearer) 1901183

4:45pm  Intensive Spatial Data Characterization: A New Method for Identifying Data Relationships in Crop Production  •  Presenting author: Kendall Kirk, Clemson University, Blackville, SC (Kendall R. Kirk, Michael T. Plumblee, John D. Mueller, Jeremy K. Greene, Benjamin B. Fogle, Brennan E. Teddy) 1901764

5:00pm  Intra-Row Weeding—Approaches for Elimination of Weeds between the Crop Plants  •  Presenting author: Peter Schulze Lammers, University of Bonn, North Rhien Westfalia Germany (Peter Schulze Lammers, Oliver Schmittmann, Matthias Müter) 1900532

238 Advances in Ecosystem Evapotranspiration Research—HYBRID
Tuesday, July 9, 2:30pm-5:00pm
Location: Vineyard
Sponsored by: NRES-23; NRES-25
Moderators: Devendra Amatya, USDA Forest Service, Cordesville, SC; Suat Irmak, University of Nebraska-Lincoln, Lincoln, NE

2:35pm  Modeling Urban Forest Evapotranspiration and Heat Island Mitigation with a Coupled Water and Energy Balance  •  Presenting author: Ted Endreny, State University of New York, Syracuse, NY (Ted Endreny, Yang Yang, Dave Nowak) 1901914

NO-SHOW  Evaluation of the Penman-Monteith and Other 34 Reference Evapotranspiration Equations under Limited Data in a Semiarid Dry Climate  •  Presenting author: Koffi Djaman, New Mexico State University, Farmington, NM (Michael O’Neill, Lamine Diop, Ansoumana Bodian, Samuel Allen, Komlan Koudahe, Kevin Lombard) 1900113

3:20pm  Drought Stress Effect on Observed Surface Energy Balance Closure  •  Presenting author: Jason Kelley, University of Idaho, Moscow, ID (Jason Kelley) 1901691

3:35pm  BREAK

3:45pm  Dynamics of Sensible Heat in a Semi-Arid Environment  •  Presenting author: Jerry E. Moorhead, USDA-ARS Conservation and Production Research Laboratory, Bushland, TX (Jerry E. Moorhead, Gary W. Marek, Prasanna H. Gowda, Thomas H. Marek) 1901903

4:00pm  Evaluating and Improving Model Behavior of Evapotranspiration: Dual Crop Coefficient in DSSAT  •  Presenting author: Kendall DeJonge, USDA-ARS, Fort Collins, CO (Kendall DeJonge, Kelly Thorp) 1901890

4:15pm  C3 and C4 Row Crop Transpiration and Evapotranspiration in Response to Environmental and Morphological Factors  •  Presenting author: Meetpal Kukal, University of Nebraska-Lincoln, Lincoln, NE (Suat Irmak) 1900866

4:30pm  Interactions of Sub-seasonal Water and Light Use Efficiencies in C3 and C4 Crops Managed Under Optimal Growth Conditions  •  Presenting author: Meetpal Kukal, University of Nebraska-Lincoln, Lincoln, NE (Suat Irmak) 1900865

4:45pm  Applying Stable Isotopes to Determine Seasonal Variability in Evapotranspiration Partitioning of Winter Wheat for Optimizing Agricultural Management Practices  •  Presenting author: Ying Ma, Institute of Geographic Science and Natural Resources Research, Chinese Academy of Sciences (CAS), Beijing, China (Xianfang Song) 1900056

5:00pm  Advances in the Use of Remotely Sensed Data to Estimate Evapotranspiration for Water Use Mapping and Water Budget Studies in Diverse Ecosystems  •  Presenting author: Gabriel Senay, US Geological Survey EROS Center, Fort Collins, CO (Gabriel Senay) 1901913

239 Advances in Irrigation Management
Tuesday, July 9, 2:30pm-5:00pm
Location: Clarendon
Sponsored by: NRES-24; NRES-244
Moderators: Andre Daccache, UC Davis, Davis, CA; Behnaz Molaei, Washington State University, Prosser, WA

2:35pm  Estimating Sensible Heat Flux from Camellia sinensis Using the Surface Renewal Method  •  Presenting author: Noman Ali Buttar, Jiangsu University, Zhenjiang China (Noman Ali Buttar, Yongguang Hu, Imran Ali Lakhari, Ahmed Azeem, Muhammad Zaman, Muhammad Awaiz) 1901370
2:50pm  Model-Based Optimal Crop Selection and Water Allocation  • Presenting author: Raphael Linker, Technion, Haifa Israel (Raphael Linker) 1900511

3:05pm  Comparison of Lysimeter-Derived Crop Coefficients for Legacy and Drought Tolerant Maize Cultivars  • Presenting author: Gary Marek, USDA-ARS, Bushland, TX (Thomas Marek, Steve Evett, Paul Colaizzi, Terry Howell, David Brauer) 1901816

3:20pm  Crop Evapotranspiration Coefficients for Drip-Irrigated Cotton Using FAO-56 Methods  • Presenting author: Doug Hunsaker, USDA-ARS, Maricopa, AZ (Douglas Hunsaker, Kevin F. Bronson) 1901840

3:35pm  BREAK

3:45pm  A Survey of Evapotranspiration Networks in the US  • Presenting author: Charles Swanson, Texas A&M Agrilife Extension Service, College Station, TX (Guy Fipps) 1901511

4:00pm  Evaluation of an Improved SWAT Auto-Irrigation Algorithm in the U.S. Southern Great Plains  • Presenting author: Yong Chen, Texas A&M AgriLife Research, Amarillo, TX (Gary Marek, Thomas Marek, David Brauer, Raghavan Srinivasan) 1900559

4:15pm  Development of an Advanced Cyber Infrastructure for Sustainable Water Management in Agriculture  • Presenting author: Jae Sung Kim, University of California, Davis, Davis, CA (Jae Sung Kim, Isaya Kisekka, Prasanna Gowda) 1900357

4:30pm  Utilizing IRT and Two Source Energy Balance Model for Irrigation Scheduling of Dry Edible Beans in Western Nebraska: Part 1. Experiment  • Presenting author: Isabella Presotto Possignolo, University of Nebraska-Lincoln, Lincoln, NE (Isabella Presotto Possignolo, Xin Qiao, Wei-zhen Liang) 1901289

4:45pm  Utilizing IRT and Two Source Energy Balance Model for Irrigation Scheduling of Dry Edible Beans in Western Nebraska: Part 2. Modeling  • Presenting author: Wei-zhen Liang, University of Nebraska-Panhandle Research and Education Center, Scottsbluff, NE (Xin Qiao, Isabella Possignolo) 1901294

5:00pm  Irrigation Water Fluxes in an Agricultural Watershed in Central Oklahoma  • Presenting author: Sumon Datta, Oklahoma State University, Stillwater, OK (Saleh Taghvaian, Mukesh Mehata, Daniel Moriasi) 1910245

240 Benefits and Challenges of Microirrigation
Tuesday, July 9, 2:30pm-5:00pm
Location: Berkeley
Sponsored by: NRES-24; NRES 245
Moderators: Freddie Lam, Kansas State University
Rothwest Res Ext Center, Colby, KS; Hemendra Kumar, Auburn University, Auburn, AL

2:35pm  Effects of Furrow Depth on Soil Hydrothermal Properties and Corn Germination with Alternate Row/Bed Planting under Subsurface Drip Irrigation  • Presenting author: Yan Mo, China Institute of Water Resources and Hydropower Research, Beijing, China (Yan Mo, Ronglian Wang, Shangqian Guo, Zhongdong Wu, Jiandong Wang, Yanqun Zhang, Guangyong Li, Dan Wang, Xiaoyan Gao) 1900699

2:50pm  Technique Characterization and Hydraulic Performance of Perforated Hose Microirrigation System for Sugarcane in Colombia  • Presenting author: Christian J. Mendoza, Cenicana, San Antonio, Valle del Cauca Colombia (Christian Mendoza, Javier Carbonell, Jhon Lasso) 1900792

3:05pm  Viability of Sub-Surface Drip Irrigation in Sugar Beets Production  • Presenting author: Aliashgar Montazar, University of California Division of Agriculture and Natural Resources- UCCE Imperial, Holtville, CA (Steve Kaffka, Khaled Bali, Oli Bachie) 1900809

3:20pm  Effects of Drip System Uniformity on Salt Dynamics and Cotton Yield in the Arid Region of Southern Xinjiang, China  • Presenting author: Jun Wang, China Institute of Water Resources and Hydropower Research, Beijing, China (Xiaomin Lin, Zhen Wang, Jiusheng Li, Yanfeng Li, Jun Wang) 1901109

3:35pm  BREAK

3:45pm  Field Evaluation of Drip Irrigation and Fertigation Performance as Affected by Lateral Layout of Subunits  • Presenting author: Zhihao Zhang (Zhihao Zhang, Zhen Wang, Yanfeng Li, Jiusheng Li) 1900966

4:00pm  Effects of Phosphorus Fertigation on the Olsen-P Content in Soil and Yield of Maize under Drip Irrigation with Secondary Sewage Effluent  • Presenting author: Weixia Zhao, China Institute of Water Resources and Hydropower Research, Beijing, China (Zhen Wang, Jiusheng Li, Fengzhen Hao, Yanfeng Li, Weixia Zhao) 1901097

4:15pm  Coupling Effects of Water and Nitrogen on Cotton Growth and Yield under Mulched Drip Irrigation with Different Qualities of Water in the Arid Region  • Presenting author: Jiusheng Li, China Institute of Water Resources and Hydropower Research, Beijing, China (Zheng Che, Jun Wang, Jiusheng Li, Yanfeng Li) 1900945

4:30pm  Soybean Response to Subsurface Drip Irrigation in West Central Nebraska  • Presenting author: Hope Njuki Nakabuye, University of Nebraska-Lincoln, North Platte, NE (Tsz Him Lo, Daran Rudnick) 1901300

4:45pm  A Real-Time Irrigation Scheduling App for Drip-Irrigated Greenhouse Tomatoes Using Dual Crop Coefficient Method  • Presenting author: Zhe Gu, Hohai University, Nanjing, Jiangsu Province China (Xiyun Jiao, Junzeng Xu, Weihua Guo, Qi Wei) 190172

241 BMPs and Water Quality: Measurements
Tuesday, July 9, 2:30pm-5:00pm
Location: Arlington
Sponsored by: NRES-22; NRES-21; NRES-225; NRES-23; NRES-25; NRES-26; NRES-28
Moderators: Prem Parajuli, Mississippi State University, Starkville, MS; Kira Hansen, University of Florida, Immokalee, FL

2:35pm  Efficacy of a Linear Wetland to Treat Agricultural Drainage in the Little River Watershed  • Presenting author: Brock Kamrath, North Carolina State University, Raleigh, NC (Michael Burchell) 1900877
Tuesday, July 9

2:50pm  Denitrification Bioreactors as a Structural Water Quality BMP at Watershed Scale: Performance and Lessons  
Presenting author: Gary Feyereisen, USDA-ARS, St. Paul, MN (Gary W. Feyereisen, Ehsan Ghane, Mark Dittrich) 1900658

3:05pm  Hydrologic and Water Quality Benefits of Compact Bed Design for Fresh Produce  
Presenting author: Rajendra Sishodia, University of Florida, Gainesville, FL (Rajendra P Sishodia, Kira Hansen, Sanjay Shukla, Nathan Holt) 1901638

3:20pm  Nutrient Export from Paired Catchments with Varying BMPs Implementation  
Presenting author: Ji Yeow Law, Iowa State University, Ames, IA (Ji Yeow Law, Michelle Soupir, Leigh Ann Long) 1900593

3:35pm  BREAK

3:45pm  Estimation Framework for Urbanized Watershed Using a Bayesian Uncertainty  
Presenting author: Reid Christianson, University of Illinois, Urbana, IL (Reid Christianson) 1901197

3:45pm  Forming Public-Private Partnerships to Identify and Manage Agricultural Fields with Elevated Phosphorus in the Western Lake Erie Basin  
Presenting author: Michael Brooker, The Ohio State University, Columbus, OH (Margaret Kalcic, Greg LaBarge, Robyn Wilson, Brian Roe, Ryan Winston, Jessica D’Ambrosio, Kevin King, Nathan Stoltzfus, Jay Martin) 1901150

4:00pm  Metal Loss in Surface Runoff from Surface-Broadcast and Subsurface-Banded Broiler Litter  
Presenting author: Jasmeet Lamba, Auburn University, Auburn, AL (Jasmeet Lamba, Puneet Nathan Stoltzfus, Jay Martin) 1900324

4:15pm  Monitoring Progress of Conservation Implementation  
Presenting author: Reid Christianson, University of Illinois, Urbana, IL (Reid Christianson) 1901197

4:30pm  Converting Dry Detention Basins to Constructed Stormwater Wetlands for Enhanced Pollutant Removal  
Presenting author: Sarah Waickowski, NC State University, Raleigh, NC (Katy Mazer, William Hunt) 1900324

4:45pm  Removal of Swine Slurry Constituents in Runoff Through Setback Distance  
Presenting author: John Gilley, USDA-ARS, Lincoln, NE (John E. Gilley, Shannon Bartelt-Hunt, Kent Eskridge, Xu Li, Amy Schmidt, Daniel Snow) 1900008

5:00pm  Wetting and Drying Cycles Effects on Aqueous and Gaseous Nutrient Removal and Emissions in Woodchip Bioreactors  
Presenting author: Francois Birgand, NC State University, Raleigh, NC (Francois Birgand, B. M. Maxwell, D. J. Williams, L. A. Schipper, L. E. Christianson, S. Tian, M. J. Helmers, G. M. Chescheri, M. A. Youssef) 1901757

5:15pm  Fingerprinting the Sources of Stream Bed Sediment in an Urbanized Watershed Using a Bayesian Uncertainty Estimation Framework  
Presenting author: Kritika Malhotra, Auburn University, Auburn, AL (Kritika Malhotra, Ash Abebe, Jasmeet Lamba) 1900673

242 Erosion and Water Quality in Urban Streams and Wetlands  
Tuesday, July 9, 2:30pm-5:00pm
Location: Provincetown
Sponsored by: NRES-25; NRES 252; NRES-28
Moderators: Phuc Vu, USDA NRCS, Forth Worth, TX; Carolyn Jones, USDA NRCS, Vacaville, CA

3:35pm  Sources of Stream Bed and Suspended Sediment in an Urbanized Watershed  
Presenting author: Jasmeet Lamba, Auburn University, Auburn, AL (Kritika Malhotra, Jasmeet Lamba, Stephanie Shepherd) 1901637

3:50pm  Using Stream Restoration to Improve Hydrology and Water Quality in an Urban Watershed  
Presenting author: Carmen Agouridis, University of Kentucky, Lexington, KY (Samuel Austen, William Ford, Christopher Barton) 1901218

3:05pm  Comparison of Methods for Assessing Stream Bank Erosion and Failure in Stream Restoration: A Case Study in the North Carolina Piedmont Region  
Presenting author: Kayla Kassa, North Carolina State University, Raleigh, NC (Celso Castro-Bolinaga, Lucie Guertault, Garey Fox, Periann Russell) 1900358

3:20pm  Quantification of Erosional and Depositional Processes near Implemented Streambank Stabilization Practices  
Presenting author: Matt Russell, University of Nebraska-Lincoln, Lincoln, NE (Matthew Russell, Tiffany Messer) 1900162

3:35pm  BREAK

3:45pm  Stream Rehabilitation and Sedimentation Modeling  
Presenting author: Jessica Calhoun, Auburn University, Auburn, AL (Frances O’Donnell, Preston Waid, Alex James, Eve Brantley) 1901625

4:00pm  The Short-term Response of Nutrient Loads to an Agricultural Stream Restoration in Coastal Plain of North Carolina  
Presenting author: Qianyu Han, NC State University, Raleigh, NC (Qianyu Han, Francois Birgand, Cyrus Belenky, Chiao-wen Lin) 1900954

4:15pm  The Role of Human-Managed Freshwater Discharges in Florida’s Ongoing Harmful Algal Bloom Crises  
Presenting author: Natalie Nelson, North Carolina State University, Raleigh, NC (Edward Philips, Eric Milbrandt) 1901196

4:30pm  Appraising Instream Wetland Nitrate-N Abatement at a Watershed Scale Using SWAT  
Presenting author: Clement Sohoulande, USDA-ARS Coastal Plains Soil Water and Plant Research Center, Florence, SC (Ariel Szogi, Kenneth Stone) 1901901

4:45pm  Systematic Review of Ochlockonee River Basin Fauna  
Presenting author: Janeesa Pagan, Florida A&M University, Tallahassee, FL (Auvudai Anandhi) 1901780

5:00pm  Heat Storage Induced by Salinity Stratification in Tropical Saline Aquaculture Ponds  
Presenting author: Akinori Ozaki, Institute of Tropical Agriculture, Kyushu University, Fukuoka Japan (Akinori Ozaki, Panitan Kaewjantawee, Monton Anongponyoskul, Nguyen Van Thinh, Masaru Matsumoto, Masayoshi Harada, Kunihiko Hamagami, Takashi Okayasu) 1901005

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
243 Grand Challenges Session—Pesticides in Freshwater Systems: Effects and Mitigation—INVITED
Tuesday, July 9, 2:30pm-5:00pm
Location: Salon J
Sponsored by: NRES-21; NRES-253
Moderators: Rafael Munoz-Carpena, University of Florida, Gainesville, FL; Garey Fox, North Carolina State University, Raleigh, NC

2:30pm Towards Sustainable Environmental Quality: Priority Research Questions in Environmental Toxicology and Chemistry • Presenting author: Byran W. Brooks, Ph.D., Distinguished Professor, Department of Environmental Science, Institute of Biomedical Studies, Baylor University, Waco, TX (Bryan W. Brooks) 1901938


3:30pm BREAK

3:40pm Tipping into the Future of Pesticides Risk Assessment: Where Landscape-Scale Data and Mechanistically Driven Chemical Risk Assessment Meet • Presenting author: Tilghman Hall, PhD, Director, Environmental Toxicology and Risk Assessment, Regulatory Science North America, Bayer CropScience LP, Raleigh, NC 1901935

4:00pm Groundwater and Pesticides: Perspective and Challenges • Presenting author: Chittaranjan Ray, Ph. D., P.E., Director, Nebraska Water Center, University of Nebraska, Lincoln, NE (Chittaranjan Ray) 1901934

4:20pm Incorporating the Benefits of Vegetative Filter Strips and Riparian Buffers into Risk Management and Assessment of Pesticides • Presenting author: Rafael Munoz-Carpena, University of Florida, Gainesville, FL (Rafael Muñoz-Carpena, Garey Fox) 1901933

244 Managing Manure and Agricultural Byproducts for Sustainability
Tuesday, July 9, 2:30pm-5:00pm
Location: Nantucket
Sponsored by: NRES-27
Moderators: Shafiqur Rahman, North Dakota State University, Fargo, NE; Jeffrey Kast, Ohio State University, Columbus, OH

2:35pm Modeling Phosphorus Delivery Rates: Manure vs. Inorganic Fertilizer • Presenting author: Jeffrey Kast, The Ohio State University, Columbus, OH (Jay Martin, Margaret Kalic, Anna Apostel, Grey Evenson, Rebecca Muenich, Awoke Dagnew, Colleen Long) 1901111

2:50pm Determining Modeling Parameters for Sludge Transport and Dispersion • Presenting author: Jacqueline Welles, North Carolina State University, Raleigh, NC (John Classen, Mark Rice, Celso Castro-Bolinaga, Mahmoud Sherara) 1901397

3:05pm Optimal Planning and Operation of Swine Farm Manure Management: Modeling and Simulation • Presenting author: Jiangong Li, University of Illinois, Urbana-Champaign, Urbana, IL (Jiangong Li, Kailiyang Wang, Xinlei Wang) 1900349

3:20pm Nutrient Loss from Manure Staging Areas • Presenting author: Rhonda Miller, Utah State University, Logan, UT (Jenny Long) 1901252

3:35pm BREAK

3:45pm Biochar Improves Poultry Mortality Composting Process • Presenting author: Yuchuan Wang, University of Illinois, Urbana, IL (Yuchuan Wang, Nesilhan Akdeniz) 1901222

4:00pm Holistic Management of Manure Application Systems: Vehicle, Tool & Soil • Presenting author: Erica Timmermans, Iowa State University, Ames, IA (Daniel Andersen) 1901705

4:15pm Antimicrobial Resistance in Beef Feedlot Manure as Impacted by Forage Concentration and Essential Oil in Finishing Cattle Diets • Presenting author: Mara Zelt, University of Nebraska-Lincoln, Lincoln, NE (Mara Zelt, Amy Millmier-Schmidt, Noelle Antieno-Mware, Xu Li, Zach Staley, Hannah Wilson, Galen Erickson) 1900232

4:30pm Challenges and Opportunities in Swine Lagoon Sludge Management • Presenting author: Mahmoud Sharara, North Carolina State University, Raleigh, NC (Mahmoud Sharara, John M Rice) 1900488
Tuesday, July 9

4:45pm  A Quantitate Understanding of the ROE of Co-Composted Biochar in Plant Growth Using Meta-Analysis  • Presenting author: Yuchuan Wang, University of Illinois, Urbana, IL (Yuchuan Wang, Neslihan Aldeniz) 1901219

5:00pm  Evaluation of the Impact of Cover Crop and Manure Application Timing on Nitrogen Loss in the Midwestern US  • Presenting author: Alyvia Steenhoek, Iowa State University, Ames, IA (Daniel Andersen) 1901749

5:15pm  Bioavailable Phosphorus Attainment in Hydrochar Produced from Dairy Manure  • Presenting author: Bingjun He, University of Idaho, Moscow, ID (Chad Dunkel, Lide Chen, Kevin Kruger) 1900024

245 Real-Time Systems to Manage Natural Resources and Environmental Systems
Tuesday, July 9, 2:30pm-5:00pm
Location: Orleans
Sponsored by: NRES-21; NRES-28; ITSC-353
Moderators: Debabrata Sahoo, Woolpert Inc., West Columbia, SC; Kyle Cheung, University of California, Davis, CA


2:50pm  Model-Predictive Real-Time Fertilization/Irrigation Decision-Making Using RZWQM  • Presenting author: Anupam Bhar, Iowa State University, Ames, IA (Anupam Bhar, Ratnesh Kumar) 1901395

3:05pm  Collaborating with Ag Producers to Leverage On-Farm Weather Data  • Presenting author: Jason Kelley, University of Idaho, Moscow, ID (Jason Kelley) 1901692

3:20pm  A Novel Fiber-Optic Dual-Probe Heat Pulse Technique to Measure Soil Thermal Properties and Moisture Content over a Wide Range of Spatial Scales  • Presenting author: Mahmoud Shehata, North Carolina State University, Raleigh, NC (Mahmoud Shehata, Joshua Heitman, Joseph Ishak, Chadi Sayde) 1900633

3:35pm  BREAK

3:45pm  Soil Structure and Soil Texture Effects on Soil Water Content Measurements by a Capacitance Based Electromagnetic Sensor  • Presenting author: Jasreman Singh, University of Nebraska-Lincoln, Lincoln, NE (Jasreman Singh, Derek Heeren, Yufeng Ge, John Barker, Wayne Woldt, Christopher Neale, Geng Bai, Daran Rudnick, Joe Luck, George Meyer) 1901007

4:00pm  Development of Monthly Streamflow and Groundwater Level Forecasts in Semi-arid Basins  • Presenting author: Tushar Sinha, Texas A&M University-Kingsville, Kingsville, TX (Tushar Sinha) 1901594

4:15pm  Mapping and Predictive Analytics of Groundwater Resilience Using Machine Learning: The Integration of Policies and UNCERTAINTIES in a Decision Support Tool  • Presenting author: Francisco Munoz-Arriola, University of Nebraska-Lincoln, Lincoln, NE (Francisco Munoz-Arriola, Alessandro Amaranto, Joel Cantu-Guerrero, Gerald Corzo-Perez, Dimitri Solomatine) 1901654

4:30pm  Efficacy of Passive Capillary Lysimeters for Estimating Real-Time Drainage Water Fluxes  • Presenting author: Jay Jabro, NPARL, Sidney, MT (Bart Stevens, Bill Iversen) 1900114

246 Waterborne Pathogens and Emerging Contaminants
Tuesday, July 9, 2:30pm-5:00pm
Location: Falmouth
Sponsored by: NRES-28; NRES-21; NRES-22; NRES-224
Moderators: Tiffany Messer, University of Nebraska, Lincoln, NE; Christine Georgakakos, Cornell University, Homer, NY

2:35pm  Closing the Gap: Remaining Challenges in the Provision of Water and Wastewater Services in Rural American Communities  • Presenting author: Leigh-Anne Krometis, Virginia Tech, Blacksburg, VA (Leigh-Anne Krometis) 1900835

2:50pm  Sample Preparation Techniques for Onsite Detection of Environmental Water-Borne Pathogens by Loop-Mediated Isothermal Amplification  • Presenting author: Lena Diaz, University of Hawaii, Honolulu, HI (Daniel Jenkins) 1901579

3:05pm  Potential of Denitrifying Bioreactors to Manage Phytophthora Species in Agricultural Runoff and Drainage  • Presenting author: Natasha Bell, Clemson University, Clemson, SC (Daniel R. Hitchcock, Steven N. Jeffers, Sarah A. White) 1900538

3:20pm  Fate and Transport of Microplastics Following Biosolid Application in Agricultural Field  • Presenting author: Brittany Trejo, University of Nebraska-Lincoln, Lincoln, NE (Nasrin Naderi Beni, Shannon Bartelt-Hunt, Tiffany Messer) 1900454

3:35pm  BREAK

3:45pm  Simulating the Fate and Transport of Contaminants of Emerging Concern in Agricultural Watersheds with the Soil and Water Assessment Tool  • Presenting author: Lidiia liorakska, The Pennsylvania State University, University Park, PA (Lidiia liorakska, Heather E. Gall, Tamie L. Veith, John E. Watson) 1901653

4:00pm  Monitoring Emerging Contaminants in Wastewater-Impacted Vernal Pools Using Integrative and Grab Sampling Techniques  • Presenting author: Kathryn Hayden, Penn State, State College, PA (Kathryn R. Hayden, Heather E. Gall, Laura B. Saleh, Herschel A. Elliott, John E. Watson) 1900850

4:15pm  Seasonal Variations of Emerging Organic Contaminants (EOCs) in Drinking Water Sources in the Susquehanna River Basin  • Presenting author: Heather E. Gall, Penn State University, University Park, PA (Faith A. Kibuye, Heather E. Gall, Tamie L. Veith, Kyle R. Elkin, Lidiia liorakska, Jamie Weikel) 1901742

4:30pm  Catchment-Scale Export of Antibiotic Resistance Genes and Bacteria from an Agricultural Watershed in Central Iowa  • Presenting author: Timothy Neher, Iowa State University, Ames, IA (Michelle Soupir, Adina Howe, Thomas Moorman) 1900156

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Tuesday, July 9

4:45pm **Hydraulic Flume Studies to Evaluate the Mitigation of Antimicrobial Resistance from Manure-Amended Crop Fields by Prairie Buffer Strips**  
Presenting author: Andrew J. Craig, Iowa State University ABE, Ames, IA (Andrew J. Craig, Michelle L. Soupir, Chris Rehmman, Adina Howe, Laura Alt) 1900216

5:00pm **Prevalence and Degradation of Antibiotic Resistance Genes in Dairy Manure**  
Presenting author: Yi Wang, UC Davis, Davis, CA (Pramod Pandey) 1900851

247 Animal Response to Environment  
Tuesday, July 9, 2:30pm-5:00pm  
Location: Yarmouth  
Sponsored by: PAFS-40; ITSC-312  
Moderator: Yang Zhao, Mississippi State University, Mississippi State, MS

2:35pm **Modeling Lactating Cow Respiration Rates during Heat Stress Based on Dry-Bulb and Dew-Point Temperatures, Daily Milk Production and Air Velocity**  
Presenting author: Kevin Janni, University of Minnesota, St. Paul, MN (Kevin Janni) 1900297

2:50pm **Thermal Environmental Stress of Broilers during Transportation Affected by Climate Condition**  
Presenting author: Hong Li, University of Delaware, Newark, DE (Peyton Szymborski, Kentucky, Lexington, KY (Staci McGill, Morgan Hayes, Claire Burnham)

3:05pm **Responses of Broiler Live Performance, Welfare Parameters and Litter Characteristics to Air Velocity Treatments Under Hot Summer Condition**  
Presenting author: Derek West, North Carolina State University, Raleigh, NC (Bin Cheng, Suraiya Akter, John Classen, Lingjuan Wang-Li, Hernan Cordova, Viviana San Martin Diaz, Edgar Oviedo) 1901767

3:20pm **Behavioral Responses of Heavy Broilers to Air Velocity Treatments Under Hot Summer Condition**  
Presenting author: Yingying Liu, North Carolina State University, Raleigh, NC (Yingying Liu, Bin Cheng, Derek West, Suraiya Akter, John Classen, Lingjuan Wang-Li, Hernan Cordova, Viviana San Martin Diaz, Edgar Oviedo) 1900570

3:35pm **BREAK**

3:45pm **Heat and Moisture Production of Heavy Broilers Under Hot Summer Condition**  
Presenting author: Suraiya Akter, North Carolina State University, Raleigh, NC (Yan Qian, Bin Cheng, Derek West, John Classen, Lingjuan Wang-Li, Hernan Cordova, Viviana San Martin Diaz, Edgar Oviedo) 1900590

4:00pm **Empirical and Analytical Analysis of Heat Flux in Conductive Cooling Systems for Dairy Cattle**  
Presenting author: Kristen Perano, Cornell University, Ithaca, NY (Kifle Gebremedhin) 1901668

4:15pm **Air Speed to Increase Rate of Cool Out for Horses After Intense Exercise**  
Presenting author: Staci McGill, University of Kentucky, Lexington, KY (Staci McGill, Morgan Hayes, Claire Burnham) 1901862

4:30pm **Laying Hen Responses to High Ammonia Concentrations for Short Durations**  
Presenting author: Angela Green-Miller, University of Illinois, Urbana, IL (Christina Tucker, Angela Green-Miller, San Myint, Shih-Hsuan Hsiao, David Coleman, Yvette Johnson-Walker) 1901404

4:45pm **Acceptability and Economic Viability of Shades from Photovoltaic Panels to Wool Sheep**  
Presenting author: Alex Sandro Maia, Sao Paulo State University, Jaboticabal, SP Brazil (Eric Culharia, Vinicius Fonsêcaa, Hugo Milan) 1901533

5:00pm **Effects of Controlling Ammonia Concentration on Broiler Production Performances, Energy Consumption, and Emission**  
Presenting author: Hong Li, University of Delaware, Newark, DE (Hong Li, Joshua Payne) 1901790

5:15pm **Review of Methods to Mitigate Heat Stress Among Sows**  
Presenting author: Bjarne Bjerg, University of Copenhagen, Denmark (Bjarne Bjerg, Pia Brandt, Kasper Sørensen, Poul Pedersen, Guoqiang Zhang) 1900741

248 Measurement, Mitigation and Modeling of Air Pollution from Livestock and Poultry Facilities  
Tuesday, July 9, 2:30pm-5:00pm  
Location: Hyannis  
Sponsored by: PAFS-50  
Moderator: Jactone Ogejo, Virginia Tech, Blacksburg, VA

2:35pm **Empirical Model of Annual Nitrous Oxide Emissions from Open-Lot Beef Cattle Feedyard Pens (Version 2)**  
Presenting author: David B. Parker, USDA-ARS, Bushland, TX (David Parker, Kenneth Casey, Erin Cortus, Heidi Waldrip, Byeng Min, Bryan Woodbury, Mindy Spiels) 1900299

2:50pm **A Farm-Scale, Quasi Mechanistic Model for Estimation of NH3 Emission from Commercial Manure-Belt Layer Facilities**  
Presenting author: Lingying Zhao, The Ohio State University, Columbus, OH (Xinjie Tong, Lingying Zhao, Albert Heber, Ji-Qin Ni) 1901330

3:05pm **Laboratory Evaluation and Optimization of an Electrostatic Spray Scrubber for PM Mitigation in Poultry Facilities**  
Presenting author: Reyna M. Knight, The Ohio State University, Columbus, OH (Reyna M. Knight, Jeb Hocter, Lingying Zhao) 1900543

3:20pm **A Dispersion-Based Tool for Assessing Odor Impact of Hog Operations**  
Presenting author: Amy La, Department of Biosystems Engineering, University of Manitoba, Winnipeg, Manitoba, Canada (Amy La, Qiang Zhang, Zhu Gao, Huiqing Guo) 1900348

3:35pm **BREAK**

3:45pm **Modeling Dispersion and Deposition of Ammonia Emission from Large Layer Facilities Using AERMOD**  
Presenting author: Lingying Zhao, The Ohio State University, Columbus, OH (Xinjie Tong, Lingying Zhao, Gil Bohrer) 1901141

4:00pm **Improved Ammonia Emission Inventory for Poultry and Swine Production in North Carolina**  
Presenting author: Wang-Li, Lingjuan, North Carolina State University, Raleigh, NC (Yijia Zhao, Lingjuan Wang-Li, Sanjay Shah, Nicholas Meskhidze, Joe Guinness) 1900572

4:15pm **Laboratory Evaluation and Optimization of an Electrostatic Precipitator for PM Mitigation in Poultry Facilities**  
Presenting author: Reyna M. Knight, The Ohio State University, Columbus, OH (Reyna M. Knight, Jeb Hocter, Lingying Zhao) 1900542
Tuesday, July 9

4:30pm  Modeling Droplets Charging of Ring-Electrodes with Different Dimensions and Materials  •  Presenting author: Xiaochuan Li, China University of Mining & Technology, Xuzhou, Jiangsu, China (Xiaochuan Li, Reyna Knight, Lingying Zhao) 1901380

4:45pm  Influence of a Windbreak Wall on Particulate Matter and Bioaerosols Concentrations Emitted from a Layer-House  •  Presenting author: Ailun Wang, Zhejiang University, Hangzhou, Zhejiang, China (Ailun Wang, Xiaoshuai Wang, Lingjuan Wang-Li, Kaiying Wang) 1900473

5:00pm  Porous Windbreak Wall-Vegetative Strip System to Reduce PM Emissions from Mechanically-Ventilated Swine and Poultry Barns  •  Presenting author: Sanjay B. Shah, North Carolina State University, Raleigh, NC (Lingjuan Wang-Li, Sanjay B. Shah) 1901256

249 PRS—Processing Systems POSTER SESSION

Tuesday, July 9, 2:30pm-5:00pm

Posters will be displayed for the entire session, but authors will be present at posters as follows:

2:30pm-3:45pm, authors with ODD numbered posters present

3:45pm-5:00pm, authors with EVEN numbered posters present

Location: Gloucester
Sponsored by: PRS
Moderator: Lamin Kassama, Alabama A&M University, Normal, AL

61  Physicochemical Properties and Biocompatibility of Polycaprolactone Filaments with Naturally Derived Hydroxyapatite for 3D Printing  •  Presenting author: Jong Hoon Chung, Seoul National University, Seoul South Korea (Kyong-Je Kang, Sangbae Park, Myung Chul Lee, Jae woon Lim, Jae Eun Kim, Hong Bae Kim, Bog Hee Kim, Se woong Jung, Jong Hoon Chung) 1900666

62  Development of Non-viral Gene Carrier Using Polyethyleneimine and Equine Bones as Livestock By-Product  •  Presenting author: Jong Hoon Chung, Seoul National University, Seoul South Korea (Myungchul Lee, Kyong-Je Jang, Sangbae Park, Jaewoon Lim, Hong Bae Kim, Hyunmok Son, Jae Eun Kim, Jong Hoon Chung) 1900987

63  Monitoring the Microwave-Assisted Fluidized Bed Drying of Green Peas Using Computer Vision  •  Presenting author: Anthony Theonye, Department of Bioresource Engineering, McGill University, Ste-Anne-de-Bellevue, Quebec, Canada (Yvan Garipey, Vijaya Raghavan) 1901627

64  Effect of Various Drying Methods on the Quality and Germination Potential of Soybean Seeds  •  Presenting author: Ayushi Anand, McGill University, Montreal, Quebec Canada (Ayushi Anand, Yvan Garipey, GSV Raghavan) 1901820

65  Techno-Economic Analysis of Modified Dry Milling of Colored Corn  •  Presenting author: Deepak Kumar, University of Illinois, Urbana, IL (Deepak Kumar, Vijay Singh) 1900920

67  Differences in Gelatination Properties Among Corn Starch, Corn Meal and Formula Feed for Finishing Pigs with Rapid Visco Analyzer  •  Presenting author: Hongying Wang, China Agricultural University, Beijing, China (Na Jin, Hongying Wang, Peng Fang, Juan Ma, Enze Duan, Jiuyan Chen, Chuken Chang) 1900492

68  A High-Throughput Platform for Screening and Testing Bactericides Targeting Candidatus Liberiibacter asiaticus for Huanglongbing (HLB) Management  •  Presenting author: Haoqi Wang, Texas A&M University, College Station, TX (Haoqi Wang, Kranthi Kiran Mandadi, Sandun Fernando) 1900140

69  A Non-Beta-Lactam Antibiotic Inhibitor for Enterohemorrhagic Escherichia coli O104:H4  •  Presenting author: Haoqi Wang, Texas A&M University, College Station, TX (Haoqi Wang, Arul Jayaraman, Rani Menon, Varun Gejji, Raghupathy Karthikeyan, Sandun Fernando) 1900141

70  Comparative Study of Lycopene Encapsulation Efficiency in Polycaprolactone vs. Polylactic Co-Glycolic Acid  •  Presenting author: Lamin S. Kassama, Alabama A&M University, Normal, AL (Mohammad Anwar Ul Alam, Lamin Kassama) 1901707

71  The Antioxidant Potentials of Enzymatically Hydrolyzed Canned Red Kidney Beans (Phaseolus vulgaris L.) in the In Vitro Simulated Gastrointestinal Tract  •  Presenting author: Lamin S. Kassama, Alabama A&M University, Normal, AL (Ogechukwu Tasie, Judith Boteng, Irenus Tazisong, Lamin Kassama) 1901721

72  Hydrolysis and Fermentation of Corn Fiber for Succinic Acid Production  •  Presenting author: Lisbeth Vallecilla-Yepez, University of Nebraska, Lincoln, NE (Lisbeth Vallecia-Yepez, Dianna Long, Cheryl Immethun, Rajib Saha, Mark Wilkins) 1901855

74  Hydrothermal Carbonization of Anaerobic Digestion Effluent from Sewage Sludge  •  Presenting author: Luis Huezo, The Ohio State University, Wooster, OH (Luis Huezo, Juliana Vasco-Correa, Ajay Shah) 1901206

75  Process Optimization and Formulation of Chickpea-Based Milk Beverage  •  Presenting author: Neha Sharma, McGill University, Montreal Quebec Canada (Valerie Orsat) 1901651

76  The Impact of the Dairy Cow Diet on Anaerobic Digestion of Manure  •  Presenting author: Alessandro Chiumenti, University of Udine, Udine Italy (Francesco da Borso, Stefano Guercini, Andrea Pezzuolo, Sandy Sgorlon, Gemini delle Vedove, Fabiano Miceli, Bruno Stefanon) 1900856

77  Physicochemical Properties of Pasta Derived from Extrusion of Durum Wheat and Cassava Flour  •  Presenting author: Akinbode A. Adedeji, University of Kentucky, Lexington, KY (Adetola O. A., Olalusi A. P., Adedeji A.A.) 1900659

78  Acid and Hydrothermal Modification of Different Types of Cassava (Manihot esculenta) Starch  •  Presenting author: Akinbode A. Adedeji, University of Kentucky, Lexington, KY (Adetola O. A., Olukunle, O. J., Adedeji A. A.) 1900660

79  A Study on the Numerical Simulations and Experimental Validation of a Hybrid Solar Dryer for Cocoa  •  Presenting author: Felix Akharume, University of Kentucky, Lexington, KY (Felix Akharume, Samuel Adeyemi, Surajudeen Obayopo) 1900890

80  A Study on the RF Thawing of Frozen Tuna to Prevent Uneven Thawing  •  Presenting author: Jinse Kim, RDA Korea, Jeonju,
Tuesday, July 9

78 NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.

81 Rapid Quantitative Detection of Sulfamethoxazole in Honey by Surface-Enhanced Raman Spectroscopy • Presenting author: Ya-Chao Liu, China Agriculture University, Beijing China (Yan Shuai, Li Yong-yu, Peng Yan-kun, Liu Ya-chao, Wang Qi) 1900643

82 A Nondestructive On-Line Detection System of Apple Internal and External Parameters Based on Optical Technique • Presenting author: Ya-Chao Liu, China Agriculture University, Beijing China (Long Li, Yankun Peng, Yongyu Li, Yachao Liu) 1900783

83 Evaporation-Driven Attachment and Infiltration of Bacteria into Artificial Plant Leaves Built by Microfabrication • Presenting author: Mohsen Ranjanbar, Cornell University, Ithaca, NY (Mohsen Ranjanbar, Ashim K. Datta) 1900382

84 Drying Kinetics and Quality Attributes of Apple Slices Dried with a Non-Thermal Ultrasonic Drying Method • Presenting author: Ozan Kahraman, University of Illinois at Urbana-Champaign (UIUC), Urbana, IL (Ozan Kahraman, Amir Malvandi, Hao Feng) 1901622

85 Manothesersonication for Recovery of Bioactive Compounds of Pomegranate Peels: Effects of Ultrasoundication, Temperature and Pressure on Extraction Rate • Presenting author: Ozan Kahraman, University of Illinois at Urbana-Champaign (UIUC), Urbana, IL (Nihal Guzel, Ozan Kahraman, Mosbah M. Kushad, Hao Feng) 1901620

86 Performance Comparison of the APSIM and CERES-Wheat Models in Guanzhong Plain, China • Presenting author: Qaisar Saddique, Northwest A&F University, Yangling, Shaanxi China (Qaisar Saddique, Jianmei Ji, Ali Ajaz, Xu Jiutou, Zou Yufeng, Jianqiang He, Guang-Fei Zhu, Huanjie Cai) 1900417

87 Development of Seed Single Granulation Device for Seeds’ Vitality Detection and Classification • Presenting author: Yankun Peng, China Agricultural University, Beijing China (Yali Wang, Yankun Peng, Xinlong Zhao) 1900787

88 Nondestructive Real-Time Assessment of sausage Quality Based on Visible-Near Infrared Spectrographic Technique • Presenting author: Yankun Peng, China Agricultural University, Beijing China (QiBin Zhuang, Yankun Peng, Qinghua Yang, Yongyu Li) 1900789

89 Twin Screw Extrusion Processing of Snacks Containing Soy Flour and Apple Pomace • Presenting author: Sushil K. Singh, Assistant Professor, Rourkela, Odisha, India (Poonam Singha, Sushil K. Singh, Kasiviswanathan Muthukumarapann) 1900482

90 Viscosity Modeling of Aquafeed Dough in a Single Screw Extruder • Presenting author: Sushil K. Singh, Assistant Professor, Rourkela, Odisha, India (Sushil K. Singh, Poonam Singha, Kasiviswanathan Muthukumarapann) 1901306

91 Effect of Extrusion Processing on Properties of Extrudates Containing Sorghum and Grape Pomace • Presenting author: Sushil K. Singh, Assistant Professor, Rourkela, Odisha, India (Sushil K. Singh, Poonam Singha, Madhuressh Dwivedi) 1901083

92 Effects of Different Drying Methods on the Product Quality and Drying Kinetics of Banana Slices • Presenting author: Guangfei Zhu, Beijing, China (Zhian Zheng, Dalong Jiang, Lei Gao, Guangfei Zhu, Yawen Lin) 1901118

93 Effect of Drying and High-Humidity Hot Air Impingement Blanching (HHAIB) Parameters on Drying Characteristics and Quality of Apple Slices • Presenting author: Guang-Fei Zhu, Beijing, China (Hui Wang, Hong-Wei Xiao, Zi-Liang Liu, Xian Long Yu, Guang-Fei Zhu, Zhan Zheng) 1900524

94 Enhancing the Safety of Goat Meat by Sonication against Escherichia coli • Presenting author: Ajit Mahapatra, Fort Valley State University, Fort Valley, GA (R. Arya, H. L. Degala, A. K. Mahapatra, G. Kannan) 1900163

95 Effect of Gelatin Concentration on Visco-Elastic Properties of Ice-Cream Produced by Liquid Nitrogen Immersion Technique • Presenting author: Awani Shrivastav, PhD Research Scholar, Kharagpur, West Bengal, India (Awani Shrivastav, T. K Goswami) 1900969

96 Effect of Seasonal Milk Compositional Variation on Coagulation Kinetics during Cheese Manufacture • Presenting author: Colm O’Donnell, University College Dublin, Dublin Ireland (Jiani Luo, Carlos Esquerre, Fred Payne, Colm O’Donnell) 1901724

97 Optical Time Parameter Measurement Precision for a Milk Coagulation Sensor • Presenting author: Fred Payne, University of Kentucky, Lexington, KY (Sam Mullins) 1901403

98 Properties and Finite Element Analysis of Corn Kernels under Uniaxial Compression Loads • Presenting author: Gao Xiaojun, China Agricultural University, Beijing China (SuYuan, Cui Tao, Xu Yang, Zhang Dongxing, Xia Guoyi, Gao Xiaojun, He Xiaowei) 1901372

99 Modeling the Feasibility of Existing Tolerance Levels for Non-GM corn • Presenting author: Gretchen Mosher, Iowa State University, Ames, IA (Chad J. Dolphin, Gretchen A. Mosher) 1901049

100 Application of Ozone Gas for Weight Loss Control of Fresh Figs • Presenting author: Leili Afsah-Hejri, University of California Merced, Merced, CA (Leili Afsah-Hejri, Arash Toudeshki, Taymaz Homayouni, Akram Gholami Pareh, Reza Ehsani) 1901315

101 Development of Online Quality Control for fermentation Process during Leavening of Dough Using FT-NIR and E-Nose • Presenting author: Madhuressh Dwivedi, National Institute of Technology, Rourkela, Odisha India (Sushil Singh, Poonam Singha) 1901078

102 Estimating Postharvest Loss, and Water and Energy Use in Florida Tomatoes Using Different Modeling Approaches • Presenting author: Ratna Suthar, University of Florida, Gainesville, FL (Ratna G. Suthar, Jorge I. Barrera, Jasmeet Judge, Jeffrey K. Brecht, William Pelletier, Rachata Muneeperearkul) 1900252

103 Development of 3D Printing Artificial Meat • Presenting author: Taeyeong An, Suncheon National University, Suncheon-si, Jeollanam-do, South Korea (Taeyeong An, Joo Lee, Kyeong Sik Choi, SungHyuk Kim, Seong-Yun Lee, Hoon Seonwoo, Ki-Chang Nam) 1901026

104 Optimization of Microwave-Assisted Extraction (MAE) of Phenolic Compounds and Antioxidants from Russian Olive Leaves Using Response Surface Methodology • Presenting author: Valerie Orsat, McGill University, Montreal, Quebec, Canada (Pariya Darvishzadehboroojeni, Valerie Orsat) 1900421

105 Osmotic Pressure of Selected Osmotic Solutions Estimated by Van’t Hoff’s Equation and a Thermodynamic Equation • Presenting author: Gretchen Mosher, Iowa State University, Ames, IA (Chad J. Dolphin, Gretchen A. Mosher) 1901049
Tuesday, July 9

131 Evaluating Soybean Quality Stored in Commercial Grain Bags • Presenting author: Nurun Nahar, North Dakota State University, Fargo, ND (Kenneth Hellevang) 1900864

132 Application of Analytical Hierarchy Process (AHP) in the Selection of a Biomass Burner for Maize Drying in a Crossflow Column Dryer • Presenting author: Samuel McNeill, University of Kentucky, Princeton, KY (George Obeng-Akrofi, Joseph Akowuah, A. Addo, Dirk Maier) 1901800

133 Harnessing Moringa oleifera seeds for Protein Malnutrition in Sub-Saharan Africa • Presenting author: Babatunde Ogunsina, Department of Agricultural and Environmental Engineering, Obafemi Awolowo University, Ile Ife, Osun State Nigeria (B. S. Ogunsina, C. Radha, D. Indrani, C. E. Chinma) 1900123

134 Effects of Postharvest Treatments on Qualities of Camellia oleifera Seed • Presenting author: Guanfei Zhu, China Agricultural University, Beijing, China (Guangfei Zhu, Yue Zhang, Yanhong Liu, Yongkang Xie, Yawen Lin, Dalong Jiang, Hongwei Xiao) 1901034

135 The Effects of Diffuse Coplanar Surface Barrier Discharge Plasma on Barley Inoculated with Mold Fungus and the Synthesis of Ochratoxin A • Presenting author: Oliver Schlüter, Leibniz Inst. Agric. Eng. and Bioeconomy, Potsdam, Brandenburg Germany (Julia Durek, Anne Roscher, Pawel Durek, Antje Fröhling) 1901171

250 Technical Trends and Career Opportunities in the U.S. and Korea—INVITED
Tuesday, July 9, 5:00pm-7:00pm
Location: Nantucket
Sponsored by: E-2050; AKABFE
Moderator: Young Ki Chang, Dalhousie University, Truro, NS Canada

5:05pm Plan of the Exchange & Cooperation on Agricultural Machinery between South and North Korea • Presenting author: Jong Hoon Chung, Seoul National University, Seoul South Korea 1901986

5:20pm Building a Bridge Between Agricultural Engineering and Environmental Science • Presenting author: Eunmi Hong, Kangwon National University, Gangwon, Korea 1901987

5:35pm AKABFE Third Research Spotlight Presentations by Postdoctoral Fellows and Students
Wednesday, July 10

Coffee and tea are available in the Exhibit Hall on Monday and Tuesday 9:00am-11:00am and 2:00pm-4:00pm, and Wednesday 7:00am-9:30am.

301 Best Practices in Graduate Programming and Professional Preparation—RAP
Wednesday, July 10, 7:30am-10:00am
Location: Boston University
Sponsored by: EOPD-203
Moderator: John Classen, North Carolina State University, Raleigh, NC

303 Techno-Economic and Life Cycle Assessment of Biomass Conversion
Wednesday, July 10, 7:30am-10:00am
Location: Harvard
Sponsored by: ES-220; PRS-280
Moderator: Deepak Kumar, University of Illinois, Urbana, IL

7:35am  Life Cycle Assessment Of Rice Production And Processing System  • Presenting author: Simeon Jekayina, Akintola University of Technology, Ogbomoso, Oyo State Nigeria (Simeon Jekayina) 1900108

7:50am  Techno-Economic Analysis of Front-End Fractionation Technologies in Dry Grind Ethanol Process  • Presenting author: Chinmay Kurambhatti, University of Illinois Urbana-Champaign, Urbana, IL (Chinmay Kurambhatti, Deepak Kumar, Kent Rausch, Mike Tumbleson, Vijay Singh) 1900830

8:05am  Life Cycle Assessment of Corn Stover Collection for Biobased Industries in Ohio Integrating Crop Modeling  • Presenting author: Asmita Khanal, The Ohio State University, Columbus, Ohio (Asmita Khanal, Garrett Steinbeck, Sami Khanal, Ajay Shah) 1901608

8:20am  Environmental Footprint Assessment of Representative Swine Diets in the USA  • Presenting author: Md Ariful Haque, Kansas State University, Manhattan, KS (Md Ariful Haque, Zifei Liu) 1901308

8:35am  BREAK

8:45am  Lifecycle and Techno-Economic Analysis of BioCNG Production from Organic Wastes and Energy Crops Using Integrated Anaerobic Digestion (i-AD) Technology  • Presenting author: Kamalakanta Sahoo, Forest Products Laboratory, Madison, WI (Sudhagar Mani) 1900320

9:00am  Life Cycle Assessment of Bio-Jet Fuels  • Presenting author: Kamalakanta Sahoo, Forest Products Laboratory, Madison, WI (Kamalakanta Sahoo, Naadadurai Kaliyan, Sudhagar Mani) 1901765

9:15am  A Consequential Life Cycle Assessment of Biofuel Production on Transportation Sector  • Presenting author: Nafisa Mahbub, University of Alberta, Edmonton, Alberta, Canada (Nafisa Mahbub, Eskinder Geemechu, Amit Kumar) 1900909

9:30am  Techno-Economic Analysis of Lactic Acid Production Using Corn Stover  • Presenting author: Ashish Manandhar, The Ohio State University, Wooster, OH (Ashish Manandhar, Ajay Shah) 1901645

304 Novel Data-Intensive Methods to Support Precision Agriculture
Wednesday, July 10, 7:30am-10:00am
Location: Northeastern
Sponsored by: ITSC
Moderator: Nourredine Abdoulmoumine, University of Tennessee, Knoxville, TN

7:35am  A Probabilistic Model for Estimating Harvested Areas via GPS Tracks  • Presenting author: Yaguang Zhang, Purdue University, West Lafayette, IN (Yang Wang, Dennis Buckmaster, James Krogmeier) 1901278

7:50am  Design of Maize Variable Fertilization Condition and Fault Warning System  • Presenting author: Yaohui Zhang, China Agricultural University, Beijing China (Yaohui Zhang, Kailiang Zhang, Yang Yu, Dongxing Zhang, LiYang, Tao Cui) 1900334

8:05am  Investigate the Spatial Relationship Between Wheat Streak Mosaic Infection and Pre-Harvest Hail by Using Archived Satellite Imagery and Meteorological Data  • Presenting author: Yeyin Shi, University of Nebraska-Lincoln, Lincoln, NE (Dongmei Chen, Lin Wang, Jingcheng Zhang, Rebecca Adams-Selin, Gary L. Hein, Yeyin Shi) 1901423

NO-SHOW  partial Routing Optimization for Regional Wheat harvesting in China  • Presenting author: Renhai Zhong, Zhejiang University, Hangzhou, Zhejiang, China (Zhixian Lin, Tao Lin) 1901135

8:35am  Identification of Winter Wheat in Anhui Province Based on Sentinel-2 Imagery Data  • Presenting author: Dongyan Zhang, Anhui University, Hefei, Anhui, China (Dongyan Zhang, Shengmei Fang, Bao she, Yuyang Yang, Yang Ding, Junwei Liu, Zhen Dai) 1900430

305 Robotics and Co-Robotics for Agriculture Part I
Wednesday, July 10, 7:30am-10:00am
Location: Tufts
Sponsored by: ITSC-318
Moderator: Daniel Jenkins, University of Hawaii, Honolulu, HI

7:35am  A Novel Weed and Crop Recognition Technique for Robotic Weed Control in a Lettuce Field with High Weed Densities  • Presenting author: Rekha Raja, University of California Davis, Davis, CA (Rekha Raja, David Slaughter, Steven Fennimore) 1900029

7:50am  Development of a Robotic Inspection System for Early Detection and Locating of Biotic Stresses in Greenhouse Crops  • Presenting author: Tamir Mhabary, Agricultural Engineering Institute, ARO, Rishon Lezion, Israel (Aviad Ozeri, Shimon Y. Nof, Yang Tao, Avital Bechar) 1900773

8:05am  A New Greenhouse Plant Phenotyping Robot Based on LeafSpec, Purdue’s Handheld Hyperspectral Leaf Imager  • Presenting author: Zhihang Song, Purdue University, West Lafayette, IN (Zhihang Song, Jian Jin) 1900947

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Wednesday, July 10

8:20am  Scheduling Performance of Harvest-Aiding Crop-Transport Robots under Varying Earliness in Access to Transport-Request Predictions  • Presenting author: Chen Peng, University of California, Davis, CA (Stavros Vougioukas) 1901310

8:35am  BREAK

8:45am  An Automated Robotic System to Measure Stem Diameter of Maize and Sorghum Plants in Greenhouse  • Presenting author: Abbas Atefi, Lincoln, NE (Yufeng Ge, Santosh Pitla) 1900891

9:00am  FarmBot—A Platform for Backyard Precision Farming: Installation and Initial Experimental Layout  • Presenting author: Jesu Raj Pandya, University of Maryland Eastern Shore, Princess Anne, Maryland (Abhijit Nagchaudhuri, T.Ford, K.Davis) 1900194

NO-SHOW  Auto-Steering Based Collaborative Operating System for In-field Fleet Management  • Presenting author: Caicong Wu, China Agricultural University, Beijing China (Chen Zhibo, Song Bingbing, Liang Yajie, Yang Lili) 1901356

9:30am  Methodology of Design and Simulation of a Custom Autonomous Agricultural Robot within ROS/Gazebo  • Presenting author: Jawad Iqbal, University of Georgia, Athens, GA (Piyush Pandey) 1901227

306 UAV for Sensing, Imaging, and Agricultural Aquacultural Applications Part II

Wednesday, July 10, 7:30am-10:00am
Location: Tremont
Sponsored by: ITSC
Moderator: Yu Jiang, University of Georgia, Athens, GA

7:35am  Principal Variable Selection to Explain Grain Yield Variations in Winter Wheat from UAV-Derived Growth Dynamics  • Presenting author: Jiating Li, University of Nebraska, Lincoln, NE (Jiating Li, Madhav Bhatta, Nicholas D. Garst, Hannah Stoll, Arun-Narenthiran Veeranampalayam-Sivakumar, P. Stephen Baenziger, Vikas Belamkar, Reka Howard, Yufeng Ge, Yevin Shi) 1901618

7:50am  Field-Region and Plant-Level Classification of Cotton Root Rot Based on UAV Remote Sensing  • Presenting author: Tianyi Wang, Texas A&M University, College Station, TX (Tianyi Wang, J. Alex Thomasson, Chenghai Yang, Thomas Isaakeit) 1901311

8:05am  Tree ‘Face’ Recognition In Unmanned Aerial Images  • Presenting author: Haoyu Niu, University of California, Merced, CA (Tiebiao Zhao, Yonghuan Yang, Haoyu Niu, Dong Wang, YangQuan Chen) 1901838

8:20am  Detection of Autumn Blooming in Pear Orchards Using Images Acquired by UAV and Machine Learning  • Presenting author: Raphael Linker, Technion, Haifa Israel (Mery Dafny-Yelin) 1900509

8:35am  BREAK

8:45am  Weed Location and Type Identification Using UAV Imagery and Deep Learning  • Presenting author: Aaron Etienne, Purdue University, West Lafayette, IN (Dharmendra Saraswat) 1901363

9:00am  Combining UAV-Based Vegetation Indices, Canopy Height and Canopy Coverage to Improve Rice Yield Prediction under Different Nitrogen Levels  • Presenting author: Liang Wan, Zhejiang University, Hangzhou, Zhejiang Province, China (Liang Wan, Haiyan Chen, Jiangpeng Zhu, Yuqian Li, Yueming Zhu, Dawei Sun, Haiyong Weng, Yong He) 1900626

9:15am  Research on the Influence of Leaf Surface Wettability on Droplet Deposition Effect  • Presenting author: Shupei Xiao, Zhejiang University, Hangzhou, Zhejiang Province, China (Shupei Xiao, Hui Fang, Yong He) 1900296

9:30am  Calibrating UAV-based Thermal Remote-Sensing Images of Crops with Temperature Controlled References  • Presenting author: Xiongze Han, Texas A&M University, College Station, TX (Xiongze Han, J. Alex Thomasson, Jeffery Siegfried, Rahul Raman, Nithya Rajan, Haly Neely) 1900662

9:45am  sUAS Intra-Canopy Sensing for Automated Stress Diagnosis Using Convolutional Neural Nets  • Presenting author: Christopher Wiegman, The Ohio State University, Columbus, OH (Christopher Wiegman, Scott Shearer, Andrew Klopfenstein) 1901277

307 Precision Application of Chemicals and Fertilizers

Wednesday, July 10, 7:30am-10:00am
Location: Vineyard
Sponsored by: MS-54; MS-23/6/1; MS-60
Moderator: Daniel Martin, USDA ARS, College Station, TX

7:35am  Nozzle Flowrate, Pressure Drop and Response Time of Different Pulse Width Modulation (PWM) Nozzle Control Systems  • Presenting author: Jonathan V. Fabula, Kansas State University, Manhattan, KS (Ajay Sharda, Daniel Flippo, Edwin Brokesh) 1901528

7:50am  Accuracy and Response Time of Pulse Width Modulated (PWM) Agricultural Self-Propelled Sprayer  • Presenting author: Jonathan V. Fabula, Kansas State University, Manhattan, KS (Ajay Sharda, Ignacio Ciampitti) 1901529

8:05am  Control of Insects and Diseases with Intelligent Variable-Rate Sprayers in Ornamental Nurseries  • Presenting author: Liming Chen, USDA ARS ATRU, Wooster, OH (Liming Chen, Matthew Wallhead, Heping Zhu, Amy Fulcher) 1900147

8:20am  Analysis of Advanced Airblast Sprayer Systems for Tree Crop Production  • Presenting author: Peter Ako Larbi, University of California, Parlier, CA (Franz Niederholzer) 1900985

8:35am  BREAK

8:45am  Effect of Emitter Modifications on Spraying Attributes of a Solid Set Canopy Delivery System (SSCDS) Configured for a High-Density Apple Orchard  • Presenting author: Rajeev Sinha, Washington State University, Prosser, WA (Lav Khot, Gwenn-Alyn Hoheisel, Mark Ledebruh, Matthew Grieshop) 1901221

9:00am  Design Modifications to an Automated Solid Set Canopy Delivery System (SSCDS) for Scale-Up and Improved Spray Uniformity  • Presenting author: Rakesh Ranjan, Washington State University, Prosser, WA (Rakesh Ranjan, Rajeev Sinha, Guobin Shi, Lav R Khot, Gwenn-Alyn Hoheisel, Matthew J Grieshop) 1901253

9:15am  Sensor for Measuring Mass Flow of Dry Fertilizer in an Air Stream  • Presenting author: Edwin Brokesh, Kansas State University, Manhattan, KS (Ajay Sharda) 1901283
Wednesday, July 10

331 Advanced ISO Standards Training—INVITED
Wednesday, July 10, 7:30am-10:00am
Location: MIT
Sponsored by: MS-23; US TAG ISO/TC23
Moderator: Nathan Turnis, John Deere, Bettendorf, IA
Edward Terhune, Senior Program Manager, American National Standards Institute (ANSI), New York, NY

308 Climate Change Impacts and Adaptation: Water Availability and Quality, & Agricultural Production
Wednesday, July 10, 7:30am-10:00am
Location: Clarendon
Sponsored by: NRES-22; NRES-21; NRES-223; NRES-25; NRES-26; NRES-28
Moderators: Anita Thompson, University of Wisconsin, Madison, WI; Vahid Rahmani, Kansas State University, Manhattan, KS

7:35am Potential Climate Change Adaptation Strategies for Cotton Production in the Texas High Plains • Presenting author: Srinivasalu Ale, Texas A&M AgriLife Research, Vernon, TX (Kritika Kothari, Srinivasalu Ale, James Bordovsky, Clyde Munster, Gerrit Hoogenboom) 1900648

7:50am Multiple Crop Models Projection of Irrigation Management for Wheat Production under Future Climate Change Scenarios in the Guanzhong Plain, China • Presenting author: Qaisar Saddique, Northwest A&F University, Yangling, Shaanxi China (Qaisar Saddique, Huanjie Cai) 1900415

8:05am The Effects of Future Extreme Precipitation Events on Stream Hydrology and Hydraulics of Stream Crossing Structures • Presenting author: Daniel Gambill, US Army ERDC-Construction Engineering Research Laboratory, Champaign, IL (Heidi Howard) 1900158

NO-SHOW Assessing the Impact of Climate Change on Water Security Status of the Grand River Watershed in South-Western Ontario, Canada • Presenting author: Baljeet Kaur, University of Guelph, Guelph, Ontario Canada (Narayan Shrestha, Prasad Daggupati, Ramesh P. Rudra, Rituraj Shukla, Nabil Allataifeh, Fahimeh Jafarianlari) 1901911

8:35am BREAK

8:45am Identifying Estuaries At-Risk of Eutrophication under Future Climate and Land Use Change Scenarios in the Southeast United States • Presenting author: Lise Montefiore, North Carolina State University, Raleigh, NC (Natalie Nelson) 1901443

9:00am Watershed Responses to Climate Change Conditions • Presenting author: Emily Steinweg, University of Minnesota, Saint Paul, MN (Gary Sands, Bruce Wilson, Brent Dalzell) 1900136

9:15am Evaluating Climate Change Impacts on Water Quantity and Quality of the Upstream Everglades System • Presenting author: Satbyeol Shin, University of Florida, Gainesville, FL (Satbyeol Shin, Younggu Her, Yogesh Khare) 1900588

9:30am Assessing the Potential Impacts of Climate and Land Use Change on Water Fluxes and Sediment Transport in a Coupled Natural and Human System • Presenting author: Subhasis Giri, Rutgers University, New Brunswick, NJ (Subhasis Giri, Nazia N. Arbab, Richard G. Lathrop) 1901510

9:45am Climate Change versus Critical Source Area and Pollution Export: An Adaptation Strategies through Conservation Practices • Presenting author: Subhasis Giri, Rutgers University, New Brunswick, NJ (Subhasis Giri, Richard G. Lathrop) 1901509

309 Flooding and Dams: Keeping Communities Safe—HYBRID
Wednesday, July 10, 7:30am-10:00am
Location: Berkeley
Sponsored by: NRES-25; NRES-2581; NRES-26
Moderators: Alica Ketcham, USDA NRCS, Richmond, VA; Emine Fidan, North Carolina State University, Raleigh, NC

7:35am Operation of Multipurpose Dams Using Artificial Neural Network • Presenting author: Seokhyeon Kim, Seoul National University, Seoul, South Korea (Seokhyeon Kim, Sangmin Jun, Kyeung Kim, Soonho Hwang, Moonseong Kang) 1900999

7:50am Reservoir Sediment Impacts on the Rehabilitation of NRCS-Assisted Flood Control Dams in Virginia • Presenting author: Alica J. Ketcham, USDA Natural Resources Conservation Service, Richmond, VA (Mathew Lyons, Rebecca Evans) 1900198

8:05am Rehabilitation of NRCS Floodwater Retarding Dams in Massachusetts • Presenting author: Deron Davis, State Conservation Engineer, Jim Lyons, Civil Engineer, USDA-NRCS, MA 1901911

8:35am BREAK

8:45am Using Machine Learning and Remotely Sensed Data to Develop Spatiotemporal Maps of Flood Surge and Retreat • Presenting author: Emine Fidan, North Carolina State University, Raleigh, NC (Emine Fidan, Natalie Nelson) 1900479

9:00am Development of Prediction Model for Flooded Areas by Reservoir Collapse • Presenting author: JongHyuk Lee, Seoul National University, Seoul, Republic of Korea (Jong-Hyuk Lee, Sang-Ik Lee, Jeong-Bae Jeon, Jun-Gu Lee, Won Choi) 1901335

9:15am Effects of Climate Variability and Land Use Changes on Urban Flooding in Houston Area • Presenting author: Muhammed Chowdhury, Doctoral Candidate, Kingsville,TX (Tushar Sinha) 1901207

9:30am Private Drinking Water Well Contamination Following Hurricane Florence • Presenting author: Randall Etheridge, East Carolina University, Greenville, NC (Randall Etheridge, Jacob Hochard, Ariane Peralta, Jamie Kruse) 1901145

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Wednesday, July 10

310 Hydrologic and Climate Data: Challenges and Opportunities
Wednesday, July 10, 7:30am-10:00am
Location: Arlington
Sponsored by: NRES-21; NRES-28
Moderators: Sushant Mehan, Formation Environmental LLC, Sacramento, CA; Subhasis Giri, Rutgers University, New Brunswick, NJ

7:35am Effects of Daily Mean Temperature Calculation Methods on Potential Evapotranspiration Estimates by Two Widely Used Methods for a Grass and a Forest Sites in SC • Presenting author: Devendra Amatya, USDA Forest Service, Cordville, SC (Devendra Amatya, Andy Harrison) 1900238

7:50am Modeling Non-Stationary Time Series for Groundwater Level Prediction Using Additive Models • Presenting author: Olufemi Abimbola, University of Nebraska-Lincoln, Lincoln, NE (Olufemi Abimbola, Aaron Mittelstet) 1901507

8:05am Analysis of Interaction between Probable Maximum Precipitation and Climatic Cycles under Climate Change in Texas • Presenting author: Kyungtae Lee, Texas A&M University, College Station, TX (Vijay Singh) 1900444

NO-SHOW Effect of Weather Variability on the Yield of Millet in North-Central, Nigeria • Presenting author: Olumuyiwa Idowu Ojo, Ladoke Akintola University of Technology, Ogbomoso, Nigeria (Olumuyiwa Ojo, Sunday Asaolu, Kehinde Ateniola) 1901295

8:35am BREAK

8:45am L-Moments Based Bias Correction of Extreme Precipitation Projected by Climate Models • Presenting author: Rohith A N, Indian Institute of Technology Madras, Chennai, Tamil Nadu, India (Rohith A N, Sudheer K P, Indrajeet Chaubey, Margaret W. Gitau) 1900829

NO-SHOW Variation in Minimum Temperature in South-West Nigeria • Presenting author: Olumuyiwa Idowu Ojo, Ladoke Akintola University of Technology, Ogbomoso, Nigeria (Olumuyiwa Ojo, Sunday Asaolu, Kehinde Ateniola) 1901295

NO-SHOW Climate Change Impact Assessment and Mitigation Measures for Sustainable Water and Agriculture Management in the Prince Edward Island • Presenting author: Ahmad Zeeshan Bhatti, University of Prince Edward Island, Charlottetown, PE Canada (Aitazaz Farooque, Bishnu Acharya, Nick Krouglico) 1901234

9:30am Changes in the Frequency of Hot, Humid Conditions in the Mississippi River Basin • Presenting author: Ameneh Tavakol, Department of Biological and Agricultural Engineering, Kansas State University, Manhattan, KS (Ameneh Tavakol, Vahid Rahmani) 1901502

311 Irrigation Management in Humid and Sub-Humid Regions
Wednesday, July 10, 7:30am-10:00am
Location: Provincetown
Sponsored by: NRES-24; NRES-241; NRES-244
Moderators: Stacia Davis Conger, Louisiana State University, Bossier City, LA; Jasreman Singh, University of Nebraska, Lincoln, NE

7:35am Regionalizing Seasonal Precipitation Patterns for Rainfed Agriculture in the Southeastern United States • Presenting author: Clement Sohoulande, USDA-ARS Coastal Plains Soil Water and Plant Research Center, Florence, SC (Ariel Szogi, Kenneth Stone, Phil Bauer) 1901900

7:50am Irrigation Considerations for Grain Crops in Ohio • Presenting author: Vinayak Shdedekar, The Ohio State University, Columbus, OH (Asmita Murumkar, Kevin King, Margaret Kalcic, Rafiq Islam, Larry Brown) 1901133

8:05am Evaluating the Necessity of Supplementary Irrigation in Songnen Plain of Northeast China Using a Distributed Agro-Hydrological Model • Presenting author: Jun Wang, China Institute of Water Resources and Hydropower Research, Beijing, China (Jun Wang, Jiusheng Li, Yanfeng Li) 1900493

8:20am A Mathematical Model to Adjust Crop Water Production Functions to Local Conditions • Presenting author: Joao Carlos Cury Saad, FCA-UNESP, Botucatu, SP, Brazil (Ana Paula Russo Schmidt Jefery, Deyver Bordin, Camila Pires Cremasco Gabriel, Luis Roberto Almeida Gabriel Filho, Joao Carlos Cury Saad) 1900295

8:35am BREAK

8:45am Experimental Determination of Growth-Stage-Specific Crop Coefficient of Jatropha curcas in Sub-Humid Region of Nigeria • Presenting author: Ewemwoje T. A., Agricultural and Environmental Engineering Department, University of Ibadan, Ibadan, Nigeria (Fabgayeide S. D., Ewemwoje T. A., Oluwasemire K. O.) 1900465

9:00am Improving Water Use Efficiency and Yield of Field Grown Pepper (Capsicum annuum L.) under Drip Irrigation in South Western Nigeria • Presenting author: Anthony Amori, Federal Polytechnic Ilaro, Ogun State, Nigeria (Samuel Fagbayide, Joshua Akintade, Mayiwa Okusanya) 1900301

9:15am Maize Yield Response to Irrigation and Planting Population on a Coarse-Textured Soil • Presenting author: Vasudha Sharma, University of Minnesota, Saint Paul, MN (Vasudha Sharma, Jeppe Kjaersgaard) 1901486

9:30am Development of a Wireless Sensor Network for Tracking Flood Irrigation Management in Production-Sized Rice Fields in the Mid-South • Presenting author: Yin-Lin Chiu, USDA-ARS, Jonesboro, AR (Yin-Lin Chiu, Michele L. Reba) 1901887

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Wednesday, July 10

312 Low Impact Development and Ecohydrology
Wednesday, July 10, 7:30am-10:00am
Location: Nantucket
Sponsored by: NRES-28; NRES-22
Moderators: Fouad Jaber, Texas A&M University, Dallas, TX; Christopher Nzediegwu, McGill University, Ste-Anne-de-Bellevue, Quebec Canada

7:35am Hydrologic and Water Quality Impacts of a Green Street Retrofit in Fayetteville, North Carolina  Presenting author: Sarah Waickowski, NC State University, Raleigh, NC (Kathryn Shaneyfelt, William Hunt) 1900323


8:05am Biochar and Bioretention—Studies Evaluating Water Quality and Hydrologic Performance for Biochar Amended Bioretention  Presenting author: John McMaine, South Dakota State University, Brookings, SD (Farhana Akhter) 1900625

8:20am Aging Bioretention: A Retrospective Comparison of Nutrient Treatment Efficiency in a 17-Year Old Bioretention Cell  Presenting author: William Hunt, NC State University, Raleigh, NC (William Hunt) 19001442

8:35am BREAK

8:45am Precipitation Trends and Low Impact Development Resiliency at South Central Missouri US Army Installation  Presenting author: Daniel Gambill, US Army ERDC-Construction Engineering Research Laboratory, Champaign, IL (Heidi Howard) 1901170

9:00am The Role of Tree Phenology on Urban Stormwater Management: A Case Study of Two Small Watersheds in the Kansas City Metropolitan Area  Presenting author: Alireza Nooraei Beidokhti, Kansas State University, Manhattan, KS (Alireza Nooraei Beidokhti, Trisha Lynn Moore) 1900860

9:15am Expanded Tree Pits as Part of a Low Impact Development Strategy for Urban Stormwater Management  Presenting author: Jing Ren, McGill University, Montreal, Quebec, Canada (Jing Ren, O. Grant Clark) 1901158

9:30am Treating Urban Stormwater with Suspended Pavement Systems and Street Trees  Presenting author: Kathleen Balaze, North Carolina State University, Raleigh, NC (Sarah Waickowski, William Hunt III) 1901665

9:45am Cold Temperature Effects on Nitrate Removal in Wood Chip Bioreactors Treating Subsurface Tile Drainage from Forage Production  Presenting author: Lordwin Jeyakumar, St. John’s Research and Development Ctr, St. John’s, NL Canada (Lordwin Jeyakumar, David McKenzie) 1901909

313 Modeling of Water Quality and Hydrology
Wednesday, July 10, 7:30am-10:00am
Location: Orleans
Sponsored by: NRES-21
Moderators: Chelsie Boles, Limno Tech, Ann Arbor, MI; Wenlong Liu, North Carolina State University, Raleigh, NC

7:35am Modeling the Impacts of Grassland Conversion on River Flow Regimes in Skunk Creek Watershed, Upper Midwest United States  Presenting author: Laurent Ahialame, University of California, San Diego, CA (Aleksey Y. Sheshukov, Esther Mosase, Jiyeong Hong) 1901232

7:50am Development and Utilization of a SWAT Watershed Model to Evaluate Benefits Associated with 4R Nutrient Stewardship in the Western Lake Erie Basin  Presenting author: Chelsie Boles, LimnoTech, Ann Arbor, MI (Derek Schlea, Todd Redder) 1901743

8:05am Predicting Impacts of the NOAA-NWS Runoff Risk Advisory Forecast on Water Quality with Multiple SWAT Watershed Models in the Western Lake Erie basin, USA  Presenting author: Asmita Murumkar, The Ohio State University, Columbus, OH (Asmita Murumkar, Jay Martin, Margaret Kalcic, Grey Evenson, Anna Apostel, Jeffrey Kast, Dustin Goering, Abram DaSilva, Andrea Thorstensen, Chelsie Boles, Todd Redder, Remegio Conesa) 1900625

8:20am Coastal water quality Dynamics and Modeling in Biscayne Bay, Florida  Presenting author: Pawan Upadhyay, Iowa State University, Ames, IA (Pawan Upadhyay, Anna Linhoss) 1900227

8:35am BREAK

8:45am Enhancing Agro-ecosystem Services Using Integrated Hydro-Ecologic and Socio-Cultural Models  Presenting author: Juan S. Acero Triana, UIUC, Urbana, IL (Juan S. Acero Triana, Maria L. Chu, Nathan Shipley, Carena van Riper, William Stewart, Cory Suski, Jorge A. Guzman) 1900004

9:00am Hydrologic Modeling of Extreme Events in Large-Scale Basin  Presenting author: Yu Zhang, Texas A&M University, College Station, TX (Yu Zhang, Vijay Singh) 1901272

9:15am Impact of Groundwater Withdrawal for Irrigation on Surface and Groundwater Interactions in the Lower Apalachicola-Chattahoochee-Flint River Basin, USA  Presenting author: Ritesh Karki, Auburn University, Auburn, AL (Puneet Srivastava, Jasmeet Lamba) 1900949

Wednesday, July 10

314 Nutrient Transport and Cycling: Measurements
Wednesday, July 10, 7:30am-10:00am
Location: Yarmouth
Sponsored by: NRES-22; NRES-224; NRES-23; NRES-25; NRES-26; NRES-28
Moderators: Rebecca Muenich, Arizona State University, Phoenix, AZ; Cibin Raj, Penn State University, University Park, PA
7:35am An Automated Chamber System to Complement Manual Measurements of Greenhouse Gas Fluxes from Agricultural Soil • Presenting author: Liam Fitzpatrick, McGill University, Montreal, Quebec, Canada (O.G. Clark, M.Y. Boh) 1901424
7:50am Long-Term Variation of Nitrate Concentration-Stream Discharge (C-Q) Relationship for an Agricultural Watershed in Midwest U.S. • Presenting author: Wenlong Liu, North Carolina State University, Raleigh, NC (Shiyiing Tian, Mohamed Youssef, George Chescheir, François Birgand) 1901796

NO-SHOW spatiotemporal Challenges for Nutrient Trading Applications to Water Quality • Presenting author: Daniel Andersen, Iowa State University, Ames, IA (Daniel Andersen, D.R. Raman, M.J. Helmers) 1901729
8:20am Measuring Water and Nutrient Movement in Compact Bed Plasticulture for Fresh Produce • Presenting author: Kira Hansen, University of Florida, Immokalee, FL (Sanjay Shukla, Rajendra Sishodia, Gregory Hendricks) 1901832
8:35am BREAK
8:45am Spatial and Temporal Patterns of Phosphorus Transport across Landscape Gradient from Agricultural Fields to Floodplain and Stream • Presenting author: Qualla Ketchum, Virginia Tech, Blacksburg, VA (W. Cully Hession) 1901774
9:00am Determining the Mineralization Rates of Nitrogen in Liquid Dairy Manure during Storage • Presenting author: Jactone Ogejo, Virginia Tech, Blacksburg, VA (Yihuai Hu, Jactone Arogo Ogejo) 1900899
9:15am An In-Situ Soil Nitrate Nitrogen Detection System Based on Ion-Selective Electrode • Presenting author: Miao Zhang, China Agricultural University, Beijing, China (Ming Chen, Miao Zhang, Qingliang Yang, Lan Yao, Xuming Wang) 1901453

315 Practices for Nutrient Loss Reduction in Drained Landscapes
Wednesday, July 10, 7:30am-10:00am
Location: Yarmouth
Sponsored by: NRES-23
Moderators: Matthew Helmers, Iowa State University, Ames, IA; Johann Vera, Purdue University, West Lafayette, IN
7:35am A Review and Synthesis of Control Factors on Dissolved Reactive Phosphorus Loads in Lake Erie Basin from Recent Studies • Presenting author: Xiaojing Ni, United States Environmental Protection Agency, Durham, NC (Yongping Yuan) 1900027
7:50am Quantifying Particulate Phosphorus Fluxes and Dynamics in Fine-textured Tile Drained Landscapes of Ohio • Presenting author: Saeid Nazari, University of Kentucky, Lexington, KY (Saeid Nazari, William Ford, Kevin King) 1901607
8:05am Dynamics of Phosphorus Transport from a Subsurface-Drained Field with Commercial Fertilizer Application • Presenting author: Md Sami Bin Shokrana, Michigan State University, East Lansing, MI (Ehsan Ghane) 1901612
8:20am Phosphorus Leaching as Influenced by Lime Application in Undisturbed Soil Columns with Different Soil Textures • Presenting author: Faezeh Eslamian, McGill University, Montreal, Quebec, Canada (Zhiming Qi, Mike Tate) 1900623
8:35am BREAK
8:45am Denitrifying Woodchip Bioreactor Performance in the “Real World” • Presenting author: Laura Christianson, University of Illinois, Urbana, IL (Laura Christianson, Ruth Book, Lauren Lukrins, Lyndsey Ramsey, Ryan Arch, Hannah Dougherty, Jeff Kirwan, Todd VerHecce, Michael Ganschow, Josh Joseph) 1901117
9:00am Comparison between Simulated and Field Measured Infiltration in Frozen and Unfrozen Soils in the Red River of the North Basin • Presenting author: Debjit Roy, Bangladesh Rice Research Institute, Gazipur, Bangladesh (Debjit Roy, Xinhu Jia, Jennifer Jacobs) 1900943
9:15am Impact of Hydraulic Residence Time and Woodchip Properties on Nitrate Removal in Pilot-Scale Woodchip Bioreactors • Presenting author: Michelle Soupir, Iowa State University, Ames, IA (Michelle Soupir, Emily Martin, Natasha Hoover, Morgan Davis, Gary Feyereisen, Thomas Isenhart, Thomas Moorman) 1900206
9:30am Water and Nutrient Budgets in Tile Drained Landscapes with and without Cover Crops • Presenting author: Kevin King, USDA-ARS Soil Drainage Research Unit, Columbus, OH (Kevin W. King, Vinayak S. Shedekar, Emily Duncan, Britanny Hanrahana, Margaret Kalicci) 1901891
9:45am Estimating Effectiveness of Drainage Water Management in Paired Field Studies • Presenting author: Vinayak Shedekar, The Ohio State University, Columbus, OH (Kevin King, Margaret Kalicci, Norman Fausey, Larry Brown) 1900624

316 Precision Irrigation
Wednesday, July 10, 7:30am-10:00am
Location: Hyannis
Sponsored by: NRES-24; MS-54
Moderators: Isaya Kisekka, University of California, Davis, CA; Abhilash Chandel, Washington State University, Prosser, WA
7:35am Irrigation Advancements in Furrow Irrigated Rice • Presenting author: Chris Henry, University of Arkansas, Stuttgart, AR (C. G. Henry, R. Mane, V. Kandpal, D. M. Pickelmann) 1901451
7:50am Application of Precision Irrigation for Intensively Grazed Pastures • Presenting author: Jake LaRue, Valmont Irrigation, Omaha, NE 1900031
Wednesday, July 10

8:05am  Design: Self-Monitoring Drip Irrigation Emitter for Precise Water Application  •  Presenting author: Hadi Al-agele, Oregon State University, Corvallis, OR (Chad Higgins) 1900880

8:20am  Technological Innovation of Irrigation in Agriculture from Past to Future to Improve Water Application Efficiency and Crop Production  •  Presenting author: Hadi Al-agele, Oregon State University, Corvallis, OR (Chad Higgins) 1900882

8:35am  BREAK

8:45am  Deep Reinforcement Learning Irrigation Optimization and Automated Scheduling for Fixed Zone Irrigation Systems  •  Presenting author: Hongxin Kong, Texas A&M University, College Station, TX (Yanxiang Yang, Jiang Hu, Dana Porter, Thomas Marek, Kevin Heflin, Hongxin Kong, Lijia Sun) 1900765

9:00am  Evaluation of Independent Irrigation Management of Different Almond Varieties within the Same Orchard during Pre-Harvest and Post-Harvest Periods  •  Presenting author: Kelley Drechsler, University of California, Davis, CA (Kelley Drechsler, Isaya Kisekka) 1900128

9:15am  Morning Crop Water Stress Index as a Sensitive Indicator of Water Status in Apple Trees  •  Presenting author: Abdelmoniem Z. Mohamed, Washington State University, Pullman, WA (Yossi Osroosh, R. Troy Peters, Travis Bates, Colin S. Campbell, Francesc Ferrer-Alegre) 1900577

317 PAFS Distinguished Lecture Series—INVITED

Wednesday, July 10, 7:30am-10:00am

Location: Simmons

Sponsored by: PAFS-40; PAFS-07/1; PAFS-20; PAFS-20/4; PAFS-234; PAFS-30; PAFS-40; PAFS-40/3/1; PAFS-50

Moderator: Brett Ramirez, Iowa State University, Ames, IA

7:30am  Simulation of Hydrogen Sulfide Emission from Deep-Pit Manure Storage During Agitation  •  Presenting author: Hongjian Lin, Department of Bioproducts and Biosystems Engineering, University of Minnesota, St. Paul, MN

8:00am  Carbon Footprint Assessment of a Large-Scale Pig Production System in Northern China: A Case Study  •  Presenting author: Hongmin Dong, Institute of Environmental and Sustainable Development in Agriculture (IEDA), Chinese Academy of Agriculture Sciences (CAAS), Beijing, China

8:30am  Dimensions of the Modern Pig  •  Presenting author: Jeremiah Davis, National Poultry Technology Center; Associate Professor, Department of Biosystems Engineering, Auburn University, Auburn, AL

9:00am  Henry Giese Award Winner  •  Presenting author: Baoming Li, Department of Agricultural Structure & Bioenvironmental Engineering, China Agricultural University, Beijing, China

318 Artificial Intelligence and Data Science (Big Data) in Processing

Wednesday, July 10, 7:30am-10:00am

Location: Boylston

Sponsored by: PRS-703; MS-23/7/2; PRS-280; PRS-701; PRS-702; ASE-16; ITSC-230; ITSC-254; ITSC-312; ITSC-318; ITSC-348

Moderator: Griffiths Atungulu, University of Arkansas, Fayetteville, AR

7:35am  Intelligent Aerated Bulk Storage System for Maintaining In-Shell Peanut Quality and Safety in the Tropics  •  Presenting author: Jose D. Guzman, Cagayan State University, Tuguegarao City, Cagayan, Philippines 1901367

7:50am  Mortality of Adult Red Flour Beetles in a Packed-Bed of Canola Seeds during 50 ohm RF Heating at Various Power Levels  •  Presenting author: Dayo Oke, University of Saskatchewan, Saskatoon, Saskatchewan, Canada (Tolen Tombung Moirangthem, Dayo Oke, Oon Doo Baik) 1901560

8:05am  Multivariate Near Infrared Spectroscopy for Predicting Polyhydroxybutyrate Production Cultured on Alkaline Pretreatment Liquor from Corn Stover  •  Presenting author: Mengxing Li, University of Nebraska-Lincoln, Lincoln, NE (Nuwan Wijewardane, Yufeng Ge, Mark Wilkins) 1900619

8:20am  Risk Prediction and Traceability Database Construction of Peanut Purchase and Storage Process  •  Presenting author: Hubo Xu, China Agricultural University, Beijing, China (Lingjuan Zhao, Kefei Yang, Hubo Xu, Bing Lu, Xuying Tang) 1900395

319 Food Process Engineering Part II

Wednesday, July 10, 7:30am-10:00am

Location: Columbus I

Sponsored by: PRS

Moderator: Ewunbua Monono, North Dakota State University, Fargo, ND


7:50am  Effects of Spray Drying Process Conditions on the Quality Properties of Instant Herbal Black Tea Powder  •  Presenting author: Dr Rakesh Kumar Raigar, CAEPHT, Central Agricultural University Imphal, Ranipool, Gangtok, Sikkim, India (Lalremruati) 1901444

8:05am  Performance of an Open Source Automatic Dry Aging System  •  Presenting author: Soon Kiat Lau, University of Nebraska-Lincoln, Lincoln, NE (Felipe Azevedo Ribeiro, Jeyamkondan Subbiah, Chris R. Calkins) 1901539

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Wednesday, July 10

8:20am  Impact of Post-harvest Electron Beam Irradiation and Storage Conditions on Quality Characteristics of Long-Grain Hybrid Rice  • Presenting author: Zeinab Mohammadi Shad, University of Arkansas, Fayetteville, AR (Zeinab Mohammadi Shad, Emiel Steen, Griffiths G. Atungulu) 1900959

8:35am  BREAK

8:45am  Effects of Transglutaminase in Product Formulation on Physico-Textural Properties of Protein Rich Extruded Snacks  • Presenting author: Felix Akharume, University of Kentucky, Lexington, KY (Felix Akharume, Youling L. Xiong, Akinbode Adedeji) 1900306

9:00am  Effects of Air Dehumidification on the Performance of a Fluidized Bed Dryer and the Rice Quality  • Presenting author: Kaushik Luthra, University of Arkansas, Little Rock, AR (Sammy Sadaka) 1900322


320 Grain Drying, Storage and Aeration Systems—INVITED

Wednesday, July 10, 7:30am-10:00am
Location: Columbus II
Sponsored by: PRS-702
Moderator: Kingsly Ambrose, Purdue University, West Lafayette, IN

7:35am  Impact of Drying and Storage Conditions on the Physical Quality of Green and Semi-Green Soybeans  • Presenting author: Ibukunoluwa Ajayi-Banji, North Dakota State University, Fargo, ND (Ibukunoluwa Ajayi-Banji, Kenneth Hellevang, Ewumba Monono, Jasper Teboh) 1900557

7:50am  Evaluation of Low-Power, Wireless Sensors for Automated Quality Monitoring and Management of Stored Grain Inventory  • Presenting author: Guy Roger Aby, Dirk Maier, Iowa State University, Ames, IA (Roger Guy Aby, Dirk Maier) 1901850

8:05am  Fissuring Kinetics of Rough Rice during Drying  • Presenting author: Zephania Odek, University of Arkansas, Fayetteville, AR (Z. Odek, T.J. Siebenmorgen) 1901851

8:20am  Pressure Testing to Estimate Grain Storage Structure Leakiness  • Presenting author: Carol L Jones, Oklahoma State University, Stillwater, OK (Carol Jones, Taylor Conley, Mark Casada, Frank Arthur) 1901852

8:35am  BREAK

8:45am  Effect of Storage Moisture Content on Milling Characteristics of Rice  • Presenting author: Bhagwati Prakash, University of Arkansas, Fayetteville, AR (B. Prakash, T. J. Siebenmorgen, K. E. Gibson, S. Kumari) 1900199

9:00am  Physical Disturbance Time Interval Optimization for Control of Weevils in Stored Maize  • Presenting author: Mike Sserunjogi, Iowa State University, Ames, IA (Carl Bern, Thomas Brumm, Dirk Maier) 1900243

9:15am  Using an Eighth-Scale Grain Drying System to Compare Effects of Drying with Ambient Air versus Heated Air  • Presenting author: Micah Lewis, USDA ARS, Athens, GA (Micah Lewis, Samir Trabelsi, Stuart O. Nelson) 1901892

321 Physical Properties Related to Processing and Handling

Wednesday, July 10, 7:30am-10:00am
Location: St. Botolph
Sponsored by: PRS-702; PRS-701
Moderator: Igathinathane Cannayen, North Dakota State University, Fargo, ND

7:35am  Effects of High-Intensity Ultrasound Processing on the Hydrodynamic Properties, Color, Particles Size, Pectin, and Microstructure of Kiwifruit Juice  • Presenting author: Jin Wang, McGill University, Sainte-Anne-de-Bellevue, Quebec Canada (Jin Wang, Vijaya Raghavan) 1900271

7:50am  Evaluation of Physical and Mechanical Properties of Carrot Rejects/Waste for the Design and Development of Carrot Processing Equipment  • Presenting author: Gaganjyot Madanpotra, University of Guelph, Guelph, Ontario Canada (Ranbeer Singh Sandhu, Ashutosh Singh) 1901422

NO-SHOW Modeling of Fine Materials Distribution in an Experimental Silo Using Dimensional Analysis  • Presenting author: Shubham Subrot Panigrahi, University of South Australia, Adelaide Australia (D. Zare, A. Nourmohamadi-Moghadam, Chandra B. Singh, Richard L. Stroshine, Shubham Subrot Panigrahi) 1900972

8:20am  Consistency Assessment of Rice Milling Quality Results from USDA-FGIS Laboratory Mill and Commercial Mills  • Presenting author: Ragab Khir, University of California, Davis, Davis, CA (Zhaokun Ning, Cathleen Brenner, Tara McHugh, Zhongli Pan) 1901250

8:35am  BREAK

8:45am  Characterizing Adhesion Force of Dust to Corn Kernels  • Presenting author: Benjamin Plumier, Purdue University, West Lafayette, IN (Yumeng Zhao, Mark Casada, Ronado Maghirang, Kingsly Ambrose) 1900668

9:00am  Water Activity Change of Egg Powders at Elevated Temperatures Modeled by Clausius Clapeyron Equation  • Presenting author: Marco Esteban Pérez Reyes, Washington State University, Pullman, WA (Marco Esteban Pérez Reyes, Juming Tang, Mei-Jun Zhu, Gustavo Barbosa Cánovas) 1900676

9:15am  Study of Total Volatile Basic Nitrogen Content in Chilled Beef for Freshness Evaluation by Texture Profile Analysis  • Presenting author: Hubo Xu, Northeastern University, Boston, MA (Hubo Xu, Yingzi Lin, Beibei Zhang, Xiuying Tang) 1900351

9:30am  Characterization of Proteins Extracted from Eggshell Membrane Fraction of Processed Eggshell Waste  • Presenting author: Mary-Grace Danao, University of Nebraska-Lincoln, Lincoln, NE (Patricia A. Reyes, Mary-Grace C. Danao, Kaustav Majumder) 1900461

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Wednesday, July 10

302 Dealing with Ethical Issues in Engineering Standards—INVITED
Wednesday, July 10, 10:15am-12:15pm
Location: MIT
Sponsored by: EOPD
Moderator: Robert J. Gustafson, Professor Emeritus, Ohio State University, Delaware, OH
10:20am Keynote Speaker: Mr. Christian Dubay, P.E., Vice President and Chief Engineer, National Fire Protection Association, Quincy, MA • Mr. Dubay will address his experience and perspectives on Ethics Issues in Standards Development and Application. This will be followed by a panel discussion. Participants in the panel will include ASABE members with a wide range of experience with standards.
10:40am Panel Discussion

322 EOPD—Education, Outreach, & Professional Development POSTER SESSION
Wednesday, July 10, 10:15am-12:15pm
Posters will be displayed for the entire session, but authors will be present at posters as follows:
10:15am-11:15am, authors with ODD numbered posters present
11:15am-12:15pm, authors with EVEN numbered posters present
Location: Gloucester
Sponsored by: EOPD
Moderator: Richard Beard, Utah State University, Logan, UT

NO-SHOW New Education of Farmers for Water Saving to a Measure • Presenting author: Jong-Won Do, Korea Rural Community Corporation, Daejeon, Republic of Korea (Jong-Won Do, Kyung-Sook Choi, Seul-Gi Lee, Kwang-Ya Lee, Eui-Yup Jung) 1900690

323 Biomass Feedstock Supply Logistics and Modeling
Wednesday, July 10, 10:15am-12:15pm
Location: Boston University
Sponsored by: ES-220; ASE-12
Moderator: Igathinathane Cannayen, North Dakota State University, Fargo, ND
10:20am Techno-Economic Analysis of a Hybrid Solar-Biomass System for Domestic Energy Supplying • Presenting author: Congguang Zhang, The Ohio State University, Wooster, OH (Congguang Zhang, Ajay Shah) 1901605
10:35am Biomass Pretreatment by Magnesium Oxide for Reducing Sugar Degradation and Water Consumption in Biofuel Production • Presenting author: Jun Li, Kansas State University, Manhattan, KS (Meng Zhang, Donghai Wang) 1900157
10:50am Developing a Viable Biomass Feedstock Supply Chain to Meet the Renewable Fuel Standards • Presenting author: Daniela S. Jones, North Carolina State University, Raleigh, NC (Daniela S. Jones, Stephen Searcy) 1900104

11:05am Why a Multi-bale Handling Unit is Essential for Efficient Feedstock Logistics • Presenting author: Robert Grisso, Virginia Tech, Blacksburg, VA (Robert “Bobby” Grisso, John S. Cundiff, Kevin Comer) 1900802
11:35am Evaluating the Physical and Compositional Characteristics of Corn Residues during the Drydown Period • Presenting author: Asmita Khanal, The Ohio State University, Columbus, Ohio (Asmita Khanal, Seyed Hashem Mousavi Avval) 1901610
11:50am Comparison of Vertical Hydro-Transport of Lignocellulosic Biomass with Conventional Solids • Presenting author: Kashif Javed, University of Alberta, Edmonton, Alberta, Canada (Kashif Javed, Mahdi Vaezi, Vinej Kuriak, Anmit Kumar) 1900872

324 Energy Utilization and Lighting in Agricultural Operations and Facilities
Wednesday, July 10, 10:15am-12:15pm
Location: Harvard
Sponsored by: ES-300; ES-310; ES-311
Moderator: Kip Pheil, USDA NRCS, Portland, OR
10:20am Expanded LED Benefits through an Automated Long Day Lighting System at a 3x Milking Dairy Farm • Presenting author: Benjamin VanZweden, Michigan State University, East Lansing, MI (Benjamin VanZweden, Aryn Thomas, Aluel Go, Truman Surbrook) 1900042
10:35am A Decision Support and Optimization Platform for Energy Technology Investments on Dairy Farms • Presenting author: Philip Shine, Cork Institute of Technology, Cork, Ireland (Michael Breen, John Upton, Adam O’Donovan, Michael D. Murphy) 1901055
10:50am Energy Efficiency Improvements on Kentucky Dairy and Poultry Farms • Presenting author: Doug Overhults, University of Kentucky, Lexington, KY (Sam McNeill, Aaron Turner) 1901313
11:05am A Summary of Energy Audits for Grain Driers in Kentucky • Presenting author: Samuel McNeill, University of Kentucky, Princeton, KY (Sam McNeill, Aaron Turner, Douglas Overhults, Michael Montross) 1901792
11:20am Modelling the Thin Layer Drying Kinetics of Cocoa Beans in a Passive Solar Dryer and under Open Sun • Presenting author: Okonkwo Wilfred Ifeanyi, University of Nigeria, Nsukka, Enugu State, Nigeria (Eusebius Tochekwu Okorie) 1900244
11:35am Analytical Estimation and Experimental Validation of Wind Energy Utilization Using Turbine for Mechanical Aeration of Small Scale Ear Corn Drying • Presenting author: Akinbode A. Adedeji, University of Kentucky, Lexington, KY (Francis Agbali, Akinbode Adeleji) 1901091
11:50am The Efficiencies, Environmental Impacts and Economics of Energy Consumption for Groundwater-based Irrigation in Oklahoma • Presenting author: Divya Handa, Oklahoma State University, Stillwater, OK (Divya Handa, Robert S. Frazier, Saleh Taghvaian, Jason G. Warren) 1900665

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Wednesday, July 10

12:05pm Mint Distillation Condenser Cooling Water Recirculation System to Reduce Water Usage • Presenting author: Scott Sanford, University of Wisconsin-Madison, Madison, WI (David Bohnhoff, Amanda Beistle, Wilhelm Heider, Derek Vanstone, Tanner Wick) 1900612

325 Lighting Systems for Plant Production —Standards, Systems, and Science—INVITED

Wednesday, July 10, 10:15am-12:15pm
Location: Brandeis
Sponsored by: ES-311
Moderator: Carl Bloomfield, Intertek Testing Services, Arlington Heights, IL

10:25am Standard 640—Definitions • Presenting author: Jianzhong Jiao (Jianghong Jiao) 1901954

10:35am Standard 642—Testing • Presenting author: Carl Bloomfield, Intertek Testing Services, Arlington Heights, IL (Carl Bloomfield) 1901952

10:45am Standard 644—Performance • Presenting author: Kip Pheil, USDA NRCS, Portland, OR (Kip Pheil) 1901956

10:55am DesignLights Consortium Program for Horticultural Lighting Products • Presenting author: Damon Bosetti, DesignLights Consortium, Medford, MA (Damon Bosetti) 1901953

11:15am Designing and Manufacturing Horticultural Luminaires to Meet Industry Specifications and Growers Needs • Presenting author: Roy Harvey, Osram Sylvania Inc, Wilmington, MA (Roy Harvey) 1901955

11:35am Designing and Manufacturing Horticultural Luminaires to Meet Industry Specifications and Growers Needs • Presenting author: Rachelle Winningham, Signify Lighting, Rosemont, IL 1901997

11:55am Roundtable Discussion

326 Apps in Agricultural Applications

Wednesday, July 10, 10:15am-12:15pm
Location: Northeastern
Sponsored by: ITSC-254
Moderator: Mario R. Mondaca, University of Wisconsin, Madison, WI

10:20am Soil Sampling Utility: A Windows-Based Freeware Application for Precision Soil Sampling • Presenting author: Kendall Kirk, Clemson University, Blackville, SC (Kendall R. Kirk) 1901789

10:35am Smartphone Warn Producers When to Irritate Mango Trees • Presenting author: Federico Hahn, Universidad Autonoma Chapingo, Texcoco, Edomex, Mexico (Federico Hahn, Jesús García) 1900596

NO-SHOW Irrigation Advisory Services for Farmers of Pakistan —A SUCCESS in Agro-Environmental Communication • Presenting author: Ahmad Zeeshan Bhatti, University of Prince Edward Island, Charlottetown, PE Canada (Ahmad Zeeshan Bhatti, Faisal Hossain, Muhammad Ashraf, Aitazaz Ahmad Farooque) 1901237

NO-SHOW Smartphone Based Evaluation of the Operating Behaviors of Agricultural Machinery • Presenting author: Jiahua Huang, China Agricultural University, Beijing, China (Jiahua Huang, Shuo Liang, Zhihong Kou, Zhouyu Xiong, Xin Zhao, Caicong Wu) 1901568

11:20am Web Tool for Classification and Quantification of Flowers for Pollinators Interaction Using R • Presenting author: Subhashree Navaneetha Srinivasagan, North Dakota State University, Fargo, ND (Subhashree Srinivasagan) 1901275

11:35am Adjusting Sowing Decisions to Reduce the Risk of Extreme Weather Events with AgroClimate Crop Season Planning Tool • Presenting author: Daniel Perondi, University of Florida, Gainesville, FL (Daniel Perondi) 1901271

11:50am Metadata App—Streamlining the Generation of the Backstory • Presenting author: Dennis Buckmaster, Purdue University, Rossville, IN (Dennis Buckmaster) 1900553

327 Biosensors and Bioelectronics

Wednesday, July 10, 10:15am-12:15pm
Location: Tufts
Sponsored by: ITSC-230; ITSC-353
Moderators: Mei He, University of Kansas, Lawrence, KS; Sindhuja Sankaran, Washington State University, Pullman, WA

10:20am ABE-Stat 3: New Applications and Upgraded Hardware for Improved Performance • Presenting author: Daniel Jenkins, University of Hawaii, Honolulu, HI (Daniel Jenkins) 1901678

10:35am A Portable Sensing Device with Magnetic Separation and Quantum Dots Labeling for Simple, Rapid and Quantitative Detection of Salmonella Typhimurium • Presenting author: Junxin Xie, University of Arkansas, Fayetteville, AR (Junxin Xie) 1900564

10:50am Research Progress on the Detection of Heavy Metal Ions by Electrochemical Biosensors • Presenting author: Qiuying Zou, Shenyang Agricultural University, Shenyang, Liaoning China (Qiuying Zou) 1901797

11:05am A Nanobiosensor Based on Integrated Nanochannel-Electrode System for Rapid Detection of Salmonella in Chicken Products • Presenting author: Yingchun Fu, Zhejiang University, Hangzhou, Zhejiang China (Yingchun Fu) 1900595

NO-SHOW Laser Scribed Graphene Sensors for Point of Use Detection of Listeria monocytogenes • Presenting author: Eric McIlvar, University of Florida, Gainesville, FL (Eric McIlvar) 1901766

11:35am Dual-Channel Aptasensor for Mercury Ions Sensing in Maize Using Au@Ag/graphene-UCNPs as MEF and SERS Signal Indicators • Presenting author: Huanhuan Li, Jiangsu University, Zhenjiang, Jiangsu China (Huanhuan Li) 1900363
Wednesday, July 10

11:50am  Rapid Detection of Inorganic Arsenic: A Real-Time Screening Method Based on De-Aggregation of Gold Nanoparticles  • Presenting author: Mike Bismuth, Institute of Agricultural Engineering, Agricultural Research Organization, the Volcani Center, Rishon Le’Zion, Israel (Mike Bismuth, Giorgi Shentenberg) 1900719

12:05pm  Enhancement of Alcohol Oxidase and Alcohol Oxidase Biosensors Using High Hydrostatic Pressure  • Presenting author: Daoyuan Yang, University of Georgia, Athens, GA (Jose I. Reyes De Carcuer, Daniel Jenkins) 1901388

328 Robotics and Co-Robotics for Agriculture Part II
Wednesday, July 10, 10:15am-12:15pm
Location: Simmons
Sponsored by: ITSC
Moderator:
10:20am  Development of a Modular Agricultural Robot for High Throughput Phenotyping  • Presenting author: Rui Xu, Athens, GA (Jawad Iqbal, Changying Li, Andrew H. Paterson, Javad Mohammadpour Velni) 1900597
10:35am  Navigation Control of Automated Ground Robots with Articulated Steering for Field-Based Plant Phenotyping  • Presenting author: Lie Tang, Iowa State University, Ames, IA (Wenyu Zhang, Taylor Tuel, Lie Tang) 1901340
10:50am  Visual Kinematics Control of Cotton-Picking Rover Manipulator Using a ROS-independent Finite State Machine  • Presenting author: Kadeghe G Fue, University of Georgia, Tifton, GA (Kadeghe Fue, Edward Barnes, Wesley Porter, Glen Rains) 1900779
11:05am  Mobile Robotics Platform for Whole-Poultry-House Approach to Compartmentalized Egg Production Management  • Presenting author: Guoqiang Ren, Zhejiang University, Hangzhou, Zhejiang, China (Guoqiang Ren, Zhixian Lin, Tao Lin, Yibin Ying, Girish Chowdhary, K.C. Ting) 1900685
11:20am  Complete Coverage Infield-path Planning for Auto-guided Tillaging in Polygonal Paddy Fields  • Presenting author: Chan-Woo Jeon, Seoul National University, Seoul, Republic of Korea (Chan-Woo Jeon, Hak-Jin Kim, Changho Yun, Min-Suk Kang, Xiong Zhe Han) 1901037
11:35am  Hybrid Systems Based Modeling and Control of Heterogeneous Agricultural Robots for Field Operations  • Presenting author: Chanyoung Ju, Chonnam National University, Gwangju, Gwangju, Republic of Korea (Chanyoung Ju, Hyoung Il Son) 1900316
11:50am  Non-GPS Based Unmanned Ground Autonomous Robotic Navigation Strategies for Under-Canopy Sensing  • Presenting author: Ryan Humphrey, University of Nebraska-Lincoln, Lincoln, NE (Ryan Humphrey, CheeTown Liew, Santosh Pitla, Tyler Troyer) 1901798
12:05pm  Implementation, Analysis and Control Using the ifm O3M151 3D Sensor on J1939 CANbus Network  • Presenting author: Josh Murman, University of Nebraska-Lincoln, Lincoln, NE (Josh Murman, Santosh Pitla) 1901154

329 Sensors and Control Systems for Food Production and Processing
Wednesday, July 10, 10:15am-12:15pm
Location: Vineyard
Sponsored by: ITSC
Moderator:
10:20am  Performance of a New Non-Destructive Firmness Device, Comparisons with Other Devices for Kiwifruit Measurement and the Surprising Effect of Storage Age  • Presenting author: Andrew McGlone, Plant & Food Research, Hamilton, New Zealand (Andrew McGlone, Ellen Bayliss, Anne White, Mark Wohlers, Peter Schaare) 1900151
10:35am  Different Numerical Analysis Algorithms for Egg’s Dynamic Weighing Using Digital Signal Processor  • Presenting author: Chaojie Li, College of Biosystems Engineering and Food Science, Zhejiang University, Hangzhou China (Chaojie Li, Xiaotian Chen, Limin Zou, Jianping Wang) 1900318
10:50am  An Investigation into Using Air Pulse Excitation for Rapid Non-Contact Fruit Firmness Measurement  • Presenting author: Samuel Langdon-Arms, The New Zealand Institute for Plant and Food Research Ltd., Hamilton, New Zealand (Andrew McGlone, Peter Schaare, Rod McDonald) 1900188
11:05am  Comparison of Signal Drifting Calibration Methods for ISEs based Hydroponic Macronutrients Monitoring  • Presenting author: Miao Zhang, China Agricultural University, Beijing, China (Qingliang Yang, Miao Zhang, Linpei Pan, Ming Chen, Maohua Wan) 1900672
11:20am  Florida Polytechnic University’s Intelligent Garden  • Presenting author: Melissa Morris, Florida Polytechnic University, Lakeland, FL (Melissa Morris, Grant Percy, Nicoleta Hickman) 1901490

330 Handling, Storage, Transport, and Processing of Forages and Biomasses
Wednesday, July 10, 10:15am-12:15pm
Location: Clarendon
Sponsored by: MS-23/7/2
Moderator: Elizabeth Miller, John Deere, Ottumwa, IA

10:20am  Industrial Hemp Harvesting and Decorticating Review  • Presenting author: Jude Liu, Penn State University, University Park, PA (Alyssa Collins, Jeffrey Graybill, Gregory Roth) 1901505
10:35am  Postharvest Handling of Chopped Biomass Feedstocks through Densification for Long-Term Storage  • Presenting author: Carrie Sanford, Lucas Mitchell, Hannah Monroe, NC State University, Raleigh, NC (Lucas Mitchell, Hannah Monroe, Edward Godfrey, Matthew Whitfield, Mari Chinn) 1901770
10:50am  Flow Field Analysis and Structure Improvement of Sugarcane Chopper Harvester Extractor  • Presenting author: Shaochun Ma, CAU, Beijing, China (Haonan Xing, Shaochun Ma, Fenglei Wang, Jing Bai, Jinzhi Ma, Wenli Ke, Shili Gao) 1900641

NO RECORDING of the participants’ remarks is permitted. Pictures of any material shown here are PROHIBITED.
Wednesday, July 10

**NO-SHOW**  Design and Test of Flexible Low-Loss Maize Picking Device for Fresh Corn  ·  Presenting author: Tianyu Li, Northeast Agricultural University, Harbin, Heilongjiang Province, China (Li Tianyu, Zhou Fujun, Xu Chunlin) 1900689

11:20am  Compressibility and Angle of Repose of Different Pelleted Material  ·  Presenting author: Josh Jackson, University of Kentucky, Lexington, KY (Mike Montross, Aaron Turner) 1900842

11:35am  Statics and Modal Analysis of the Main Structure of Multi-Dimensional Sieving Machine  ·  Presenting author: Jing Zhang, Jiangsu University, Zhenjiang, Jiangsu, China (Qizhi Yang, Jing Zhang, Li Xu, Guanlong Huang, Guangyu Du, M. Addy) 1901562

**332 Precision Agricultural Utilization in Chemical and Fertilizer Applications**  Wednesday, July 10, 10:15am-12:15pm  Location: Arlington  Sponsored by: MS-23/6; MS-54  Moderator: Chris Bursiek, John Deere, Ankeny, IA


11:05am  On and Off-Target Spray Deposition from a Solid Set Canopy Delivery System and an Axial-Fan Airblast Sprayer Tested for Vineyard Spray Applications  ·  Presenting author: Rajeel Sinha, Washington State University, Prosser, WA (Lav Khot, Gwen-Alyn Hoheisel, Matthew Grieshop, Matthew Steward, Rakesh Ranjan) 1901228

11:20am  Measuring and Modeling the Movement of Spray Droplets into Off-Target Areas  ·  Presenting author: Brian L. Steward, Iowa State University, Ames, Iowa (Brian L. Steward, H. Mark Hanna, Philip M. Dixon, Rithana K. Mompremier) 1901496

11:35am  Evaluation of Laser-Guided Intelligent Sprayer to Control Insects and Diseases in Fruit Plants  ·  Presenting author: Liming Chen, USDA ARS ATRU, Wooster, OH (Liming Chen, Heping Zhu, Matthew Wallhead, Michael Reding, Leona Horst) 1900146

11:50am  Interactions of Hairy Trichomes with Sprayed Droplet Adhesion and Spreading on Leaves  ·  Presenting author: JohnPaul R. Abbott, ARS-USDA-ATRU, Wooster, OH (Heping Zhu) 1900219

**333 Applications of Remote Sensing and UAVs in Irrigation Management**  Wednesday, July 10, 10:15am-12:15pm  Location: Falmouth  Sponsored by: NRES-24; NRES-241; NRES-244  Moderators: Charles Hillyer, IFF, Amarillo, TX; Abdelmoneim Mohamed, Washington State University, Prosser, WA


10:35am  Estimation of Surface Evapotranspiration in Daxing District based on SEBS Model Validated by Large Aperture Scintillator  ·  Presenting author: Xin Han, IWHR, Haidian District, Beijing China (Xin Han, Baozhuang Zhang, Zheng Wei, He Chen, Yinong Li, Taisheng Du) 1900494


11:05am  Assessment of Thermal Infrared Sensors and their Accuracy in Low Altitude Unmanned Aerial System Remote Sensing  ·  Presenting author: Mitchell Maguire, University of Nebraska Lincoln, Lincoln, NE (Christopher Neale, Wayne Woldt) 1900855

11:20am  Remote Sensing Data as Decision Support Tool for Center Pivot Irrigation Management  ·  Presenting author: Anh Nguyen, University of Missouri Columbia, MO (Allen L. Thompson, Kenneth A. Sudduth, Earl Vories) 1900811

11:35am  A Comparison of UAVs and Remote Sensing to Schedule Irrigation for High Value Processing Crops  ·  Presenting author: Chandra Madramootoo, McGill University, Ste. Anne de Bellevue, Quebec Canada (Chandra A. Madramootoo) 1901860

11:50am  Low Altitude High Resolution Remote Sensing Based Evapotranspiration Mapping for Potato Crop  ·  Presenting author: Abhilash Chandel, Biological Systems Engineering, Washington State University, Prosser, WA (Abhilash Chandel, Behnaz Molaei, Lav R. Khot, Troy Peters, Claudio Stockle) 1901847

**334 CN Hydrology and Alternative Approaches for Runoff Volume or Runoff Rate**  Wednesday, July 10, 10:15am-12:15pm  Location: Provincetown  Sponsored by: NRES-21; NRES-25; ASCE-EWRI  Moderators: Ernest Tollner, University of Georgia, Athens, GA; Vamsi Krishna Vema, West Lafayette, IN

10:20am  Assessing Runoff Using Modified SME-CN Method for a Drained Forest Watershed on North Carolina Atlantic Coastal Plain  ·  Presenting author: Andrzej Walega, University of Agriculture
Wednesday, July 10

336 Denitrifying Bioreactors: Present State and Future Opportunities—RAP
Wednesday, July 10, 10:15am-12:15pm
Location: Yarmouth
Sponsored by: NRES-23
Moderators: Chris Hay, Iowa Soybean Association, Ankeny, IA; Gary Feyereisen, USDA ARS SWMRU, St. Paul, MN

Denitrifying bioreactors represent one technology that has promise to reduce nitrate losses from subsurface drainage systems. The first field bioreactors are now reaching a decade in age and issues, problems, and opportunities for advancement are surfacing. This session is an opportunity for researchers and practitioners to meet to brainstorm and discuss existing needs and a path forward to make bioreactors a viable practice for large-scale implementation.

337 Drought and Water Security—HYBRID
Wednesday, July 10, 10:15am-12:15pm
Location: Berkeley
Sponsored by: NRES-25; NRES-251; NRES-21; NRES-24; NRES-28; NRES-26
Moderators: Tushar Sinha, Texas A&M University, Corpus Christi, TX; Emily Steinweg, University of Minnesota, St. Paul, MN

10:20am Global Water Security for Agriculture and Natural Resources—Recommendations from Global Engagement Initiative
Presenting author: Indrajeet Chaubey, Dean of the College of Agriculture, Health, and Natural Resources, University of Connecticut, CT (Indrajeet Chaubey, R. Daren Harmel, Indra Mani) 1901910

10:50am A review on Agricultural Drought Analysis Modeling
Presenting author: Subhashree Navaneetha Srinivasagam, North Dakota State University, Fargo, ND (Gathinathane Cannayan, John Hendrickson, David Archer) 1901271

11:05am Declining Soil Moisture Threatens Water Availability in the U.S. Great Plains
Presenting author: Kelsey McDonough, Kansas State University, Manhattan, KS (Stacy L. Hutchinson, J.M. Shawn Hutchinson) 1901316

11:20am Long-Term Drought Forecasting Using an Entropy Theory: A Case Study in Texas
Presenting author: Jeongwoo Han, Texas A&M University, College Station, TX (Jeongwoo Han, Vijay P. Singh) 1901480

11:35am Capability of Remote Sensing and In-Situ Drought Indices for Detecting Drought and Streamflow in the MINK Region from 2003-2017
Presenting author: Devon Bandad, Kansas State University, Manhattan, KS (Vahid Rahmani) 1901276

11:50am Quantifying Surface Water and Groundwater Availability in the Brazos River Basin, Texas
Presenting author: Tushar Sinha, Texas A&M University-Kingsville, Kingsville, TX (Hao-Po Chang, Momtahana Habib, Tushar Sinha) 1901679

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338 Measurement and Modeling of Ecosystem Services
Wednesday, July 10, 10:15am-12:15pm
Location: Orleans
Sponsored by: NRES-28; NRES-21; NRES-25
Moderators: Sanjay Shukla, University of Florida, Immokalee, FL; Natasha Bell, Clemson University, Clemson, SC
10:20am A Spatially Explicit Multi-Criteria Decision Analysis Tool for Prioritizing Land Conservation Projects • Presenting author: Anna Linhoss, Mississippi State University, Starkville, MS (Anna Linhoss, Kristine Evans, Sathish Samiappan, Jiandong “Chuck” Liu, Jennifer Roberts, Andrew Shamaskin, Steve Ashby, John Tirpak) 1901825
10:35am Determination of Environmental Flows to Support a Threatened Fish Species of the Great Plains • Presenting author: Lucie Guertault, NC State University, Raleigh, NC (Lucie Guertault, Garey Fox, Shannon Brewer, Mallory Alman) 1900585
10:50am Influences of Climate and Soil Properties on Hydrological Function and Soil Carbon Sequestration under Different Grazing Management Practices • Presenting author: Srinivasulu Ale, Texas A&M AgriLife Research, Vernon, TX (Srinivasulu Ale, JungIn Kim, W Richard Teague) 1901337
11:05am Modelling Greenhouse Gas Emissions from Biosolids-Fertilized Soils Using the DeNitrification and DeComposition (DNDC) Model • Presenting author: Okenna Obi-Njoku, McGill University, Montreal, Quebec Canada (O. Grant Clark, Michael Y. Boh) 1900416
11:20am Performance Comparison of the APSIM and CERES-Wheat Models in Guanzhong Plain, China • Presenting author: Qaisar Saddique, Northwest A&F University, Yangling, Shaanxi China (Qaisar Saddique, Jianmei Ji, Xu Jiutian, Zou Yufeng, Jianqiang He, Huanjie Cai) 1900416
11:35am Porewater Velocity as an Important Factor for Nitrate Removal Rates in Woodchip Bioreactors • Presenting author: Francois Birgand, NC State University, Raleigh, NC (S. Blackman, C. Chen, B.M. Maxwell, F. Birgand) 1901787
11:50am The Spatiotemporal Influence of Urban Development Patterns on Flood Mitigation Ecosystem Services • Presenting author: Kelsey McDonough, Kansas State University, Manhattan, KS (Stacy L. Hutchinson, Jia Liang, Trevor Heffley, Shawn Hutchinson) 1901317

339 Nutrient Transport and Cycling: Modeling
Wednesday, July 10, 10:15am-12:15pm
Location: Hyannis
Sponsored by: NRES-22; NRES-224; NRES-23; NRES-25; NRES-26; NRES-28
Moderators: Rabin Bhattacharai, University of Illinois, Urbana, IL; Jasmeet Lamba, Auburn University, Auburn, AL
10:20am Nitrogen Leaching from Central Valley Irrigated Lands: A Multi-scale Modeling Study • Presenting author: Irael Raij Hoffman, UC Davis, Davis, CA (Thomas Harter, Isaya Kisekka) 1900803
10:35am Development and Application of a Reach-Scale Model to Quantify In-Stream Nutrient Fate in a Karst Agroecosystem Stream with Bedrock Control • Presenting author: Nolan Bunnell, University of Kentucky, Lexington, KY (William Ford, Alex Fogle, Joseph Taraba) 1900853
10:50am Influence of Cover Cropping on Year-Round Measured and Modeled N₂O Emissions • Presenting author: Mary E. Foltz, University of Illinois at Urbana-Champaign, Urbana, IL (Julie Zilles, Sotiria Koloutsou-Vakakis) 1901561
11:05am Comparing a Simple Carbon Nitrogen Model with Complex RZWQM Model • Presenting author: Anupam Bhar, Iowa State University, Ames, IA (Anupam Bhar, Ratnesh Kumar, Robert Malone) 1901394
11:20am Quantification of Nitrate Leaching from Almond Fields in Central Valley of California Using SWAT • Presenting author: Sushant Mehan, Formation Environmental LLC, Sacramento, CA (George Paul, Yohannes Tadesse Yimam, John Dickey, Andrea Schmid, Timothy K. Hartz, Brian Schmid) 1900813
11:35am Testing DRAINMOD-P for Predicting Surface and Subsurface Phosphorus Loss from a Subsurface-Drained Field with Cracking Soil in Northwestern Ohio • Presenting author: Manal Askar, NC State University, Raleigh, NC (Manal H. Askar, Mohamed A. Youssef, George M. Chescheir, Kevin W. King, R. Wayne Skaggs, Ehsan Ghane) 1900693
11:50am A Novel Electrohydraulic Discharge Process for Handling High-Conductivity Wastewaters • Presenting author: Sarah Wu, University of Idaho, Moscow, ID (Sarah Wu, Anilkumar Krosuri) 1901402

345 Sustainability Metrics—Concept, Evaluation, and Advances
Wednesday, July 10, 10:15am-12:15pm
Location: Boylston
Sponsored by: NRES-26; ASE-16
Moderators: Yongping Yuan; USEPA, Research Triangle Park, NC; Veronika Vazhnik, Idaho National Laboratory
10:35am Crafting an Irrigation Sustainability Framework: The case of the Northern High Plains, US • Presenting author: Francisco Munoz-Arriola, University of Nebraska-Lincoln, Lincoln, NE (Francisco Munoz-Arriola, Gengxin Ou, Craig R. Allen, D. Martin, J. Carroll) 1901648
10:50am Application of Input-Output Model in Quantifying the Food-Water-Energy Nexus in the Pacific Northwest • Presenting author: Ganti S Murthy, Oregon State University, Corvallis, OR (Ganti S Murthy) 1901813
11:05am Designing a Sustainable Eco-Efficient Food System: An Integrated Lifecycle and Data Envelopment Approach • Presenting author: Ebenezer Kwoifie, McGill University, Ste Anne-de-
Wednesday, July 10

Belleview, Quebec Canada (John Izhuchukw, Ebenezer Kwofie, Michael Ngadi) 1901737

11:20am  Virtual Water Use in Cassava Propagation and Processing in Southwestern Nigeria  
Presenting author: Temitayo Abayomi Ewemojo, University of Ibadan, Ibadan, Oyo State, Nigeria (Adegoke Ayewowo, Emmanuel Alabi, Temitayo Ewemojo) 1900600

11:35am  Stakeholder Mapping of Controlled Environment Agriculture Utilizing the Technological Innovation System Framework  
Presenting author: Ronald J. Smith, Purdue ABE, West Lafayette, IN (Ronald J. Smith, Robert M. Stwalley III) 1901274

11:50am  Energy Analysis of a Plant-Scale Domestic Solar-Biomass Energy Supply System in Northwest China  
Presenting author: Congguang Zhang, The Ohio State University, Wooster, OH (Congguang Zhang, Jia Cheng, Jiaming Sun, Ling Qiu, Ajay Shah) 1901906

340 PAFS—Plant, Animal and Faculty Systems POSTER SESSION

Wednesday, July 10, 10:15am-12:15pm

Posters will be displayed for the entire session, but authors will be present at posters as follows:

10:15am-11:15am, authors with ODD numbered posters present
11:15am-12:15PM, authors with EVEN numbered posters present

Location: Gloucester
Sponsored by: PAFS
Moderator: Tim Shepherd, Iowa State University, Ames, IA

1 Swine Production across the North Carolina Landscape  
Presenting author: Amanda Dean (Amanda Dean, Natalie Nelson, Lingjuan Wang-Li, Praveen Kolar, Ralph Noble, Edgar Oviedo-Rondon, Mahmoud Sharara) 1901974

3 Identifying Hotspots of Future Animal Climate Change Needs in the U.S.  

4 Analyzing the Post-WWII History of U.S. Animal Agriculture to Predict Future Production Trends  

5 Comparative Analysis of U.S. and Chinese Swine and Poultry Production Systems  
Presenting author: Elise Laudenslager (Elise Laudenslager, Lingjuan Wang-Li, Natalie Nelson, Praveen Kolar, Ralph Noble, Edgar Oviedo-Rondon, Mahmoud Sharara) 1901978

6 How do Environmental Conditions in Poultry Barns impact Poultry Performance?  
Presenting author: Gail Murray (Gail Murray, Lingjuan Wang-Li, Edgar Oviedo-Rondon, Praveen Kolar, Natalie Nelson, Ralph Noble, Mahmoud Sharara) 1901973

7 Analysis and Interpretation for Agricultural Wastewater Treatment Data  
Presenting author: Jasmine Gibson (Jasmine Gibson, Praveen Kolar, Mahmoud Sharara, Natalie Nelson, Ralph Noble, Edgar Oviedo-Rondon, Lingjuan Wang-Li) 1901977

8 Portion Type Seed Selection Device  
Presenting author: Yang Yu, China Agricultural University, Beijing China (Weishuai Liu, Binbin Zhu, Yang Yu) 1901609

9 Improving the Flow of Cohesive Powders Using Portable Flow Aids  
Presenting author: Karthik Salish, Purdue University, West Lafayette, IN (Karthik Salish, Kingsly Ambrose) 1900606

10 The Method Cooperating Multi-Factors to Evaluation the Commercial Value of Cotton in Saw-Gin Processes  
Presenting author: Wanhua Zhou, Anhui University of Finance and Economics, Anhui China (Wanhua Zhou, Hao Li, Houjun Liang, Shoudong Xu, Dengfei Jie) 1900213

11 The Quantitative Detection of Botanical Impurities Contained in Seed Cotton with Near Infrared Spectroscopy Method  
Presenting author: Wanhua Zhou, Anhui University of Finance and Economics, Bengbu Anhui Province, China (Wanhua Zhou, Hao Li, Shoudong Xu, Houjun Liang, Congji Liu, Dengfei Jie) 1900401

12 The Research of the Color-Level Inspection Equipment of Seed Cotton  
Presenting author: Xu Shoudong, Anhui University of Finance and Economics, Bengbu China (Shoudong Xu, Yijin Leng, Guoxin Wu) 1900400

13 Supplying Water Warmed by Exhaust Heat from Closed Vertical Contouring Facility for Dairy Cows Part 2—Effect of Supplying Warmed Water on Milk Production  
Presenting author: Yoichiro Kojima, CARC NARO, Nasushiobara, Tochigi, Japan (Ryoh Nakakubo, Mitsuyoshi Ishida, Yoshiyuki Abe) 1900281

14 The Effect of Pen Surface Amendments for Reducing Greenhouse Gas Emission from Beef Feedlots  
Presenting author: Bryan Woodbury, USDA-ARS, Clay Center, NE (Bryan L. Woodbury, Mindy J. Spiehs, David B. Parker) 1901904

15 Mechanistic Modeling of Ammonia Emission from Laying Hen Manure on a Laboratory-Scale Manure Belt  
Presenting author: Lingying Zhao, The Ohio State University, Columbus, OH (Xinjie Tong, Lingying Zhao, Albert Heber, Ji-Qin Ni) 1901332

16 Effect of Storage Periods on Concentration of Odor Compounds in Deep Pit Slurry  
Presenting author: Min-Woong Jung, Rural Development Administration National Institute of Animal Science, Jeollabuk-Do, Rep.Of Korea (MinWoong Jung, YuNa Jung, DeugWoo Han, GwangGon Jo) 1900897

17 Automatic Vaccine Injection System for Grass Carp  
Presenting author: Junyang Chen, Zhejiang University, Hangzhou, Zhejiang, China (Jinyang Chen, Jianping Li, Dongdong Li, Songming Zhu) 1900340

18 Calibration of an Automated System to Deliver Biologics to Channel Catfish (Ictalurus punctatus) in Commercial Catfish Production Systems  
Presenting author: Wes Lowe, Mississippi State University, Mississippi State, MS (Ganesh Bora, Daniel Chesser Jr, Joseph Purswell, David Wise) 1901375

19 Liquid Desiccant Climate Control System for Greenhouses Based upon Diurnal Changes in Ambient Temperature and Humidity  
Presenting author: Ryan Lefers, King Abdullah University of Science and Technology, Thuwal, Makka, Saudi Arabia (TorOve Leiknes) 1901586

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20  Study on the Adhesion Characteristics of Particulate Matter on Greenhouse Permeable Materials  · Presenting author: Eunmi Hong, Kangwon National University, Gangwondo, Korea (Won Choi, Seung-Jae Lee, Jae-Han Lee) 1901604

21  Design of the Chassis Copying Device for the Greenhouse Self-Propelled Car  · Presenting author: Yaohui Zhang, China Agricultural University, Beijing China (Binbin Zhu, Yang Yu, Jiannong Song, Jicheng Wang, Cailing Liu, Xiangqian Dong, Weishuai Liu, Chao Zhang) 1901734

22  Robotic Gantry for Automated Imaging, Sensing, Crop Input Application, and High-Throughput Analysis  · Presenting author: Alex Drozda, University of Nebraska-Lincoln, Lincoln, NE (Santosh Pitla, Harkamal Wala, Yufeng Ge, Pranav Palli) 1900589

23  Study on Assistant Pollination of Facility Tomato by Unmanned Aerial Vehicle  · Presenting author: Qiang Shi, Jiangsu University, Zhenjiang, Jiangsu Province, China (Qiang Shi, Hanping Mao, Xiaojie Yan, Qiang Zhang, Laurie Connor, Nicolas Jaehan Lee) 1900656

24  Carbon Footprints and Sustainable Agriculture under Environmental Conditions of Prince Edward Island  · Presenting author: Rimsha Khan, University of Prince Edward Island, Charlottetown, P.E.I Canada (Rimsha Khan, Aitzaz Faroqee, Carolyn Brown, Bishnu Acharya, Qamar Zaman) 1900484

25  Improving the Efficiency of a Fan-and-Pad Evaporative Cooling System in Humid Climates Using a Liquid Desiccant  · Presenting author: Waleed Bin Masoud, University of Florida, Gainesville, FL (Melanie Correll, Xin Zhao, Wendell Porter, Herbert Ingley, Ray Bucklin) 1901542

26  Effect on Yield Increase and Energy Saving in Partial Heating for High-Bed Strawberries by Using an Air to Water Heat Pump  · Presenting author: Jongpil Moon, Protected Horticulture Research Institute, Hamangun, Gyeonggido, Republic of Korea (Jongpil Moon, Jinkyung Kwon, Seunghee Kim, YounKoo Kang, Seokho Park, Inho Moon) 1900555

27  Leafy Greens Grown under Variable Nutrient Solutions Using Nutrient Film Technique  · Presenting author: Sarah Van Brunt, Clemson University, Clemson, SC (Sarah Van Brunt, Jeffrey Adelberg, Tom Owino) 1901617

28  Infrared Proximity Measurement System Development and Validation for Classifying Sow Posture  · Presenting author: Benjamin Smith, Iowa State University, Ames, IA (Brett Ramirez, Steven Hoff) 1900327

29  A 2D Stick Model for Simulation of Sow Walking  · Presenting author: Xiaojie Yan, University of Manitoba, Winnipeg, Manitoba, Canada (Xiaojie Yan, Qiang Zhang, Laurie Connor, Nicolas Devillers, Kristopher Dick) 1900589

30  Development of Vocal Recording and Analysis System for laying Hens Based-On Cloud-Computing  · Presenting author: Dae-Hyun Jung, KIST/Seoul National University, Gangleung, Gangwon South Korea (Dae-Hyun Jung, Soo Hyun Park, Unseok Lee, Hyung Seok Kim) 1900952

31  Sensor-Based Automatic Retractable Cattle Shades  · Presenting author: John K. Schueller, University of Florida, Gainesville, FL (John K. Schueller, Ray Bucklin, Lixi Zhang, Vinay Vijayakumar, Jonathan Chiputula, Emmanuel Ajaye, Waleed Bin Masoud) 1900228

32  Development of a Mobile App to Improve Farmer Access to Poultry Housing Decision Tools and to Maintain Records of Use  · Presenting author: Kelly Griggs, Auburn University, Auburn, AL (Jesse Campbell, Jeremiah Davis, Dennis Brothers, Jonas Bowersock, June Shin) 1901182

341 Bioprocess Modeling, Sustainability and Technoeconomic Analysis

Wednesday, July 10, 10:15am-12:15pm
Location: Columbus I
Sponsored by: PRS-280; ES-220
Moderator: Sammy Sadaka, University of Arkansas, Little Rock, AR

10:20am  Kinetic Modeling of Organic Acid Inhibition and Exchange in Genetically Engineered Microbial Consortia  · Presenting author: Ashley Beck, North Carolina State University, Raleigh, NC (Ross Carlson) 1901320

10:35am  Model Predictive Control of Cellulose Hydrolysis  · Presenting author: Ganti S Murthy, Oregon State University, Corvallis, OR (Ganti S Murthy, Haider J Kadhum) 1901461

11:05am  Techno-Economic Analysis of a Combined Anaerobic Digestion and Hydrothermal Carbonization System for Sewage Sludge Processing  · Presenting author: Luis Hueso, The Ohio State University, Wooster, OH (Luis Hueso, Ajay Shah) 1901202

12:00pm  Techno-Economic Analysis of Butanol Production from Sweetpotatoes: Impacts of Feedstock Properties and Post-Harvest Processing on Production Costs  · Presenting author: Ana Zuleta-Correa, North Carolina State University, Raleigh, NC (Ana Zuleta-Correa, Kelly D. Zering, Jose M. Bruno-Barcena, Mari S. Chinn) 1901488

12:35pm  Techno-Economic Analysis of Pennycress Conversion to Aviation Biofuel  · Presenting author: Seyed Hashem Mousavi Avval, The Ohio State University, Wooster, OH (Ajay Shah) 1901656

11:50am  Hybrid Modeling and Optimization of Agrobacterium Fermentation Process  · Presenting author: Dengfeng Liu, Jiangnan University, Wuxi, Jiangsu, China (Dengfeng Liu, Yuqian Shao, Yuan Zong, Yi-an Liu) 1900548

11:05am  Techno-Economic Analysis of a Combined Anaerobic Digestion and Hydrothermal Carbonization System for Sewage Sludge Processing  · Presenting author: Luis Hueso, The Ohio State University, Wooster, OH (Luis Hueso, Ajay Shah) 1901202


11:35am  Techno-Economic Analysis of Pennycress Conversion to Aviation Biofuel  · Presenting author: Seyed Hashem Mousavi Avval, The Ohio State University, Wooster, OH (Ajay Shah) 1901656

11:50am  Life Cycle Assessment of Biochar and Hydrochar Production from Anaerobic Digestion Effluent and Land Application  · Presenting author: Juliana Vasco-Correa, Department of Food, Agricultural and Biological Engineering, The Ohio State University, Wooster, OH (Juliana Vasco-Correa, Ajay Shah) 1900808

12:05pm  Techno-Economic Analysis of Co-Hydrothermal Carbonization of a Coal-Miscanthus Blend  · Presenting author: Kyle McGaughy, Ohio University, Athens, OH (Akbar Saba, Kyle McGaughy, M. Toufiq Reza) 1900905
Wednesday, July 10

342 System Approach to Develop Sustainable Food and Organic Wastes/Byproducts Management Solutions
Wednesday, July 10, 10:15am-12:15pm
Location: Columbus II
Sponsored by: PRS-707
Moderator: Sarah Wu, University of Idaho, Moscow, ID

10:20am Integrated Anaerobic Digestion and Hydrothermal Carbonization (IAD-HTC) System for Food and Yard Waste
Presenting author: Juliana Vasco-Correa, Department of Food, Agricultural and Biological Engineering, The Ohio State University, Wooster, OH (Juliana Vasco-Correa, Ajay Shah) 1900810

10:35am Hydrothermal Liquefaction Value-Added Products and Compost Applications for Plant and Environmental Enhancement
Presenting author: Hengameh Bayat, New Mexico State University, Las Cruces, NM (Emily F. Creegan, Hengameh Bayat, Ryan Zowada, Umakanta Jena, Catherine E. Brewer, Robert Flynn) 1900636

10:50am Valorization of Almond Co-Products Using Black Soldier Fly Larvae
Presenting author: Jean VanderGheynst, UC Davis, Davis, CA (Lydia Palma, Jesus Fernandez-Bayo, Feriesca Putri) 1901254

11:05am A Food-Energy-Water Nexus Solution to Sustainably Manage Organic Wastes
Presenting author: Wei Liao, Michigan State University, East Lansing, MI (Wei Liao) 1901633

343 Publishing in the ASABE Journals: Navigating the Publishing Process and the Future of the Journals — PANEL
Wednesday, July 10, 10:15am-12:15pm
Location: St. Botolph
Sponsored by: ASABE
Moderator: Garey Fox, Editor-in-Chief of ASABE Journals, North Carolina State University, Raleigh, NC
Panelists: Joe Walker, ASABE Director of Publications; Kasiviswanath Muthukumarappan, South Dakota State University and Community Editor, Energy Systems; Deepak Keshwani, University of Nebraska and Community Editor, Education, Outreach, and Professional Development (EOPD)
Meet the Editor-in-Chief, Director of Publications, and several of the Community Editors; learn about new initiatives and directions for the ASABE journals; learn how to navigate the publication process; hear best tips and tricks for getting your articles published; share your thoughts and input on the future direction of the ASABE journals.

344 Autonomous Field Equipment—The Future of Standardization
Wednesday, July 10, 2:30pm-6:30pm
Location: Suffolk
Sponsored by: MS
Moderator: Jean Walsh, ASABE Standards, St. Joseph, MI
Cost: $30 Attendees/$10 Students

2:45pm State of Automation in Agricultural Equipment
Presenting author: J. Alex Thomasson, Texas A&M University, College Station, TX; Professor Craig Baillie, University of Southern Queensland, Toowoomba, Queensland, Australia 1901995

4:00pm The AEF Automation Project
Presenting author: Norbert Schlingmann, Agricultural Electronics Foundation (AEF), Frankfurt, Germany 1901996
Committees to Convene

All meetings take place at the Marriott Copley Place. Subject to change. As of May 31, 2019.

EXECUTIVE

ASABE Board of Trustees
Sunday, July 7 10:30am-1:30pm
Location: Regis

ASABE Board of Trustees
Thursday, July 11 10:30am-3:00pm
Location: Wellesley

E-02 Constitution and Bylaws
not meeting

E-05 Marketing and External Communications
Wednesday, July 10 2:30pm-5:00pm
Location: Hyannis

E-05/1 E-Week Coordinating Committee
Tuesday, July 9, 12:30pm-2:15pm
Location: Hyannis

E-05/2 FFA Coordinating Committee
Tuesday, July 9, 12:30pm-2:15pm
Location: Boylston

E-05/3 Digital Strategy
Monday, July 8, 12:15pm-2:15pm
Location: MIT

E-06 Foundation Liaison Committee
not meeting

E-06/1 KEYS Fund Management Committee
not meeting

E-06/2 Giving Back Fund
not meeting

E-07 Issues Management & Social Action
Monday, July 8, 6:30am-7:30am
Location: MIT

E-08 Fellows
Monday, July 8, 12:15pm-2:15pm
Location: Harvard

E-20 Finance
Sunday, July 7 9:00am-10:00am
Location: MIT

E-20 Initiative Fund Evaluation Subcommittee
not meeting

Editor in Chief Oversight Committee
Sunday, July 7 5:00pm-5:45pm
Location: Provincetown

Foundation Mission/Vision Subcommittee 2019
not meeting

Nominating Committee
Monday, July 8, 11:00am-2:30pm
Location: St. Botolph

Nominating Committee
Wednesday, July 10 9:00am-12:00pm
Location: Regis

Strategic Partnering Task Force of BOT
Sunday, July 7 3:30pm-5:30pm
Location: Regis

MEETINGS COUNCIL

Meetings Council
Sunday, July 7 1:30pm-3:30pm
Location: Harvard

Meetings Council
Thursday, July 11 8:00am-10:00am
Location: Yarmouth

Community Program Chairs
Wednesday, July 10 5:00pm-6:30pm
Location: Regis

MEMBERSHIP DEVELOPMENT COUNCIL

Membership Development Council
Sunday, July 7 1:30pm-3:30pm
Location: MIT

Membership Development Council
Thursday, July 11 8:00am-10:00am
Location: Orleans

Values Growth Committee
Sunday, July 7 3:30pm-4:30pm
Location: MIT

M-102 Awards Coordinating
Tuesday, July 9, 8:00am-9:15am
Location: Boylston

M-111 John Deere/McCormick-Case Gold Medal
not meeting

M-112 Massey-Ferguson Gold Medal
not meeting

M-113 Engineering Concept of the Year
not meeting

M-114 Young Researcher (New Holland)
not meeting

M-115 Young Educator (A.W. Farrall)
not meeting

M-116 Young Designer (Sunkist)
not meeting

M-117 Larry W. Turner Young Extension Professional
not meeting

M-122 Stewart Engineering Humanities
not meeting

M-130 Sukup Global Food Security Award
not meeting

M-131 Fellows Screening
not meeting
M-132 Lalit & Aruna Verma Excellence in Global Engagement
not meeting
M-151 Henry Giese Structures & Environment
not meeting
M-152 ADS/Hancor Soil & Water Engineering
not meeting
M-154 International Food Engineering Award
not meeting
M-155 Gunlogson Countryside Engineering
not meeting
M-156 Kishida International
not meeting
M-157 SMV Technologies Ergonomics, Safety and Health
not meeting
M-158 Mayfield Cotton Engineering
not meeting
M-159 Award for the Advancement of Surface Irrigation
not meeting
M-160 Evelyn E. Rosentreter Standards Award
not meeting
M-161 PEI Professional Engineer of the Year
not meeting
M-162 Heermann Sprinkler Irrigation Award
not meeting
M-163 Gale A. Holloway Professional Development Award
not meeting
M-164 Yoerger Preprofessional Engineer of the Year Award
not meeting
M-166 James R. and Karen A. Gilley Academic Leadership Award
not meeting
M-167 Netafim Award for the Advancements in Microirrigation
not meeting
M-170 Historic Commemoration
Monday, July 8, 6:30am-7:30am
Location: Brandeis

INTERNATIONAL

E-2050 Global Engagement
Monday, July 8, 12:15pm-1:15pm
Location: Yarmouth
E-2050 Executive Committee for Global Engagement
Monday, July 8, 12:15pm-1:15pm
Location: Yarmouth
E-2050/1 International Member Support
not meeting
E-2050/2 International Membership Community Support
not meeting

STUDENT ORGANIZATIONS & AWARDS

P-120 Student Organizations
Tuesday, July 9, 8:00am-9:15am
Location: Tufts
P-121 G.B. Gunlogson Student Environ Design Competition
Monday, July 8, 7:00pm-9:00pm
Location: Harvard
P-122 Boyd-Scott Graduate Research Award
not meeting
P-123 K.K. Barnes Student Paper Competition
Tuesday, July 9, 1:00pm-2:00pm
Location: Tufts
P-124 AGCO National Student Design Competition
not meeting
P-126 1/4 Scale Tractor Design Competition
not meeting
P-127 Robotics Student Design Competition
not meeting
P-128 Engineering Ethics Competition Committee
not meeting
P-129 Student Oral/Poster Presentation Competition Committee
not meeting

PUBLICATIONS COUNCIL

Publications Council
Sunday, July 7 1:30pm-3:30pm
Location: Northeastern
Publications Council
Thursday, July 11 8:00am-10:00am
Location: Hyannis
P-511 Journal Editorial Board
Tuesday, July 9, 7:00pm-8:30pm
Location: Vineyard
P-513 Resource Editorial Board
Tuesday, July 9, 1:00pm-2:30pm
Location: Vineyard
P-515 Textbooks and Monographs
Tuesday, July 9, 8:00am-9:30am
Location: Hyannis

STANDARDS & TECHNICAL COUNCIL

Standards & Technical Council
Sunday, July 7 1:30pm-3:30pm
Location: Brandeis
<table>
<thead>
<tr>
<th>Standards &amp; Technical Council</th>
<th>STC-01 Standards Policy &amp; Procedures</th>
<th>STC-02 International Standardization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, July 11 8:00am-10:00am</td>
<td>not meeting</td>
<td>not meeting</td>
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<tr>
<td>Location: Vineyard</td>
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**APPLIED SCIENCE & ENGINEERING**

<table>
<thead>
<tr>
<th>ASE-01 Applied Science and Engineering Executive</th>
<th>ASE-05 Publications</th>
<th>ASE-09 Environmental Quality Coordinating Committee</th>
<th>ASE-12 Forest Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>not meeting</td>
<td>not meeting</td>
<td>not meeting</td>
<td>Tuesday, July 9, 5:15pm-7:00pm</td>
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<tr>
<td>Location: Boylston</td>
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<td>Location: Boylston</td>
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<tr>
<th>ASE-134 US TAG to ISO TC 134 Fertilizers &amp; Soil Conditioners</th>
<th>ASE-16 Engineering for Sustainability</th>
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<tbody>
<tr>
<td>not meeting</td>
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<tr>
<td>Location: Boylston</td>
<td>Location: Boylston</td>
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**EDUCATION, OUTREACH & PROFESSIONAL DEVELOPMENT**

<table>
<thead>
<tr>
<th>EOPD-01 Executive/Steering</th>
<th>EOPD-04 Refereed Publications Review and Paper Awards</th>
<th>EOPD-203 Undergraduate &amp; Graduate Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday, July 10 6:00am-7:30am</td>
<td>not meeting</td>
<td>Tuesday, July 9, 5:15pm-7:00pm</td>
</tr>
<tr>
<td>Location: Boston University</td>
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<td>Location: Salon I</td>
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<tr>
<th>EOPD-204 Engineering &amp; Technology Accreditation</th>
<th>EOPD-205 Engineering Technology &amp; Management Education</th>
<th>EOPD-206 Ag Technology &amp; Mgmt Curriculum Review &amp; Pgm Recog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday, July 9 7:30 AM - 9:15AM</td>
<td>Monday, July 8, 12:15pm-2:15pm</td>
<td>Monday, July 8, 12:15pm-2:15pm</td>
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<tr>
<td>Location: Northeastern</td>
<td>Location: Salon J</td>
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<thead>
<tr>
<th>EOPD-208 Extension</th>
<th>EOPD-210 Academic Program Administrators</th>
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<tbody>
<tr>
<td>Tuesday, July 9, 5:15pm-7:00pm</td>
<td>Monday, July 8, 5:00pm-5:45pm</td>
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<tr>
<td>Location: Columbus 1</td>
<td>Location: Salon J</td>
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**ENERGY SYSTEMS**

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<tr>
<td>Monday, July 8, 5:15pm-7:00pm</td>
<td>Monday, July 8, 5:15pm-7:00pm</td>
<td>Monday, July 8, 6:30am-7:30am</td>
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<tr>
<td>Location: Brandeis</td>
<td>Location: Brandeis</td>
<td>Location: Harvard</td>
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<tr>
<td>Tuesday, July 9, 8:00am-9:15am</td>
<td>Tuesday, July 9, 5:15pm-7:00pm</td>
<td>Tuesday, July 9, 7:00am-8:00am</td>
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<tr>
<td>Location: Boston University</td>
<td>Location: Columbus II</td>
<td>Location: Salon K</td>
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<tr>
<td>not meeting</td>
<td>not meeting</td>
<td>Tuesday, July 9, 12:30pm-2:30pm</td>
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<tr>
<td>ES-310 Ag Lighting Group</td>
<td>not meeting</td>
<td>Location: Boston University</td>
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<tbody>
<tr>
<td>Wednesday, July 10 2:45pm-5:00pm</td>
<td>not meeting</td>
<td>not meeting</td>
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<tr>
<td>Location: Brandeis</td>
<td></td>
<td>ES-400 Electrical Code for Agriculture</td>
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<td>not meeting</td>
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**ERGONOMICS, SAFETY & HEALTH**

<table>
<thead>
<tr>
<th>ESH-01 Ergonomics, Safety, and Health Executive/Oversight</th>
<th>ESH-02 ESH Policy and Forward Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>not meeting</td>
<td>Wednesday, July 10 8:00am-9:30am</td>
</tr>
<tr>
<td>Location: Wellesley</td>
<td>Location: Wellesley</td>
</tr>
</tbody>
</table>
ESH-03 Ergonomics, Safety, and Health Standards Oversight
  Tuesday, July 9, 12:30pm-2:30pm
  Location: Suffolk

ESH-03/1 External Standard Development
  Tuesday, July 9, 12:30pm-2:30pm
  Location: Suffolk

ESH-03/2 Internal Standard Development
  Tuesday, July 9, 12:30pm-2:30pm
  Location: Suffolk

ESH-04 Technology Exchange
  Tuesday, July 9, 8:00am-9:15am
  Location: MIT

ESH-04/1 Journal of Agricultural Safety and Health
  Tuesday, July 9, 8:00am-9:15am
  Location: MIT

ESH-04/2 Farmers With Disabilities Technology Exchange
  Tuesday, July 9, 8:00am-9:15am
  Location: MIT

ESH-05 Nominations
  not meeting

INFORMATION TECHNOLOGY, SENSORS & CONTROL SYSTEMS
ITSC-01 ITSC Executive
  Sunday, July 7 3:30pm-5:30pm
  Location: Wellesley

ITSC-02 ITSC Steering
  Wednesday, July 10 2:45pm-5:00pm
  Location: Yarmouth

ITSC-04 Publications Review and Paper Awards
  Tuesday, July 9, 7:00am-8:00am
  Location: Harvard

ITSC-06 Programs
  not meeting

ITSC-217 Computational Methods, Simulations & Applications
  Tuesday, July 9, 5:15pm-7:00pm
  Location: Salon K

ITSC-230 Biosensors
  Monday, July 8, 12:15pm-2:15pm
  Location: Tufts

ITSC-254 Emerging Information Systems
  Tuesday, July 9, 12:30pm-2:30pm
  Location: MIT

ITSC-312 Machine Vision
  Tuesday, July 9, 8:00am-9:15am
  Location: Harvard

ITSC-318 Mechatronics & Biorobotics
  Tuesday, July 9, 7:00pm-9:00pm
  Location: Salon K

ITSC-348 Electromagnetics & Spectroscopy
  Monday, July 8, 5:15pm-7:00pm
  Location: Northeastern

ITSC-353 Instrumentation & Controls
  Monday, July 8, 7:00pm-9:00pm
  Location: Northeastern

MACHINERY SYSTEMS
MS-01 Machinery Systems Executive
  Sunday, July 7 6:00pm-8:00pm
  Location: Suffolk

MS-01 Machinery Systems Executive
  Wednesday, July 10 7:00am-8:00AM
  Location: Wellesley

MS-02 Machinery Systems Steering
  Sunday, July 7 6:00pm-8:00pm
  Location: Suffolk

MS-02 Machinery Systems Steering
  Wednesday, July 10 7:00am-8:00am
  Location: Wellesley

MS-03 Machinery Systems Standards Oversight
  Wednesday, July 10 8:00pm-10:00pm
  Location: Suffolk

MS-03/2 Farm Materials Handling and Transport
  not meeting

MS-04 Publications Review
  Tuesday, July 9, 7:00am-8:00am
  Location: Brandeis

MS-05 Nominating
  not meeting

MS-23 & US TAG ISO/TC23
  Wednesday, July 10 6:30pm-8:00pm
  Location: Suffolk

MS-23/14 Ag Mach.—Sym., Disp & Man & US TAG ISO TC23/SC14
  Monday, July 8, 7:00am-8:00am
  Location: Suffolk

MS-23/19 Ag Electronics & US TAG ISO TC23/SC19
  Tuesday, July 9, 2:30pm-4:30pm
  Location: Wellesley

MS-23/19/1 Electronics for Mobile Equipment (ISOBUS)
  not meeting

MS-23/19/3 Electronics for Identification (Animal)
  not meeting

MS-23/19/5 Standards for Wireless Communications in Agr.
  not meeting

MS-23/19/8 ISO 25119 Parts 1-4 revision
  not meeting

MS-23/2 Ag Mach.—Common Tests & US TAG ISO TC23/SC2
  Monday, July 8, 2:00pm-3:00pm
  Location: Suffolk
**MS-23/2/1 Environment Within Ag Vehicle Enclosures**  
Monday, July 8, 1:00pm-2:00pm  
Location: Suffolk

**MS-23/2/2 ATSC ROPS Subcommittee**  
Monday, July 8, 10:00am-11:00am  
Location: Suffolk

**MS-23/3 Ag Mach.—Operator Comfort & US TAG ISO TC23/SC3**  
Tuesday, July 9, 10:30am-12:30pm  
Location: Suffolk

**MS-23/4 Tractors and US TAG ISO TC23/SC4**  
Wednesday, July 10 10:00am-12:30pm  
Location: Suffolk

**MS-23/4/1 Agricultural Equipment Braking**  
Tuesday, July 9, 2:30pm-4:30pm  
Location: Suffolk

**MS-23/4/2 Agricultural Loaders**  
not meeting

**MS-23/4/3 Lighting & Marking**  
Monday, July 8, 3:30pm-5:30pm  
Location: Suffolk

**MS-23/4/4 Tractor & Implement Hydraulics**  
Tuesday, July 9, 7:00am-8:00am  
Location: Wellesley

**MS-23/4/5 Tractor Implement Interface/PTO**  
Tuesday, July 9, 8:00am-10:00am  
Location: Wellesley

**MS-23/6 Application Sys & US TAG ISO TC23/SC6**  
Tuesday, July 9, 4:30pm-6:30pm  
Location: Suffolk

**MS-23/6/1 Liquid Materials Application**  
Monday, July 8, 5:30pm-7:30pm  
Location: Suffolk

**MS-23/6/2 Aviation**  
Tuesday, July 9, 1:00pm-2:30pm  
Location: Wellesley

**MS-23/6/3 Dry Materials**  
Monday, July 8, 11:30am-1:00pm  
Location: Wellesley

**MS-23/6/4 Spray Application Modeling**  
Sunday, July 7 1:00pm-3:00pm  
Location: Wellesley

**MS-23/6/5 Anhydrous Ammonia Application Equipment**  
Monday, July 8, 1:00pm-3:00pm  
Location: Wellesley

**MS-23/7 Harvest and US TAG ISO TC23/SC7**  
Tuesday, July 9, 4:30pm-6:30pm  
Location: Wellesley

**MS-23/7/1 Grain Harvesting**  
not meeting

**MS-23/7/2 Forage & Biomass Engineering**  
Monday, July 8, 5:30pm-7:30pm  
Location: Wellesley

**MS-23/7/3 Cotton Engineering**  
Monday, July 8, 11:00am-1:00pm  
Location: Suffolk

**MS-45 Soil-Plant-Machine Dynamics**  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Tremont

**MS-47 Distinguished Lecture Series**  
not meeting

**MS-48 Specialty Crop Engineering**  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Northeaster

**MS-49 Crop Production Systems, Machinery, and Logistics**  
Tuesday, July 9, 7:00am-8:00am  
Location: Suffolk

**MS-54 Precision Agriculture**  
Tuesday, July 9, 9:00am-10:30am  
Location: Suffolk

**MS-58 Agricultural Equipment Automation**  
Monday, July 8, 9:30am-11:30am  
Location: Wellesley

**MS-60 Unmanned Aerial Systems**  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Tufts

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**NATURAL RESOURCES & ENVIRONMENTAL SYSTEMS**

**NRES-01 NRES Executive**  
Sunday, July 7 3:30pm-5:30pm  
Location: Harvard

**NRES-02 NRES Steering**  
Wednesday, July 10 2:45pm-5:00pm  
Location: Nantucket

**NRES-03 NRES Standards Oversight**  
not meeting

**NRES-03/2 US TAG for ISO TC23/SC18**  
not meeting

**NRES-04 Program**  
Sunday, July 7 3:30pm-5:30pm  
Location: Harvard

**NRES-05 Publications Review**  
not meeting

**NRES-06 Paper Awards**  
not meeting

**NRES-07 Nomenclature**  
not meeting

**NRES-09 Forward Planning**  
Sunday, July 7 3:30pm-5:30pm  
Location: Harvard

**NRES-21 Hydrology Group**  
Tuesday, July 9, 8:00am-9:15am  
Location: Nantucket
NRES-22 Erosion Control Group  
Tuesday, July 9, 12:30pm-2:30pm  
Location: Berkeley

NRES-223 Erosion Control Research  
Tuesday, July 9, 12:30pm-2:30pm  
Location: Berkeley

NRES-224 Sediment and Associated Pollutants  
Tuesday, July 9, 12:30pm-2:30pm  
Location: Berkeley

NRES-225 Conservation Systems  
Tuesday, July 9, 12:30pm-2:30pm  
Location: Berkeley

NRES-23 Drainage Group  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Vineyard

NRES-24 Irrigation Group  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Berkeley

NRES-241 Sprinkler Irrigation  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Berkeley

NRES-242 Surface Irrigation & Water Supply  
not meeting

NRES-244 Irrigation Management  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Berkeley

NRES-245 Microirrigation  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Berkeley

NRES-246 Turf & Landscape Irrigation  
Tuesday, July 9, 7:00pm-9:00pm  
Location: Berkeley

NRES-25 Streams, Reservoirs, and Wetlands Group  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Provincetown

NRES-251 Hydraulic Structures  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Provincetown

NRES-252 Geomorphogy, Streambk Stblty & In-Stream Processes  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Provincetown

NRES-253 Riparian Zones, Floodplains, & Wetlands  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Provincetown

NRES-26 Sustainable Land Resources  
Monday, July 8, 1:15pm-2:15pm  
Location: Salon I

NRES-262 Home Sewage Disposal  
not meeting

NRES-265 Soil and Groundwater Remediation  
not meeting

NRES-27 Ag By-products & Animal Mortality Management Systems  
Tuesday, July 9, 12:30pm-2:30pm  
Location: Nantucket

NRES-28 Ecological Engineering  
Tuesday, July 9, 8:00am-9:15am  
Location: Provincetown

**PLANT, ANIMAL & FACILITY SYSTEMS**

**PAFS-01 Executive**  
Sunday, July 7 3:30pm-5:30pm  
Location: Brandeis

**PAFS-02 Steering**  
Wednesday, July 10 2:45pm-5:00pm  
Location: Orleans

**PAFS-03 Standards Oversight**  
Wednesday, July 10 10:00am-12:00pm  
Location: Tremont

**PAFS-04 Paper Awards**  
not meeting

**PAFS-05 Publications Review**  
not meeting

**PAFS-06 Program**  
not meeting

**PAFS-07/1 Agri-Industrial Facility Design and Operation**  
Monday, July 8, 12:15pm-2:15pm  
Location: Falmouth

**PAFS-20 Structures Group**  
Tuesday, July 9, 5:15pm-7:00pm  
Location: Hyannis

**PAFS-20/4 Bulk Solids Handling and Storage**  
Monday, July 8, 12:15pm-2:15pm  
Location: Falmouth

**PAFS-234 Fisheries & Aquaculture**  
not meeting

**PAFS-30 Plant Systems Group**  
Tuesday, July 9, 12:15pm-2:15pm  
Location: Falmouth

**PAFS-40 Facilities & Systems Group**  
Monday, July 8, 5:15pm-7:00pm  
Location: Boylston

**PAFS-403/1 Milk Handling Equipment**  
not meeting

**PAFS-50 Environmental Air Quality**  
Tuesday, July 9, 8:00am-9:15am  
Location: Falmouth

**PROCESSING SYSTEMS**

**PRS-01 Processing Systems Executive & Steering**  
Sunday, July 7 3:30pm-5:30pm  
Location: Northeastern

**PRS-01 Processing Systems Executive & Steering**  
Wednesday, July 10 2:45pm-5:00pm  
Location: Falmouth
OTHER COMMITTEES

ABET Outcomes Assessment and Updates—Panel Discussion
Sunday, July 7 1:30pm-3:30pm
Location: Nantucket

AETC Planning Committee
not meeting

NRCS
Tuesday, July 9, 7:00pm-9:00pm
Location: MIT

USDA Agricultural Research Service All-Hands Meeting
Sunday, July 7 6:30pm-8:30pm
Location: MIT

X271 Revision of D271, Psychrometric Data
not meeting

X401 Development Group
not meeting

X475 Storages for Bulk, Fall-Crop Irish Potatoes
not meeting

SDC for X559
not meeting

X621 development
not meeting

X627 Standardized Testing Protocol for Smart Controllers
not meeting

X633 Testing Soil Moisture Sensors for Landscape Irrigation
Tuesday, July 9, 7:00pm-9:00pm
Location: Berkeley

X643 Putting Green and Sports Field Design
not meeting

X653 HVAC for indoor growers
Sunday, July 7 9:00am-4:00pm
Location: Tufts

Young Professionals Community Business Meeting
Tuesday, July 9, 5:15pm-7:00pm
Location: Orleans