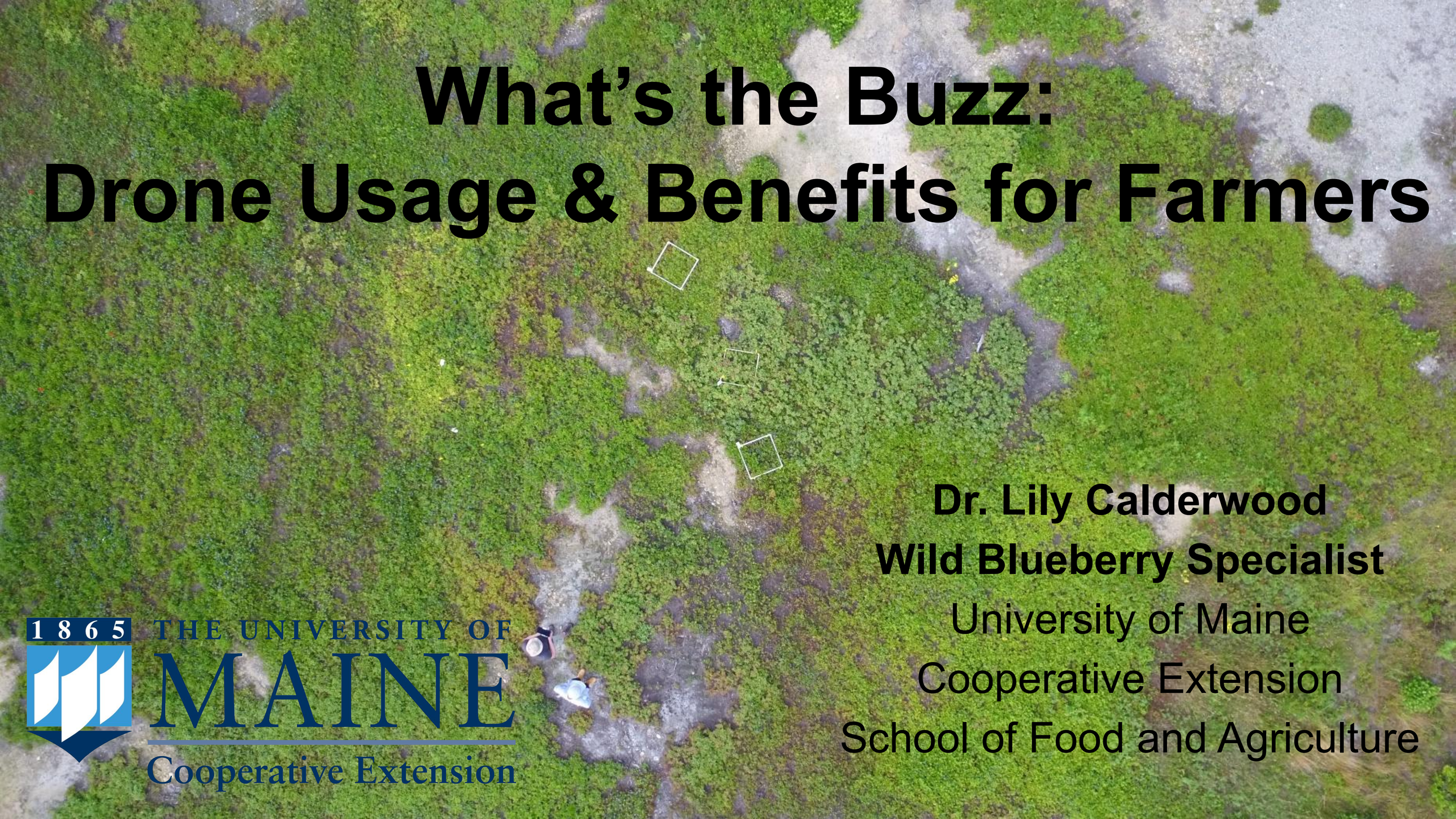
What's the Buzz:
Drone Usage & Benefits for Farmers



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Types of Cameras and Drones

- RGB camera: red, green blue color differentiated
- Multi-spectral camera: within colors differentiated
- Thermal camera: temperature differentiated
- Sprayer drone: carries a map and sprayer
- Spreader attachment: carries a map and granular material or seed

Multi-spectral Drone PC: DJI

AGRIS T40 Drone

PC: AI, Tom Massey

Drone Use in Maine to Date

- 2 Companies: Active Intelligence and Seed Solutions
- Spraying, Seeding, and Fertilizing

PC: News Center Maine

I work in the Wild Blueberry Agricultural System

Spray Drone Operators

- Must hold BPC Commercial License
- Must pass Aerial and Specific Crop Exams
- Must be Licensed to fly a drone by the FAA
- Can only drone spray products with Aerial Application on label

Drone Spraying is Considered Aerial Spraying

PC: Maine Helicopters

PC: Beyond Pesticides

Aerial Language on Pesticide Labels

- Aerial references throughout labels
- DO NOT section or _____ is prohibited
- Typically lower minimum tank volume requirements
- Apply no lower than 10ft
- Larger buffers
- Cannot apply when wind is >10 MPH

Herbicide Label Example: Arrow (clethodim)

MANDATORY SPRAY DRIFT

Aerial Applications:

- **DO NOT** release spray at a height greater than 10 feet above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- Applicators are required to use a coarse or coarser droplet size (ASABE S572.1)
- The boom length must not exceed 65% of the wingspan for airplanes or 73% of the rotor blade diameter for helicopters.
- Applicators must use ½ swath displacement upwind at the downwind edge of the field.
- Nozzles must be oriented so the spray is directed toward the back of the aircraft.
- **DO NOT** apply when wind speeds exceed 10 miles per hour at the application site.
- **DO NOT** apply during temperature inversions.

SPRAY DRIFT

Ground Boom Applications:

- Apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above ground or crop canopy. For all other ground applications, the nozzle must be no more than 3 feet from the target vegetation.
- Applicators are required to use a medium or coarser droplet size (ASABE S572.1)
- **DO NOT** apply when wind speeds exceed 10 miles per hour at the application site.
- **DO NOT** apply during temperature inversions.

Product Limitations

Product	Aerial Prohibited	Aerial Allowed	Notes
Arrow			Target: Grasses
Intensity One			
Selectmax			
Poast			
Sandea			
Express			Target: Broadleaves
Kerb			
Velpar			Target: Grasses & Broadleaves; Beware of resistance
Sinbar			
Diuron			
Matrix			
Rely			
Zeus			
Zeus Prime			
Asulox			
Callisto			
Explorer			

Agras T40 Specs

Spray drone tank is 10.5 gallons
Can empty in 5 minutes
Battery can drains quickly (switch out efficiently)
Spray width up to 30ft
3g/min spray output

Took 34 minutes to spray 6 acres at a rate of 5g/acre (5.6 min/acre)

Check it out: News Center Maine Video Article

STEP 1: Map Field $350

- RGB or Multispectral Camera on smaller drone – data can be used in tractor or drone
- Image Classification work to spot spray

STEP 2: Apply Material $25/acre

Farmer Supplies: pesticide, seed, or fertilizer

Questions?

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Northeastern IPM Center

SCHOOL OF FOOD AND AGRICULTURE

DALHOUSIE UNIVERSITY

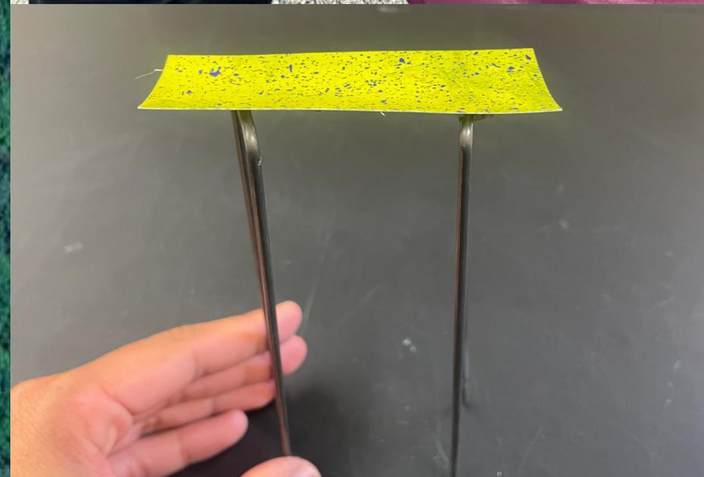
Drift Experiment – 10ft spray height

Exit | Task Time: 2024/07/22-2024/07/22 | 19 Total Record(s)

Task Area	No. of Aircraft	No. of Pilots
1.36 ac	1 Aircraft	1 person

Spraying Task

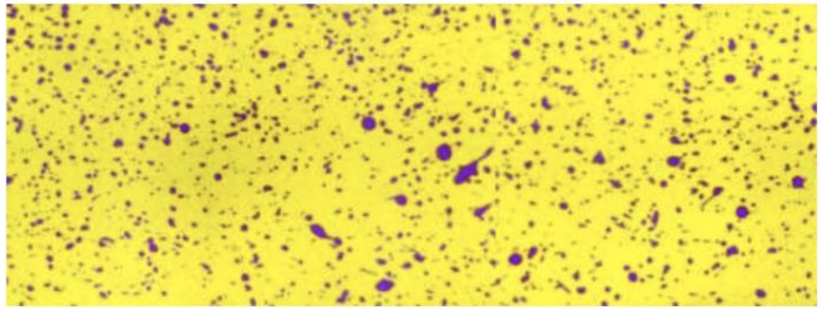
Spraying Area	Flight Duration	Total Amount Sprayed
1.36 ac	33.5 min	39.28 L



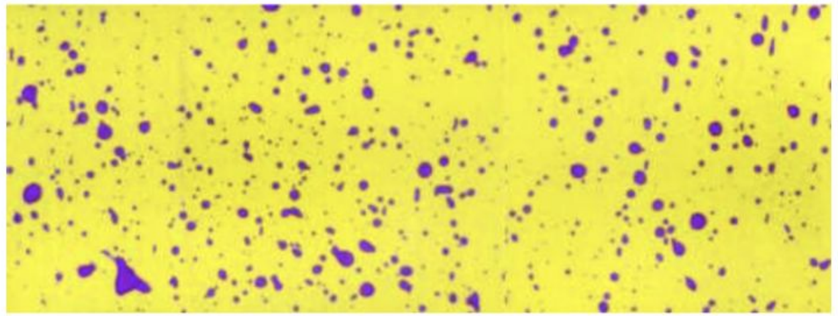
of large droplets increases with swath width and droplet size

Swath Width Drone Settings

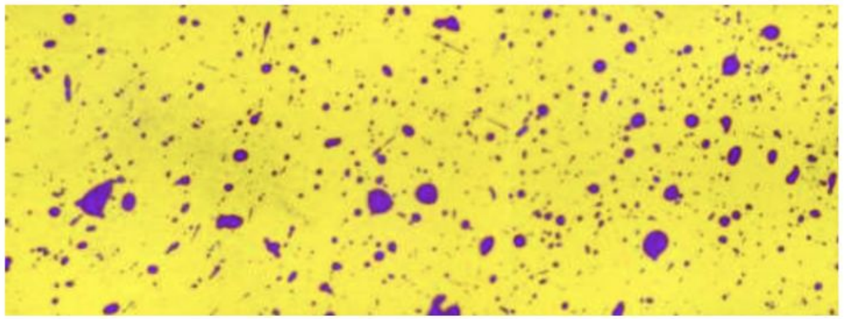
10 ft:



20 ft:

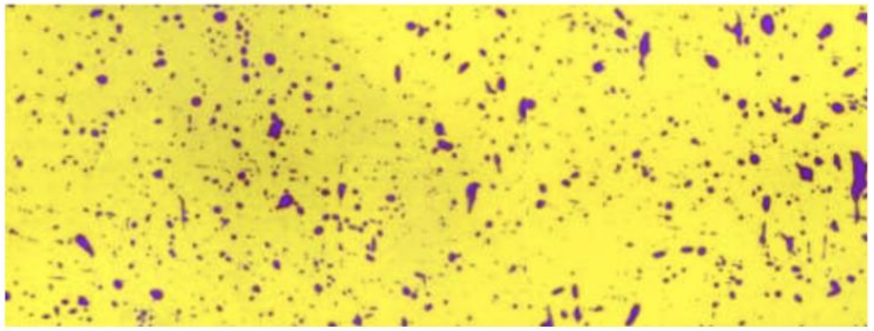


24 ft:

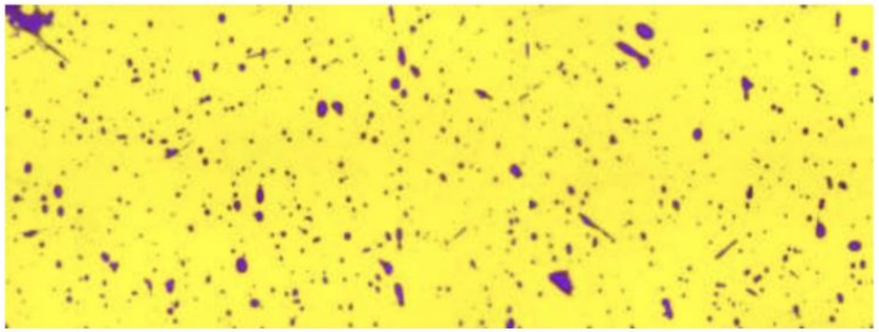


Droplet Size Drone Settings

220 µm:



280 µm:



340 µm: