Unmanned aerial vehicle (UAV) and Robotics and Pesticide Regulations
What’s Happening in the EPA

➢ Working with several stakeholders/working groups – both US and international on UAVs:
  - SFIREG/APPCO
  - PPDC – Emerging Technology Workgroup
  - RPAAS WG (led by Canada)
  - Organization of Economic Cooperation and Development (OECD) WG on drones
    - Completing literature review on drone applications – efficacy, drift, exposure, modeling
  - Center of Excellence for Regulatory Science in Agriculture (CERSA) Workshop on UAS and Manned Aerial Applications (Dec 2020)
    - Focused on:
      - Potential benefits and current and future anticipated uses of UAS
      - Spray drift models for existing application methods and UAS
EPA Risk Assessment – UAV Considerations

➢ Currently no approved model to evaluate drift from emerging technology like UAVs
➢ Priority for EPA is to understand the exposure considerations that this emerging technology presents and how it compares to existing application technology
➢ EPA continues to work towards a standard policy and risk assessment method to evaluate potential risk from emerging technology like UAV application
PPDC Emerging Agricultural Technologies Workgroup: Roster, May 2021

• Manojit “Mano” Basu, CropLife America (Co-chair)
• Ed Messina, EPA/OPP (Co-chair)
• Ruben Arroyo, Riverside County Department of Agriculture and Measurements Standards
• Dan Cederberg, Teejet
• Gilbert Del Rosario, Corteva Agriscience
• Adam Finch, BASF
• Josh Friell, The Toro Company
• Brad Fritz, USDA, ARS
• Rebecca “Becca” Haynie, Syngenta
• Ramon Leon, North Carolina State University
• Lauren Lurkins, Illinois Farm Bureau
• Daniel Markowski, Vector Disease Control International
• Dan Martin, USDA, ARS
• Jacob Moore, ADAMA
• Robby Personette, Wisconsin Department of Agriculture
• Damon Reabe, National Agricultural Aviation Association
• Karen Reardon, RISE (Responsible Industry for a Sound Environment)
• Margaret Reeves, Pesticide Action Network
• Brian Satorius, Independent Grower
• Scott Shearer, Ohio State University
• Bryan Sanders, HSE-UAV
• Christina Stucker-Gassi, Northwest Center for Alternatives to Pesticides
• Nick Tindall, Association of Equipment Manufacturers
• Anne Turnbough, AMVAC Chemical
• Greg Watson, Bayer
PPDC – Emerging Technology WG
Charge Questions

• How should EPA obtain a greater understanding of how the use of emerging agricultural technologies leads to reduced or increased risks that differ from those resulting from current methods?

• What changes to EPA’s approach to pesticide labels, if any, are needed to accommodate emerging technologies?
Deliverables Discussed at ET WG

• Deliverable 1 – List of Emerging Technologies
  • List of emerging technologies that can be used for or, in support of, or in place of pesticide application
  • Any regulatory oversight or risk assessment changes by EPA needed to facilitate their use

• Deliverable 2: Deep dive on Autonomous Application Platforms operated remotely and/or manually
  • How these technologies lead to reduced or increased risks that differ from those resulting from current methods
  • What changes to EPA’s approach to pesticide labels, if any, are needed to accommodate these technologies
Deliverable 1: List of Technologies

Hardware
- UAVs/Drones
- Spray/Nozzles
- Ground Robots
- Equipment Improvements to Existing Application Equipment

Data and Analytics
- Maps
- Statistical Analysis
- Prescriptive Agriculture
- Artificial Intelligence
Deliverable 1: Technologies List

**Equipment Improvements**
- Autonomous Spray Systems Aboard Current Manned Aircraft and Ground Sprayers
- Spot Farming
- Boundary Mapping
- Smart Guidance
- Boom Height Control
- Rate Control
- Section Control
- Equipment Mounted Weather Stations

**Ground Based Robots**
- Land care robot
- Robot for mechanical weed control
- Tool-carrying robot
- Bug vacuum
- Autonomous Tractor
- Autonomous Ground Sprayer

**Spray/Nozzle**
- Nozzles the dramatically reduce or eliminate small droplets prone to drift
- Direct Injection
- Stacked (Tiered) Nozzles
- Targeted Spray Technology
- Pulse with Modulation
Future Work

Deliverable 1:
- Any regulatory oversight or risk assessment changes by EPA needed to facilitate their use including:
  - Regulatory Framework from a risk standpoint and suggest measurable benchmarks that must be proven to realize risk assessment benefits, i.e. if a tech reduces drift by 80% this is fully accounted for in the risk assessment process and communicated in label language

Deliverable 2:
- How these technologies lead to reduced or increased risks that differ from those resulting from current methods
  - Continue engaging with industry, academics, CERSA, EPA and other stakeholders to develop understanding for a developing an outline of a risk framework
- What changes to EPA’s approach to pesticide labels, if any, are needed to accommodate these technologies
  - Use the learnings to recommend pesticide label changes that may or may not be required to accommodate these technologies