

Industry Response to Pesticide Regulators' "State of the Knowledge" Review of Unmanned Aerial Vehicle (UAV) Use for Pesticide Application

Overview of the Unmanned Aerial Pesticide Application System Task Force (UAPASTF)



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Global regulatory landscape of drone application technology

North America

USA: EPA defers to states provided aerial application is allowed on the federal label.

CAN: Some registered labels for drones, overall policy being developed.

Latin America

BRA, CRI, URY: Drone application is allowed once aerial application is already approved on the label.

GTL, COL, MEX: Some drone application permitted. Regulation under discussion.

ECU, PER: Drone application not allowed. Regulation under discussion.

Europe, Middle East, Africa

EU: Mostly aerial application banned except with specific exemptions.

DEU, CHE Drone application allowed for specific applications.

HUN: local regulation under construction.

Burkina Faso, Ghana, Kenya, Zambia, South Africa: strong interest in drone application

Asia Pacific

JPN, KOR: Most advanced countries. Application via drones allowed, regulations in place.

MYS, PHL, IND: Regulations in place.

CHN, THA, IDN, VNM: Commercial use permitted/permitted soon while guidance is developed in parallel

PAK,MMR: Regulations under development

OECD WPP Drone/UASS Subgroup

Founded in August 2019 by the Working Party on Pesticides (WPP) to provide guidance on regulation Organisation for Economic Co-operation and Development (OECD) of use of unmanned aerial vehicles for application of crop protection products

Principles for a regulatory framework for UAV application



OECD WPP Drone/UASS Subgroup

OECD Drone/UAV Subgroup of WPP

Overview of Participants



Example



A global effort

- // OECD member countries, led by the United Kingdom
- // European Commission
- // Business at OECD (BIAC)
- // Invited Experts

OECD Drone/UAV Subgroup of WPP

Key Steps



- // Decision to start with existing data / info (Oct 2019 – Jan 2020)



- // Information collection requests (Mar 2020 & Oct 2020)



- // Consultant to review existing data / info write data evaluations (DERs) / overview document (June – Oct 2020)



- // Subteam to work with consultant (July 2020 – Feb 2021)

published on the APVMA, OECD website at :
<https://apvma.gov.au/node/91741>
[https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/CBC/MONO\(2021\)39&docLanguage=En](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/CBC/MONO(2021)39&docLanguage=En)

WPP Approved Public Release of 'state of knowledge' Document (July 2021)



- // DERs / overview document completed (Mar 2021)



- // WPP Recommendation for next steps agreed - *shifting Subgroup to facilitate global development of UAV application regulations, implementing 'state of knowledge' document recommendations*
- // *Work Packages in-progress* (July 2021 - present)

Industry sponsored task force – Task Force (UAPASTF) established

OECD WPP Drone/UASS Subgroup

Work Package #1 – off-site exposure including exposure modeling (BIAC / CDN / US)

Work Package #2 – scanning / survey to stakeholders (UK)

Work Package #3 – ‘best practices’ guidance (BIAC)

Work Package #5 – connect to ISO (Research Institute / ISO representative)

Grouping of Recommendations from ‘State of Knowledge’ Report

- #7. Develop an empirical database and standard drift curve or model to estimate off target exposure.
- #9. Develop a useable publicly available model for predicting spray deposition and drift including parameters for static hovering, forward speed and spray equipment.
- #1. Establish database to classify UASS into groups to reduce burden of testing each different platform/configuration.
- #2. Survey manufacturers about future trend of UASS design/ use profiles to produce a benchmark platform as a common starting point for regulators (others may differ and need bespoke assessment but would cover most common uses).
- #8. A data gathering exercise for operational practices mixing, loading, cleaning and transport scenarios.
- #5. Develop and publish a user-friendly summary of best practice (including the essential nature of calibration), pitfalls and a trouble shooting guide (both for generating trials data and applying pesticides in practice), including preliminary recommendations for operational parameters (release height, application volumes, forward speed and spray quality).
- #6. Promote the advice in Annex D recommendations for researchers conducting UASS drift studies.
- #4. Develop set of standard methodologies that will support regulatory decision making.
- #3. Encourage manufacturers to develop improved spray systems including the pump systems, nozzle placement and closed transfer loading systems. * ISO standard project

// The Subgroup has become an advisory body to provide expert input on how to fill knowledge gaps

// Grouping of ‘state of knowledge’ recommendations needed to develop / implement

// Workstreams Established, work in-progress

Unmanned Aerial Pesticide Application System Task Force (UAPASTF)



- // UAPASTF global core mission is to supply regulatory data / information to inform the potential use of UAV-based pesticide application
- // Where appropriate, the UAPASTF will focus on generating data for submission to pesticide regulatory authorities to inform estimates for off-site movement, determine potential operator/handler exposure, and assess crop residue contribution to human dietary exposure in risk assessment and regulatory approval processes.
- // UAPASTF alignment with work of the OECD WPP Drone/UASS Subgroup critical to success
- // UAV-based pesticide application a part of progression toward precision / digital agriculture with the potential for increasing sustainability



Unmanned Aerial Pesticide Application System Task Force (UAPASTF)



Industry sponsored task force – (UAPASTF) established

// Based in the US - but global in its work / focus

// UAPASTF to interact with OECD Drone/UASS Subgroup of WPP, regional / national regulators, CropLife, & other stakeholders to develop & provide information / data

// UAPASTF Definitive Agreement Approved, Leadership Selected

UAPASTF Member Company	Administrative Committee Representative	Technical Committee Representative
BASF Corporation	David Haughey	Frank Donaldson (Chair)
Bayer CropScience LP	Greg Watson (Chair)	Jane Tang
Corteva Agriscience	Travis Bui (Vice Chair)	Rajeev Sinha
FMC Corporation	Hector Portillo	Roberto Barbosa
NuFarm Americas Inc.	Patti Turner	Tyler Gullen
Syngenta Crop Protection LLC	Becca Haynie (Treasurer)	Shanique Grant (Vice Chair)
Valent U.S.A. LLC	Robin Charlton	Banugopan Kesavaraju

Parties interested in the work of, or registrants interested in joining the UAPASTF should contact:

Dr. Greg Watson,
Chair, UAPASTF Administrative Committee

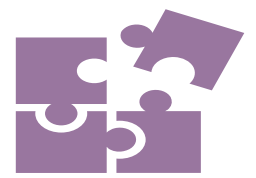
greg.watson@bayer.com

+1 314 343 8120

// Task force managers: Rhonda Bichsel & Eric Bruce

// Established collaborative agreements with UAV-application companies, seeking further agreements with other companies (e.g., additional UAV-application companies in other world areas, UAV & nozzle manufacturers)

Unmanned Aerial Pesticide Application System Task Force (UAPASTF)



Industry sponsored
task force –
(UAPASTF)
established

// Technical teams actively working

// **Off-site movement GLP study protocol & trials (Dave Haughey and Frank Donaldson, BASF)**

// **Including identifying ‘reference’ / ‘benchmark’ UAV & spray system**

// **Development of an off-site exposure estimate/model for UAV-based pesticide application related to environmental/ecological risk assessment**

// **‘Best practices’ guidance (Hector Portillo, FMC)**

// **Field crop residue project – Canada (Pam Livingston, Syngenta)**

CLA Interim Drift Key Takeaways



- ▶ Initial indications support the assumption that from a spray drift perspective, UASS curves are somewhere between aerial and ground-based methodologies, comparing closest to orchard airblast applications, based on the published literature.
 - ▶ Comparisons were done to basic drift curves for the EU, US, and Canada (See Figures 6 & 7 for examples)

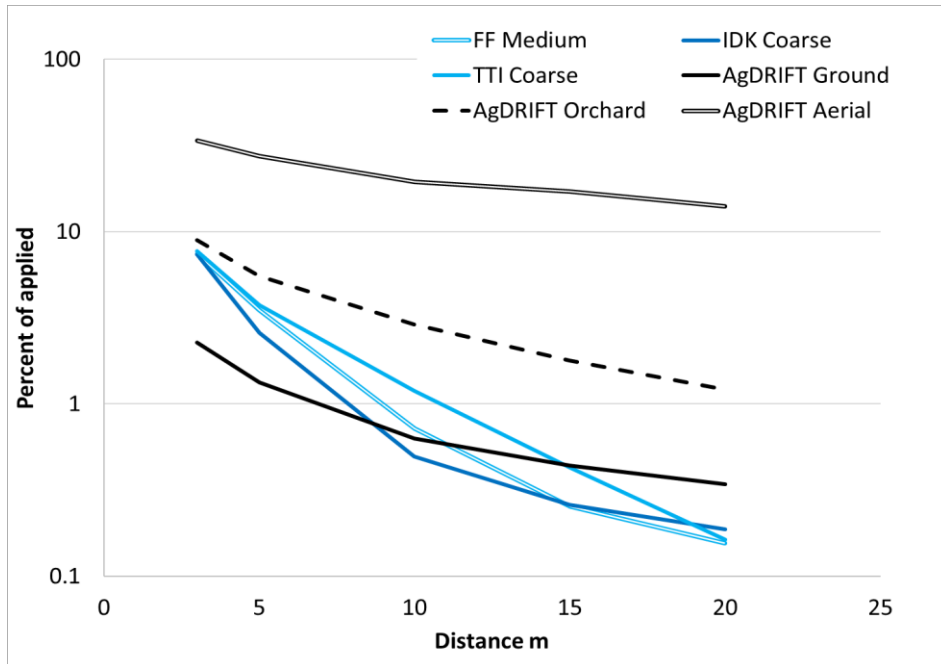


FIGURE 6 UASS DRIFT ASSESSMENT AND COMPARISON WITH THE EPA AGDRIFT 2.1.1 ORCHARD, GROUND, AND AERIAL CURVES. THE SIX-ROTOR UASS OPERATED AT A VELOCITY OF 3.6 M/S AND 4.6 M ALTITUDE, WITH A MEDIUM AND TWO COARSE NOZZLES

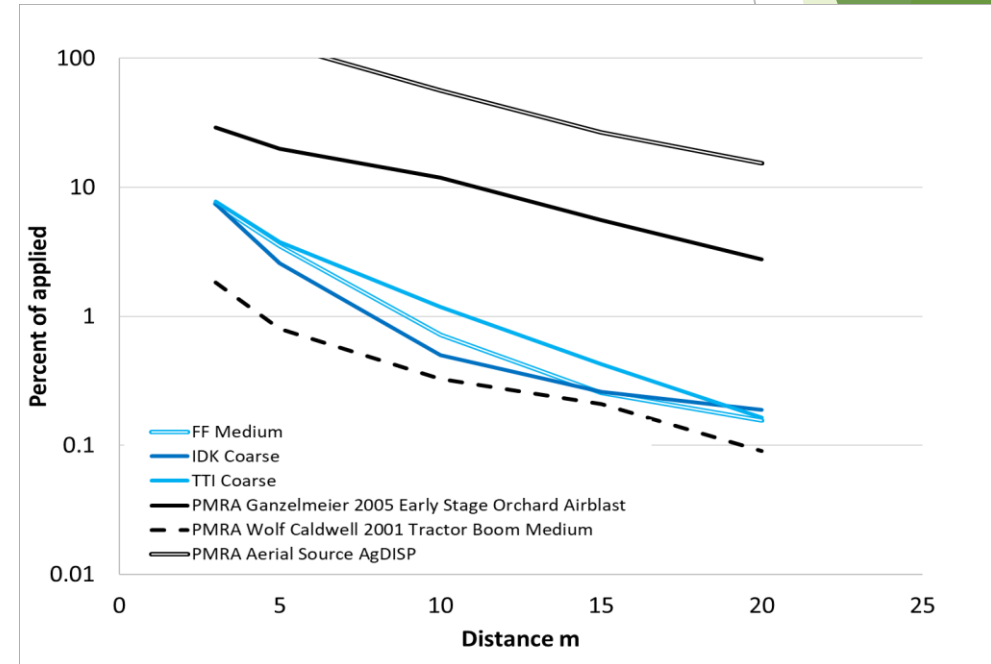


FIGURE 7 UASS DRIFT ASSESSMENT AND COMPARISON WITH THE PMRA AgDISP FOR AERIAL, AND EMPIRICAL DATA FOR TRACTOR BOOM SPRAYERS WITH A MEDIUM SPRAY DISTRIBUTION AND ORCHARD AIRBLAST EARLY. THE SIX-ROTOR UASS OPERATED AT A VELOCITY OF 3.6 M/S AND 4.6 M ALTITUDE, WITH A MEDIUM AND TWO COARSE NOZZLES

Unmanned Aerial Pesticide Application System Task Force (UAPASTF)



Industry sponsored task force – task force (UAPASTF) established

// Technical teams actively working

- // Advancing work of Crop Life America project with Dr. J. Bonds, development of interim exposure estimate/model based on empirical data
 - // Determine quality criteria for data to include in further exposure estimate/model work,
 - // Request additional raw data from published off-site movement studies,
 - // Incorporation of UAPASTF off-site movement study protocol data into these exposure estimates, &
 - // Mathematical approach to use raw data to develop off-site movement curves
- // Longer term: development of a mechanistic off-site exposure estimate/model for UAV-based pesticide application
 - // Desired: establishment of a tripartite (e.g., government / academia / industry) forum for development of exposure estimates for regulatory purposes

OECD Drone/UASS Subgroup of WPP Work Package #1 – off-site exposure including exposure modeling (BIAC / CDN / US)

Unmanned Aerial Pesticide Application System Task Force (UAPASTF)



// Technical teams actively working

// Off-site movement GLP study protocol, 8-10 GLP field studies planned in 2023

// Including identifying 'reference' / 'benchmark' UAV & spray system

// Potential trial sites in North America, Latin America, Europe, Africa, & Australia being considered

// Non-GLP 'dry runs' 1st Q 2023

// Focus in 2023 will be in North America, Latin America, Europe. Other regions included in 2024.

// Input from internationally recognized off-site movement experts sought & received

// Requested review / input from OECD WPP Drone / UASS Subgroup on study protocol

OECD Drone/UASS
Subgroup of WPP
Work Package #1 – off-site exposure including exposure modeling
(BIAC / CDN / US)

Unmanned Aerial Pesticide Application System Task Force (UAPASTF)



// **Technical teams actively working**

// **'Best Practices' guidance**

// Preparation of draft completed by UAPASTF 4th Q 2022

// Shared with UAPASTF collaborators 4th Q 2022

// Targeting 1st Q 2023 for external stakeholder input on draft

// **OECD Cooperative Research Program funded workshop in 2023 for additional expert / stakeholder input on this guidance**

// **In-person, May 23rd & 24th 2023, York, UK**

// **Expressions of interest requested by Feb 28th,
<https://www.hsl.gov.uk/health-and-safety-training-courses/crd-conference-and-workshop-applying-pesticides-using-drones>**

// **Field Crop residue project – Canada**

// **Supporting efforts for a funded Agriculture and AgriFood Canada project to address PMRA questions**

**OECD Drone/UASS
Subgroup of WPP
Work Package #3 –
'best practices'
guidance (BIAC)**

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Thank you!
Please reach out
with any questions:

Sarah.Hovinga@bayer.com

**Acknowledgements to the members below
and others involved in the UAPASTF work**



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