



The 2nd Spray Drone End User Conference

February 26-29th, 2024. The Lodge at Gulf State Park, a Hilton Hotel
21196 East Beach Blvd. Gulf Shores, AL 36542

Sessions include technical field demonstrations, regulatory updates, presentations from researchers, equipment manufactures and experienced drone operators, 6 hours of panel discussion and Q&A focusing on regulatory compliance, business operation, fleet management, insurance, liability, marketing, etc., with industry experts in the country

Registration fee: \$350 in person, \$200 remote option (live presentations only)

Sponsorship opportunities available for the event

Presentation recordings available for all registered participants after the conference

Questions? Contact Dr. Steve Li, steveli@auburn.edu

Registration link: <https://www.aces.edu/go/droneconference>

www.aces.edu
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Sponsor list:

Diamond Level:

Agri Spray Drone (<https://agrispraydrones.com>)

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Bronze Level:

American Drone (<https://americandrone.us>)

The 2nd Spray Drone End User Conference

February 26th-29th, 2024. The Lodge at the State Park. 21196 E Beach Blvd, Gulf Shores, AL 36542

US Central Time (UTC -6:00)

February 26th

9am-5pm: Conference registration (outside grand ballroom)

Technical Session 1: Spray Drift Management in Drone Application (grand ballroom)

1pm: Welcome. *Steve Li (Extension Specialist, Associate Professor. Alabama Cooperative Extension System and Auburn University)*

1:15pm-1:40pm: Evaluating Spray Adjuvants for Use in UAV Platforms for Swath, Deposition, Coverage and Drift Reduction. *Dr. Ryan Edwards. (Sr. Research Manager. Land O'Lakes, Inc.)*

Description: UAV applications are a growing market space, and along with that the need to explore adjuvant pairups. Adjuvants, just like with ground rigs, can benefit UAV's in a multitude of spray performance enhancements by adding as a tankmix. Winfield United has been researching which of our proprietary and experimental compounds best suits this platform space and what recommendations on product selection and rates would be recommended to the grower. Between canopy penetration, swath width, drift reduction, coverage - not all adjuvants are the same, and some perform better than others.

1:40pm-2:05pm: Spray Drift from Remotely Piloted Aerial Application Systems. *Dr. Dan Martin. (Research Engineer. USDA-ARS Aerial Application Technology Research Unit).*

Description: Spray drones are increasingly being purchased and used by farmers and contractors in the US. While the technology has been readily available in the US for the last several years, there are still challenges to rapid adoption of this emerging technology, but also many benefits that may offset those challenges. One of those challenges is understanding how these new spray platforms compare to conventional aerial and ground application systems. In this presentation, he will discuss some of the spray drift studies he and his team have conducted, along with the results from those studies. Drift data like these are important pieces to the puzzle so that regulatory agencies such as the EPA and PMRA have the tools needed to guide this emerging industry forward while continuing to protect our valuable environmental resources.

2:05pm-2:30pm: Long Tail Chemical Drift Liability. *Vaughn Tolbert (Owner, VT Insurance Agency)*

Description: This discussion will focus on the Chemical Liability part of the insurance policy. The reason it is called "long tail" is because they can take a long time to handle. I will discuss how much chemical limit the industry can offer for drones and how a claims process is handled. We will go through a couple of examples of drift claims from start to finish. These can take up to a year in some cases and the non-chemical limit will likely come into play due to lawsuits. These claims could also be disputed due to changing companies. I will also discuss the difference between drift

coverage and pollution coverage as they are not the same. Drift will always be chemical coming from aircraft while pollution would include spills and other poorly stored chemical that seeps into the ground.

2:30pm-2:55pm: Practical ways to manage drone spray drift. *Dr. Steve Li (Extension Specialist, Associate Professor. Alabama Cooperative Extension System and Auburn University)*

Description: Spray drift is a big concern among drone operators. It can lead to lawsuits, compensations, high insurance premium and damage to the business credibility. Regulatory agencies such as EPA also highly emphasize spray drift and off-target management in today's political environment to protect endangered species and respond to court verdict. In this presentation, I will discuss several practices to mitigate spray drone drift in field operation including wind management, buffer area, proper flight parameter settings, adjuvant, spray volume, etc.

2:55pm-3:10pm: Q&A session for drift management

3:10pm-3:30pm: Coffee Break, Networking and Exhibitor Visit

Technical Session 2: DJI Agras T40 Repair and Troubleshooting Strategies (grand ballroom)

3:30pm-4:30pm. *Taylor Moreland (Owner, Agri Spray Drones)*

Description: The Agras T40 is the most widely used application drone in the US. Learn how to prepare yourself and your T40 for a successful spraying season. We will discuss drone repairs, troubleshooting issues, and improvements to look forward to.

5-6pm. Welcome Reception (Grand ballroom and foyer)

February 27th

7am-8am: Breakfast (grand ball room)

Lunch Presentation: Fertility Insight From a Bird's Eye View. *Scott Deavers (Owner, SouthGen Solutions)*

Description: We know that multispectral imaging of crop canopies can show us things our eyes cannot see regarding crop health, but what exactly is it showing up and what do we do with that information? Let's discuss the process of image stitching through applying as respect to grower fertility management programs.

Regulatory Session (grand ballroom)

8am-8:05am: Open speech. *Sarah Hovinga (Regulatory Policy Analyst, Bayer CropScience), Joel Jones (Commercial UAV Instructor, Orange Coast College CA)*

8:05am-8:25am: Exemptions, Responsibility, and FAA Enforcement. *Ryan Smith (Aviation Safety Inspector, AFS-750 GA and Commercial UAS Branch, Federal Aviation Administration)*

Description: The FAA has seen a significant increase in applicants seeking to use drones for agricultural applications under 14 CFR Part 137. Based on the safety record of existing agricultural drone operations, the FAA streamlined the certification process for certain lower-risk operators. This presentation will discuss the changes to the certification process while being more efficient. This streamlined process allows more operators to use agricultural drones to the full potential while safely integrating them into our national airspace system.

8:25am-8:45am: Regulatory Considerations for Applications of Pesticides with Unmanned Aerial Systems - EPA Update. *Katrina White (Senior Advisor, US Environmental Protection Agency)*

Description: Given where both aviation and pesticide regulations are for pesticide application drones, both on the federal and state levels, there is a need to gather stakeholders to discuss moving towards a pathway of standardization of training and certification for drone operators and pilots. This session will contain presentations and/or proposals for training & certification programs and possible pathways that incorporate both the aviation and pesticide regulatory needs, for example curriculum program and certification development.

8:45am-9:05am: A Regulators Perspective of UAV's Applying Pesticides. *Dwight Seal (District Manager, Association of American Pesticide Control Officials (AAPCO) /North Carolina Department of Agriculture and Consumer Services)*

Description: Since the inception of UAV technology used for the application of pesticides, government and other stakeholders have navigated the rules and regulations of EPA, FAA, and state departments of agriculture. This presentation will discuss the evolution of how the agencies have worked within the existing framework of the current laws and pesticide labels. The future of this technology is changing fast and ideas of where we will be in the coming years will be shared.

9:05am-9:25am: DPR's Emerging Technologies Efforts. *Emily Bryson (Senior Environmental Scientist, California Department of Pesticide Regulation (DPR))*

Description: Emily Bryson founded and chairs the California Department of Pesticide Regulation's (DPR) Emerging Technologies Workgroup (ETW). The ETW is a collaborative effort between academia and various governmental entities to gather information on emerging application technologies, build in-house subject matter expertise on such technologies, share information and contacts, and adeptly inform proposed regulations to ensure feasibility, efficacy, and enforceability if DPR determines such regulations are necessary. Though the ETW is platform agnostic, the group focuses each meeting on a specific type of equipment, including remotely piloted aerial application systems, to discuss the capabilities and limitations of the equipment, potential regulatory hurdles, data gaps (such as data on occupational exposure, non-occupational exposure, efficacy, phytotoxicity, etc.), use patterns and trends in California (when available), and any other information relevant to the equipment and the ETW members.

9:25am-9:45am: Industry Activities and Support for Drones/Unmanned Aerial Spray Systems (UASS). Sarah Hovinga (*Regulatory Policy Analyst, Bayer & CropLife America Drones Working Group (CLA DWG)*), Travis Bui (*Human Safety Policy Manager, Corteva & Unmanned Aerial Pesticide Application System Task Force (UAPASTF)*).

Description: With a focus on off-site movement, operator exposure, and crop residue, the CLA DWG and Global UAPASTF are looking to advocate for drone best practices in the USA and generate needed drone-specific data that can be used around the world, respectively, that helps to address needed information that will eventually facilitate drones being incorporated into regulatory framework(s) for pesticide applications.

9:45am-10am: UAS Application Pilot Training in Schools. Joel Jones (*Commercial UAV Instructor, Orange Coast College CA*)

Description: Given the regulatory climate, it is in the educator's hands to develop a harmonized path for the mass certification required to meet the demands of the growing job market. This can be done in both public and private education, but to be effective training for the students having an accreditation body for UAS applicator standards would easily allow primary training to be completed anywhere in the US and minimal level of training for final certification in each state worked in.

10am-10:30am: Coffee Break and Exhibitor Visit

Breakout room 1: Research Session

10:30am-10:50am: Corn Fungicide Trial Update. Dr. Jason Deveau (*Application technology specialist, Ontario Ministry of Agriculture, Food and Rural Affairs*)

Description: I will reiterate the results from the 2022 corn fungicide trial where we used an Agras T10 to apply fungicides to field corn. In this study we explored the impact of water volume and travel speed on canopy coverage and drift. 2023 had a high incidence of tar spot and which revealed additional information on swath width and efficacy.

10:50am-11:10am: Characterizing Panoramic Wheat Head Coverage and Soybean Canopy Penetration Coverage from Drones. Dr. Jason Deveau (*Application technology specialist, Ontario Ministry of Agriculture, Food and Rural Affairs*)

Description: I will share the results of two studies. In wheat, we compared panoramic wheat head coverage from an Agras T40 to that of a helicopter, and from the same drone at two velocities speeds. In soybean, we compared spray coverage from an Agras T40 at two water volumes to that of a conventional horizontal boom.

11:10-11:30am: Impacts of UASS nozzle selection and flight parameters on swath characteristics with an eye toward applications in fruit and vegetable crops. Dr. Michael Reinke (*Viticulture Specialist, Michigan State University Extension*)

Description: This talk will discuss the differences in percent coverage and droplet density swath maps that result from changes in drone flight height and speed as well as changes in nozzle or droplet size settings. The DJI Agras T30 was used as the primary test platform, but examples from the Agras T10, Agras T40, and the XAG P100 Pro will also be compared. The additional requirements for effective applications in specialty crops will be discussed and will reference results from the swath mapping studies presented.

11:30-11:50am: Accuracy and Uniformity of Spray Drone Applications at Varying Operational Parameters. *Cole Byers (Graduate Research Assistant, University of Georgia)*

Description: Information on accuracy and uniformity within the swath at varying parameters including nozzle types, flight speeds and application heights for different spray drone platforms will be shared. Influence of these operational parameters on effective swath and selection of parameters to attain widest effective swath with acceptable spray deposition uniformity will also be shared.

Breakout room 2: Equipment and Software Session

10:30am-10:50am: DJI Agricultural Drone Updates and Future Expectations. *Wing Zhong (Technology Specialist, DJI Agriculture)*

Description: The session will discuss the existing hurdles in agricultural drone application, recent updates to address these hurdles, and a glimpse into future expectations from this technology in agriculture.

10:50am-11:10am: UAS Application Management Software. *Eric Kubicka (Partner, DroneLogbook)*

Description: Dronelogbook - Agriculture Edition is a UAS Part 137 operational management software. It allows UAS operators to collect, track and organize custom application details performed for their customers. Compliance reporting is also automatically created for regulatory purposes.

11:10-11:30am: Leading Edge Aerial Technologies and the PrecisionVision 40X UAS Aerial Application Systems. *William Reynolds (President, Leading Edge Aerial Technologies Inc.)*

Description: Designed, engineered, and manufactured in Daytona Beach, Florida, USA by Leading Edge Aerial Technologies, Inc. (LEAT), the PrecisionVision 40X (PV40X) is the most versatile and capable UAS aerial application platform available. With four interchangeable payload system options, the PV40X completes any task required for both imagery/LiDAR needs and aerial applications including liquid, granular, and ultra-low volume treatments.

11:30-11:50am: Swathing with strings, cards and receipt paper: Understanding swath and CV with various methods. *Mark Ledebuhr (Principal Consultant, Application Insight)*

Description: Manned Aircraft have used cotton strings and fluorescent tracer for years to calculate their swath, made popular by WRK of Arkansas and NAAA Project SAFE. Other systems use water sensing cards or more recently, food dye on receipt paper rolls. We'll talk about the strengths and

weaknesses of each collection and analysis system, and end with a more detailed discussion of how to Estimate swath and CV with a Swath Gobbler and continuous paper rolls.

12pm-12:50pm: Lunch (grand ballroom)

Lunch Presentation: NAAA Update. *Andrew Moore (CEO, National Agricultural Aviation Association)*

Description: The National Agricultural Aviation Association presentation will discuss the scope, size, and makeup of the aerial application industry today. It will also discuss the key policy issues in which the association is advocating, particularly labeling pesticides for aerial use via the EPA pesticide registration process, in a manner that is not unnecessarily burdensome. This will include developing industry surveys, atmospheric model interpretation, and efforts to modernize those models to take into account the growing number of drift reduction technologies and different ways to treat aurally (crewed and uncrewed aircraft) today. The presentation will also discuss policy issues the association is advocating related to ensure the safety of low-altitude agricultural aircraft.

1pm-3pm: Panel Discussion-Regulatory Compliance (grand ballroom)

Moderators: *Sarah Hovinga (Regulatory Policy Analyst, Bayer CropScience), Joel Jones (Commercial UAV Instructor, Orange Coast College CA)*

Description: This afternoon panel session will be a continuation of the morning's regulatory theme around training and certification in aviation and pesticide applications with drones. Panelists (regulatory session speakers in the morning) will briefly introduce themselves and their activities in the drone space, the panel will discuss prepared questions related to the theme, and there will be time for audience questions at the end.

3pm-3:30pm: Networking and exhibitor visit

February 28th

7am-8am: Breakfast (grand ballroom)

Breakfast Presentation: Beyond Line of Sight Operations and Part 137 Operations. *Jonathan Rupprecht, Esq. (Commercial Pilot (ASEL/AMEL) & Flight Instructor (CFI/CFII), Rupprecht Law, P.A)*

Description: In this talk, the attorney will talk about beyond line-of-sight operations used in conjunction with Part 137 types of operations. We will discuss operations under Part 107 versus Part 91, Part 107 regulations to consider, Part 89 Remote Identification, Export Controls, Agricultural Considerations, Mapping Considerations, and Questions to Ask When Shopping.

Drone Operator Session (grand ballroom)

8:00am-8:25am: Shared Airspace in Agriculture. *Greg Wing (Owner, Heritage Ag Crop Dusting Service)*

Description: Shared Airspace in Agriculture is focusing on how manned and unmanned agriculture aircraft can work in unison for better communication, safety, and plant protection coverage. This presentation will focus on how the two industries can work directly with one another and in depth look Heritage Ag makes it happen in Central Michigan.

8:25am-8:50am: Specialty Crops and CA Operations. *Briana Layfield (President, Ag-Bee LLC)*

Description: Specialty crop application via UAS requires a different approach than commodity crops. Crop characteristics, varying terrains, label requirements, and efficacy all play a significant role in successful UAS specialty crop applications. California is absolutely one of the most regulated states in the US for agriculture and pesticide use, however, being able to effectively apply via UAS in an increasingly regulated environment is vital to furthering the industry.

8:50am-9:15am: Invasive Species and NY Operations. *Rick Jordan (Owner, CNY Drone Services)*

Description: Exploring alternative application methods to combat invasive species via drone. Northeast vs. Midwest – Let's take a closer look at operational differences based on geography.

9:15am-9:40am: Scaling Up - Managing Multi-State Operations. *Tyler Mclaney (Owner, Southern Crop Services)*

Description: The story of Southern Crop Services, how we ended up where we are and where we are going. We will be discussing the challenges and processes associated with multi-state large acre application operations.

9:40am-10:05am: Beyond Agriculture - Alternative Use Cases. *Mark Black and Matt Brooks (Owners, KT Precision Ag)*

Description: The risk and rewards of flying outside the lines. Learning how to become proficient in making applications away from the farm.

10:05am-10:30am: Coffee Break and Exhibitor Visit

Breakout room 1: Research Session

10:30am-10:50am: Spray Deposition and Efficacy of Pesticide Applications with Spray Drones in Rows Crops. *Dr. Simer Virk (Extension precision ag specialist, Assistant Professor. University of Georgia)*

Description: This presentation will include comparison of spray deposition within the crop canopies for pesticide applications with spray drones, ground sprayers and manned aerial

applicators. Results on the efficacy of different pesticides (fungicides and defoliants) applied with spray drones and traditional application methods will also be presented.

10:50am-11:10am: Cotton Defoliation Evaluation with Spray drone, Ground sprayer and Airplane. *Livia Pereira (PhD student, Auburn University)*

Description: Field results related to cotton defoliation efficacy from spray drone, ground sprayer and airplane, and the effects of spray volume (GPA) and drift reducing agent will be discussed in this talk.

11:10-11:30am: Cover Crop Spreading Pattern Comparison with T40 and P100 Pro. *Thiago Caputti (MS student, Auburn University)*

Description: In this presentation, spreading pattern, uniformity and effective swath width for spreading cereal rye and ryegrass will be reviewed. We will also discuss the influences of speed and flight height on spreading uniformity and swath width.

11:30-11:50am: Dive deep into the cause of drone streaking. *Dr. Steve Li (Extension Specialist, Associate Professor. Alabama Cooperative Extension System and Auburn University)*

Description: Streaking is a very common problem among aerial applications for both airplane and spray drones. Many drone operators do not feel comfortable spraying contact herbicide, defoliants, and desiccants because of this problem. Some people claim narrowing spray swath is the magical cure of this problem which is only partially true. I will use the results of multiple field trials as examples to illustrate main causes of drone streaking and how to management this risk in field operation.

Breakout room 2: Equipment and Software Session

10:30am-10:50am: Pix4Dfields & Spray Drones - Mapping for success in the field. *Nathan Stein (Partner, Pegasus Robotics)*

Description: Learn how to use Pix4Dfields boundaries, obstacles and no-spray zones in order to be safe and successful in the field. Use new targeted operations to conduct precision strikes in-field and make variable rate applications of fertilizer and seed to step up your game. Upload your data now to John Deere Operations Center or Pix4Dcloud to share results to your operation or customers.

10:50am-11:10am: XAG Introduction, P100 Pro Updates and Q&A. *Arthur Chen (President & CEO, Pegasus Robotics)*

Description: The internet is buzzing with videos and questions about the fastest (32MPH) and largest (50L) spray drone on the market. Take part in this presentation to learn all the well thought out features of XAG's 9th generation spray drone and its capabilities. Q&A to follow after presentation.

11:10-11:30am: Leveraging Software to Increase Drone Operation Efficiency - Fly More and Deliver Better Service. *Mariah Scott (CEO, Rantizo)*

Description: As equipment improves, allowing operators to cover more acres per hour, end users increasingly need operational efficiency to achieve the drone's potential. Often with condensed spray windows and tight seasons, every minute matters. Software, support, and training can help operators do more flying and applying, while maintaining the safety and compliance needed for the industry to responsibly expand. Rantizo, with operators in its network that flew nearly 200k acres in 2023, has developed software to increase operation efficiency, and provide agronomists and end users with exclusive As Applied Map technology for DJI drones in North America.

11:30-11:50am: CEO of Hyllo - New Products and Features. *Arthur Erickson (Founder and CEO, Hyllo)*

Description: Arthur Erickson (CEO and Co-Founder at Hyllo) will describe our current lineup of crop protection UAS and key technological features. I will also dive into what is on the horizon in terms of upcoming developments in the industry.

12pm-12:50pm: Lunch (grand ballroom)

Lunch Presentation: Exploring DJI's Complete Agricultural Solutions and Recent Developments in Drone Technology. *Mingkai Zhang (Agricultural Solution Engineer, DJI Agriculture)*

Description: This segment delves into the complete solutions and procedures specific to the use of drone technology in row crop farming within the US market. We will address many significant issues, including signal connectivity, effective swath width, and terrain considerations such as rolling hills. We will also present the most recent studies on chemical usage for drone-based spraying.

1pm-3pm: Panel Discussion- "How to get your drone spraying business started" (grand ballroom)

Moderators: *Vaughn Tolbert (Owner, VT Insurance Agency), Taylor Marret (Owner, Sugar Creek Ag)*

Description: This panel session will include a few panelists with different backgrounds to discuss insurance, liability management, and hoops to jump through in their states to establish and manage custom spray operations.

3pm-3:30pm: Networking and exhibitor visit

February 29th

7am: Pick up boxed breakfast and board buses

7:15-8am. Travel to field site

Field Demonstration (Outdoor)

Stop 1: XAG P100 Pro operation / in-field demo with spray swathing. *Nathan Stein (Partner, Pegasus Robotics)*

Description: See for yourself the legendary XAG P100 Pro in operation. Watch it spray autonomously at full speed and land with precision every time. Check out the spray pattern using the Swath Gobbler from Application Insight (weather permitting). Learn from our experts with Q&A.

Stop 2: Drone Trailer Solutions: Improving safety, increasing output and reducing operational cost with automation. *Nathan Stein (Partner, Pegasus Robotics)*

Description: Safety, quality of application and efficiency of operation are keys to success. Come see Pegasus Robotics' fully equipped Drone Trailer with diesel generator, flight processing, automated chemical mixing/batching and fast load out. See how safe and fast application of chemicals can be with the proper equipment in the field.

Stop 3: PrecisionVision 40X UAS Payload Versatility for Aerial Application, LiDAR, and Multispectral Imagery. *William Reynolds (President, Leading Edge Aerial Technologies Inc.)*

Description: Designed, engineered, and manufactured in Daytona Beach, Florida, USA by Leading Edge Aerial Technologies, Inc. (LEAT), the PrecisionVision 40X (PV40X) is the most versatile and capable UAS aerial application platform available. With four interchangeable payload system options, the PV40X completes any task required for both imagery/LiDAR needs and aerial applications including liquid, granular, and ultra-low volume treatments.

Stop 4: Live Demo of Hylío Crop Protection UAS. *Arthur Erickson (CEO, Hylío)*

Description: Arthur Erickson, CEO at Hylío, will pilot Hylío crop protection UAS in order to showcase unique features and benefits.

Stop 5: Increase Efficiency with Pickup Box Tenders. *Joshua DiPippo (Owner, Spotters Aerial Ag)*

Description: The Roadrunner is turnkey pickup box skid unit that allows applicators an effective and flexible solution to spray both large and difficult to reach areas more efficiently. Spotters Aerial Ag will demonstrate how to cut down set up, tear down and in field operations with the Roadrunner mobile tendering unit.

Stop 6: Multispectral Fruit Tree Mapping and 3D Route Spraying. *Jeff Clack and Rhyán Syester, (Territory Manager and Technical Director and training instructor, Bestway Ag)*

Description: Jeff and Rhyan from Bestway Ag will demo DJI Mavic 3M and Agras T-40 working together to provide precision fruit tree mapping and 3D spraying route execution among obstacles. Water sensitive papers in fruit trees will be analyzed post flight.

11:30am-12:30pm: Travel back to conference hotel

12:30pm-1:30pm: Lunch

1:30pm-3:30pm: Panel Discussion-Spray Drone Field Operation (grand ballroom)

Moderators: *Jeremy Williams (Owner, American Drone), Bryan Hammis (CEO and Founder, Flying Aces)*

Description: In this session, experienced drone operators and custom application business owners will discuss operational challenges, Do and Don'ts, drone application business ROI, key steps for success and the future of drone applications. This is an excellent opportunity for new spray drone operators to learn from the best and ask questions regarding their operations.

3:30pm-4pm: Networking and exhibitor visit

4:30pm-6pm: Farewell Reception (grand ballroom and foyer)

6pm: Conference Adjourn