

Application Technology – Making the Most of \$\$\$ Spent on Pesticides

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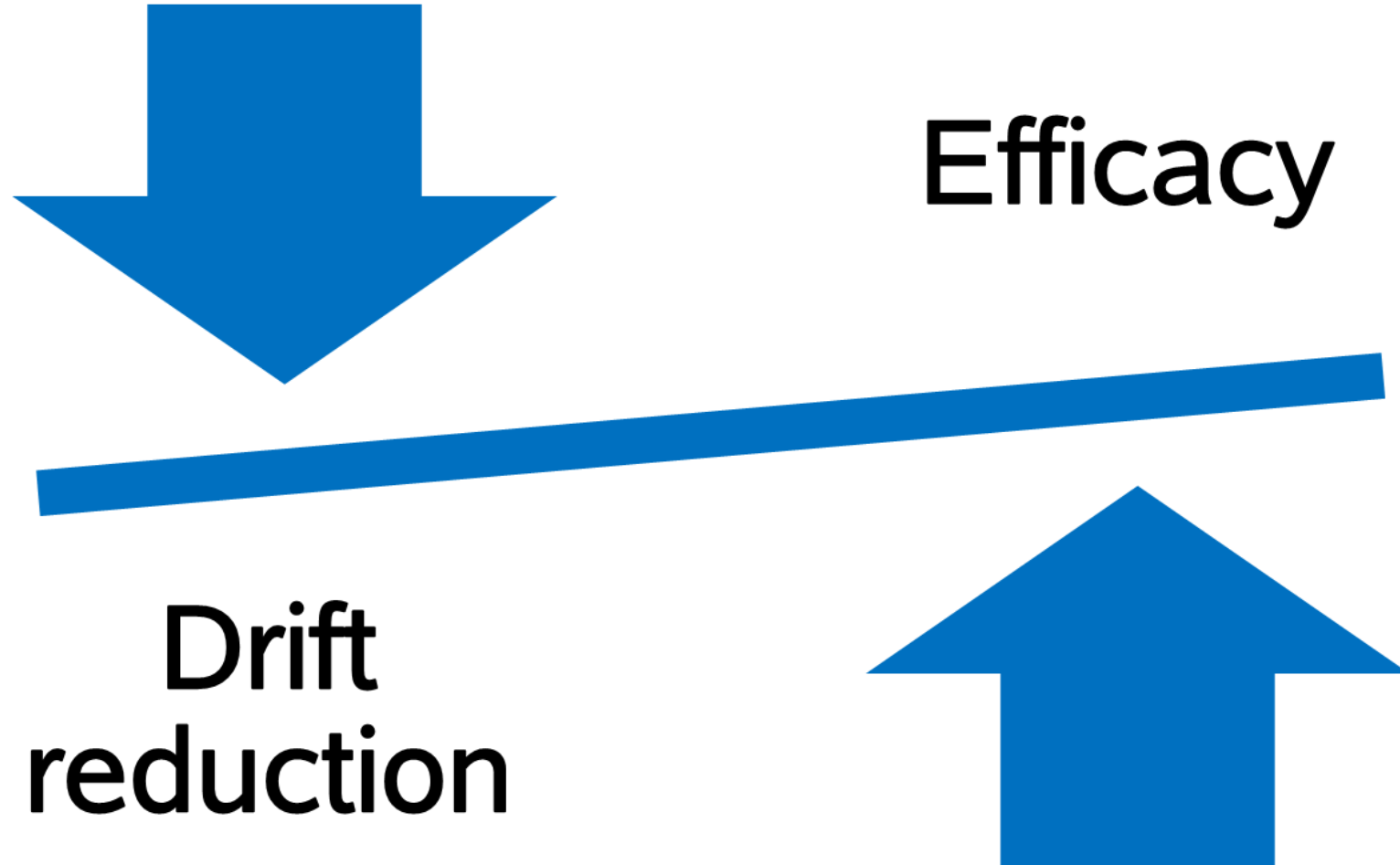
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Don't Forget About the Application Process!



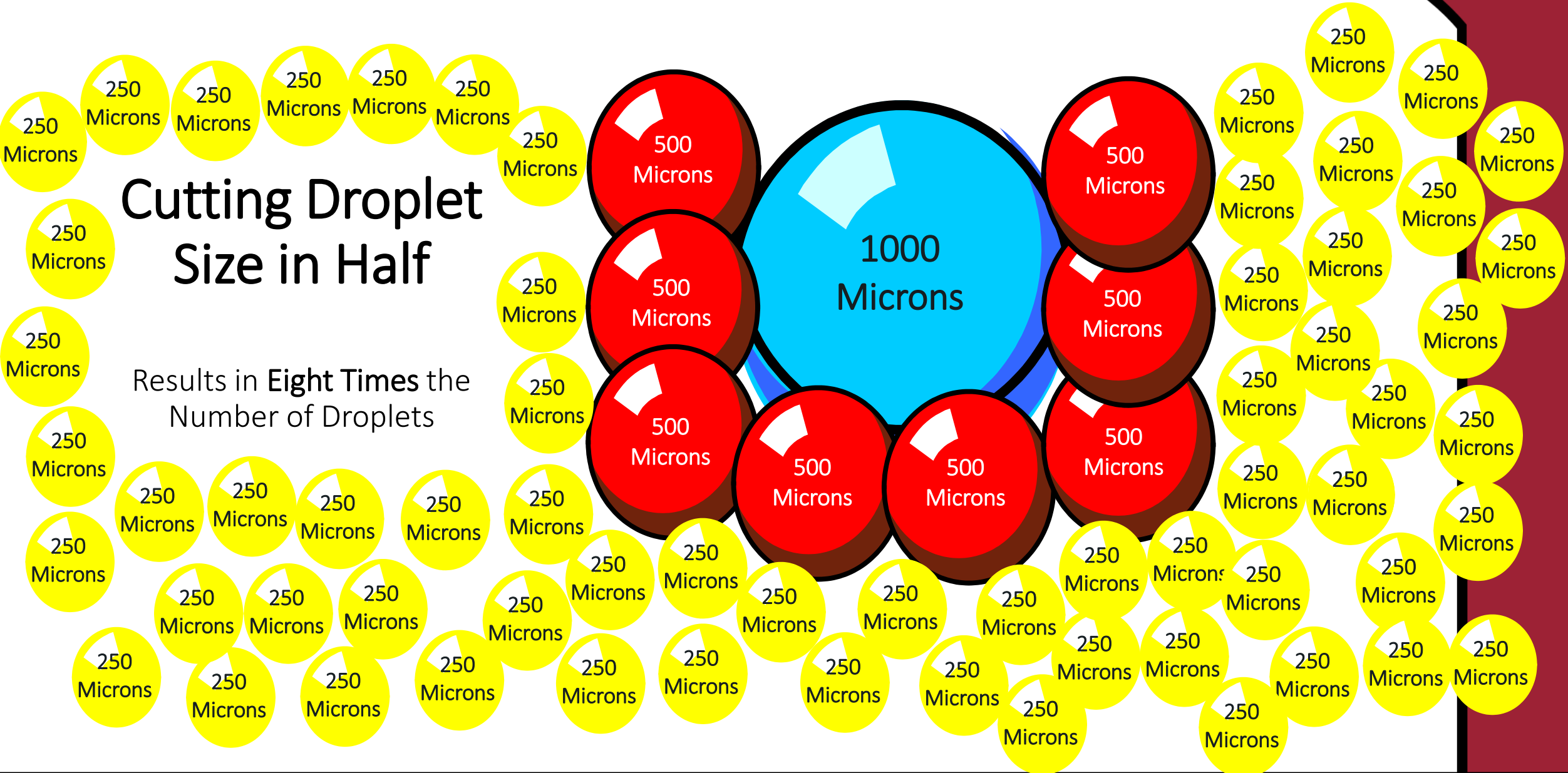
Importance



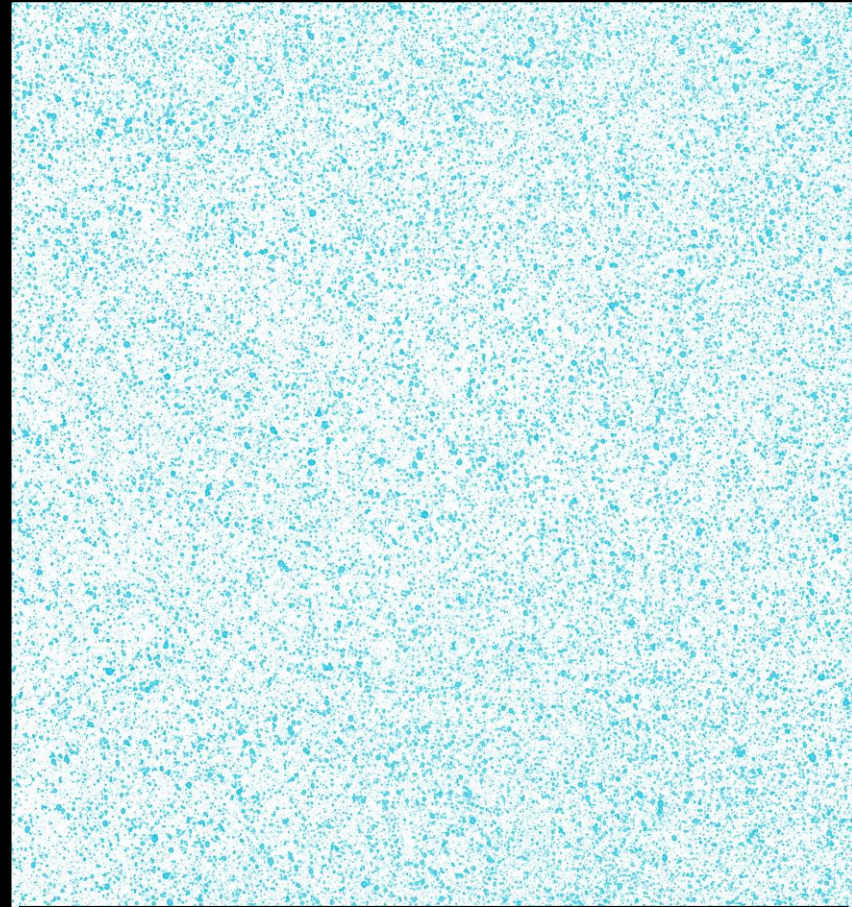
Droplet Size vs. Coverage

Cutting Droplet Size in Half

Results in **Eight Times** the Number of Droplets

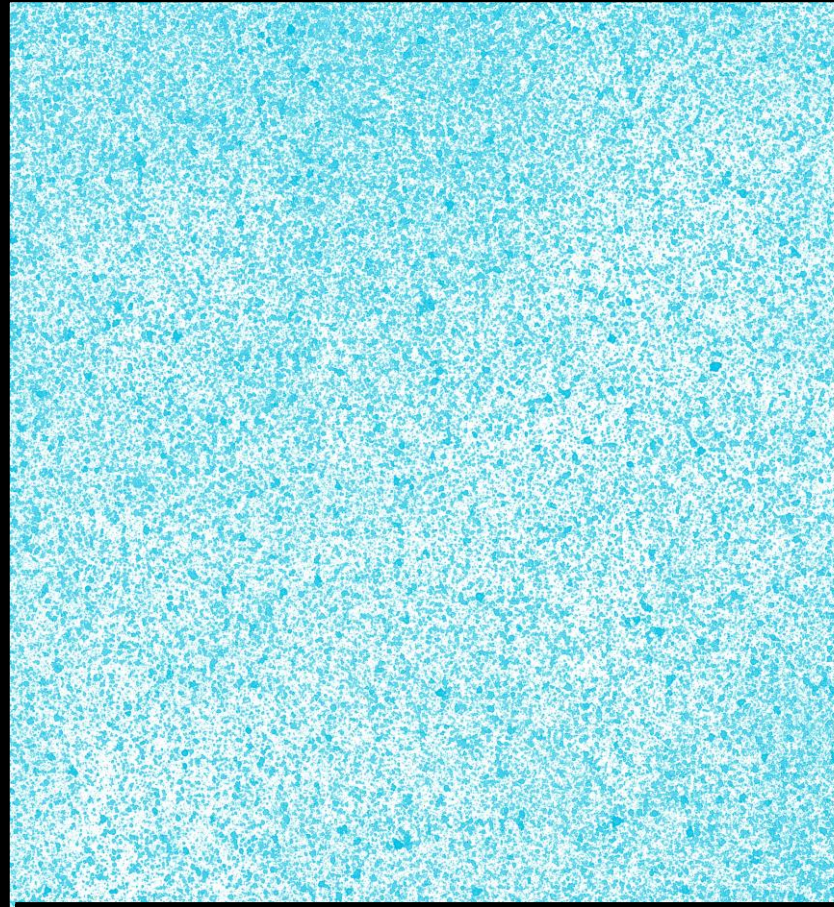


Spray Coverage (XR nozzle)



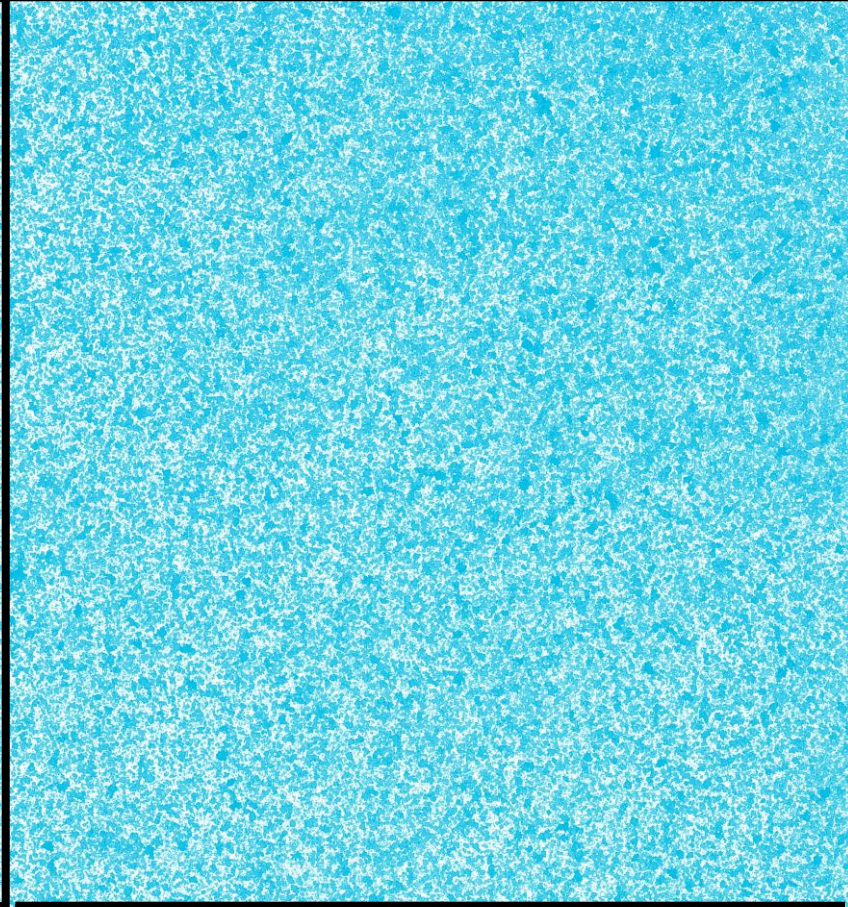
XR – 5 GPA

Droplet size	Spray Classification	Coverage
280 μm	Medium	19.9 %



XR – 10 GPA

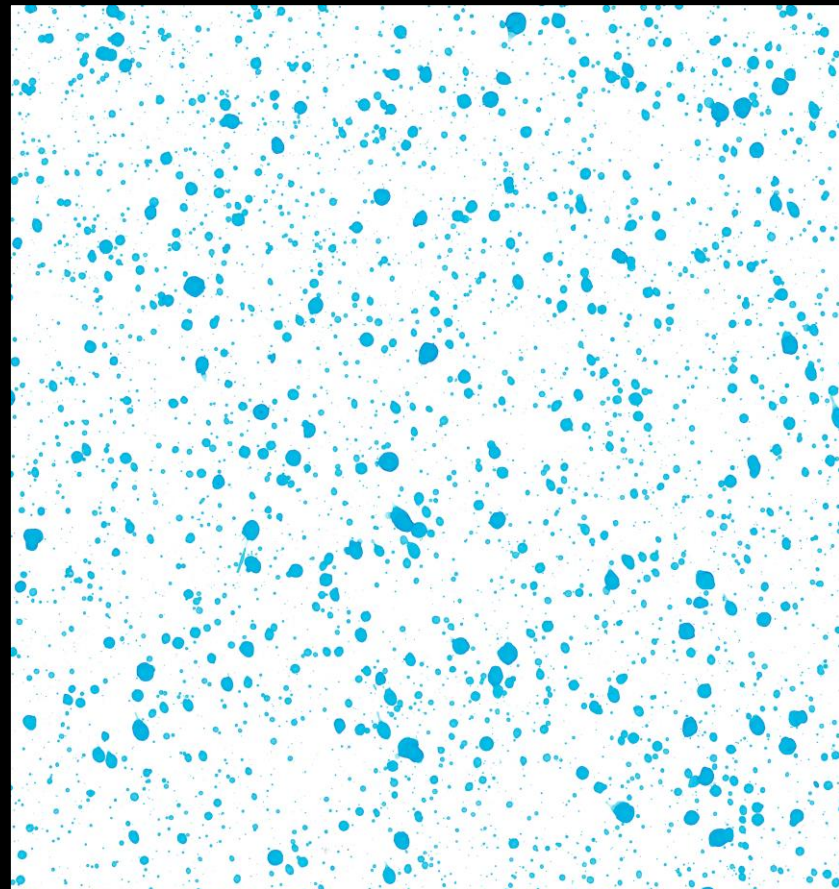
Droplet size	Spray Classification	Coverage
280 μm	Medium	42.7 %



XR – 15 GPA

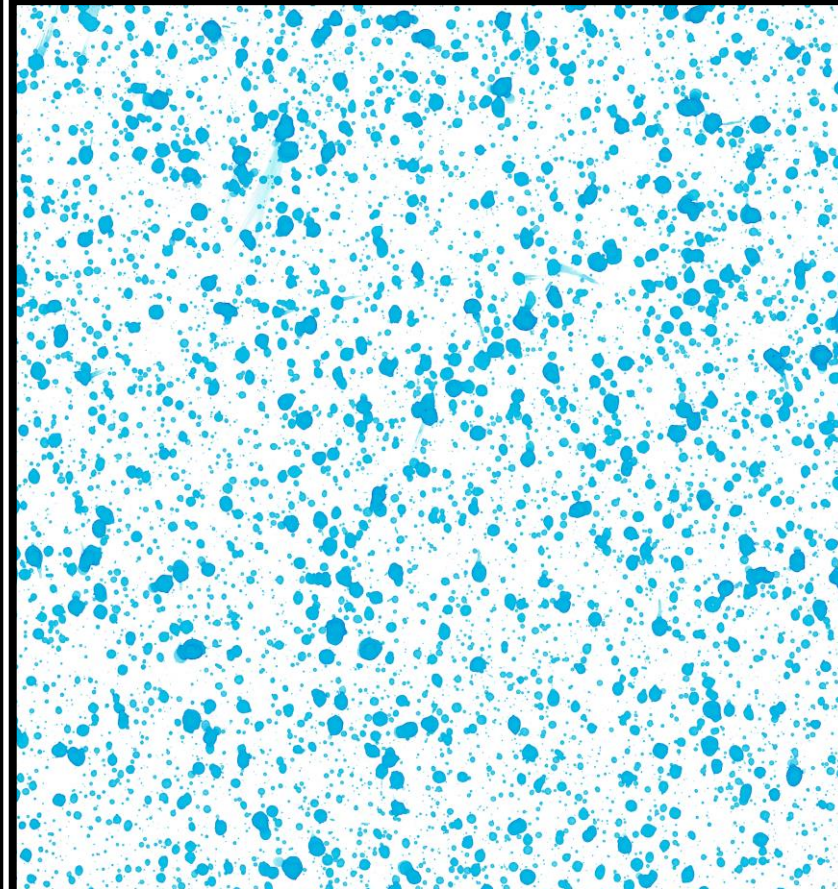
Droplet size	Spray Classification	Coverage
280 μm	Medium	64.5 %

Spray Coverage (TTI nozzle)



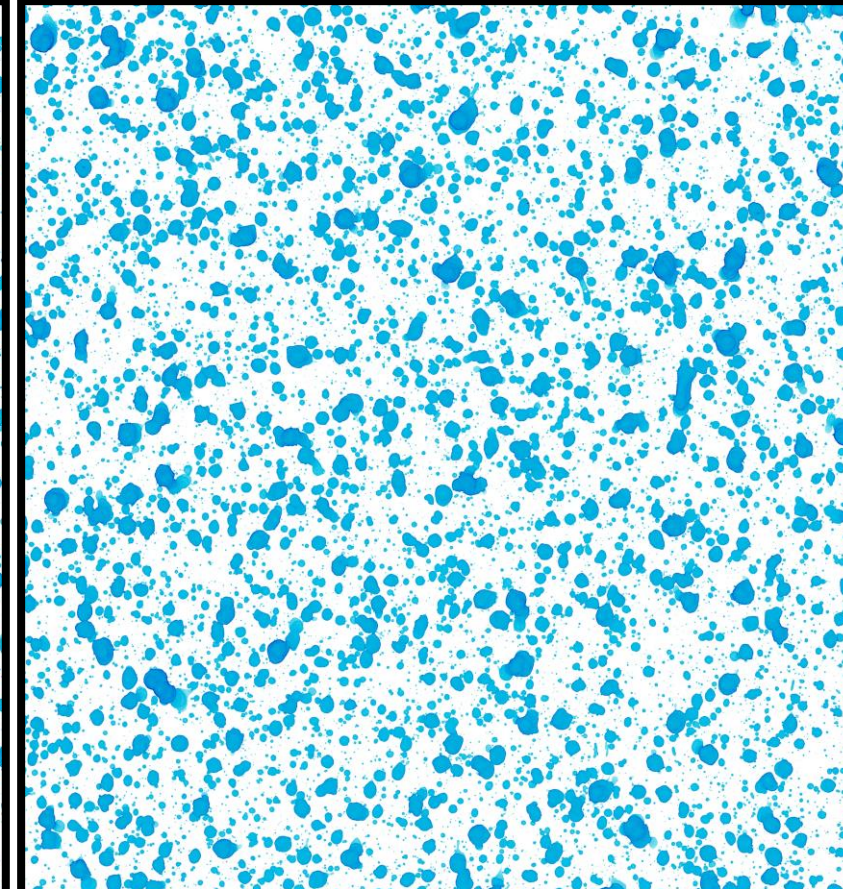
TTI – 5 GPA

Droplet size	Spray Classification	Coverage
800 µm	Ultra Coarse	9.7 %



TTI – 10 GPA

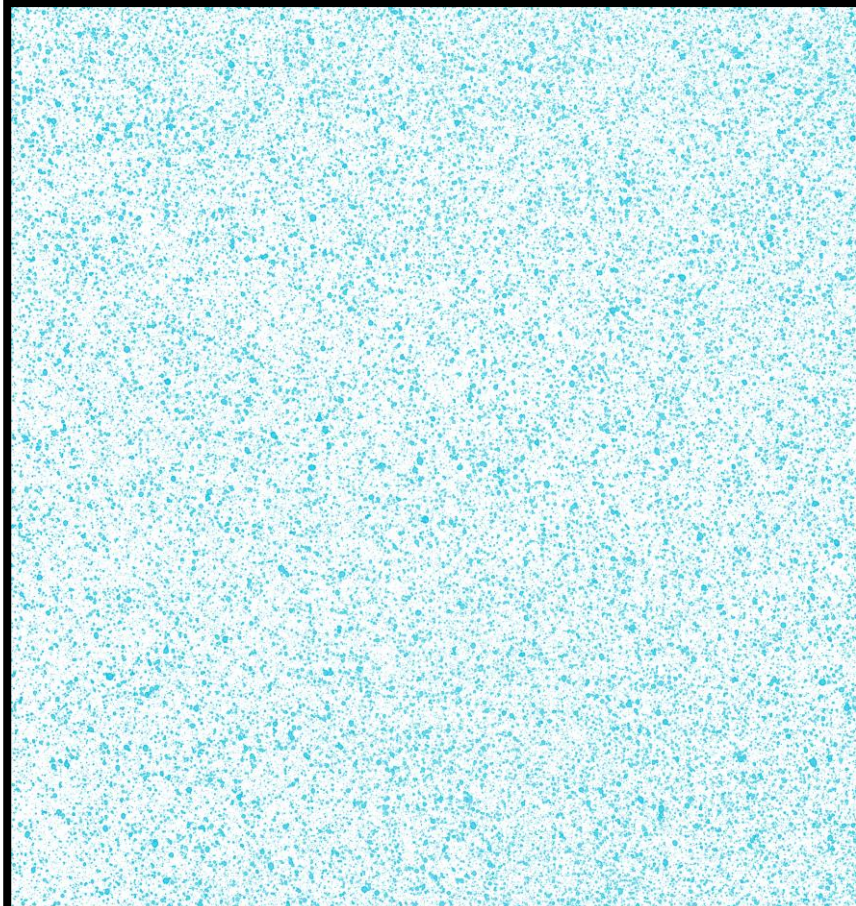
Droplet size	Spray Classification	Coverage
800 µm	Ultra Coarse	21.2 %



TTI – 15 GPA

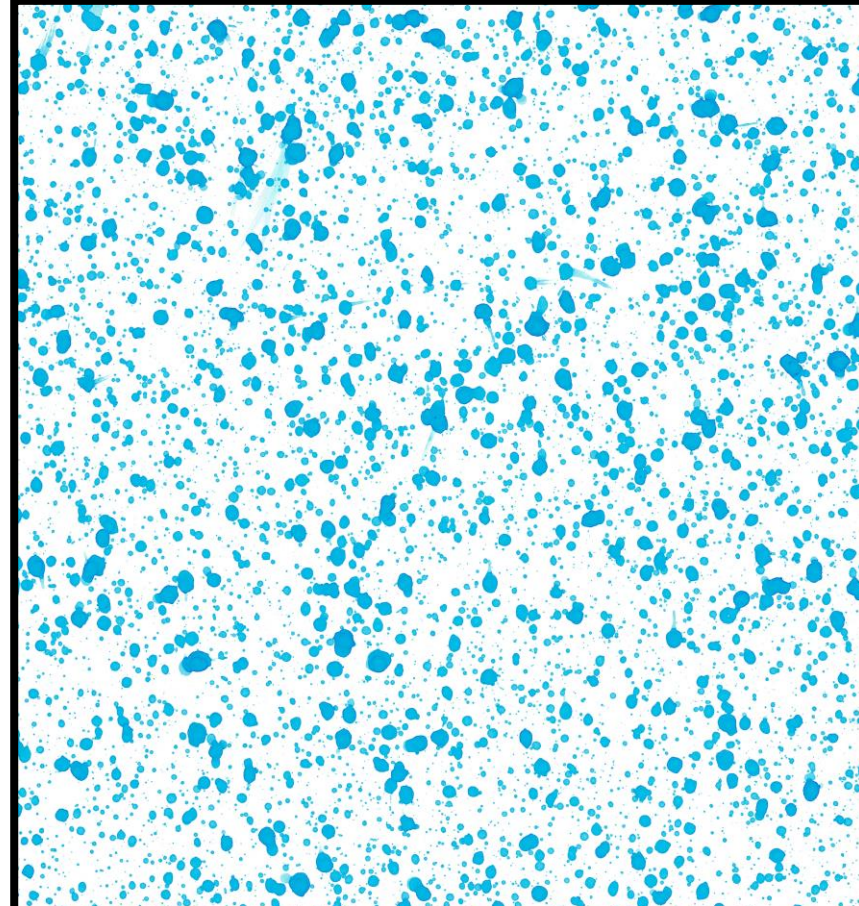
Droplet size	Spray Classification	Coverage
800 µm	Ultra Coarse	30.6 %

Spray Coverage (Comparison)



XR – 5 GPA

Droplet size	Spray Classification	Coverage
280 μm	Medium	19.9 %



TTI – 10 GPA

Droplet size	Spray Classification	Coverage
800 μm	Ultra Coarse	21.2 %

Spray Volume Effect on Weed Control



Liberty

Spray Volume Effect on Weed Control

5 GPA



20 GPA



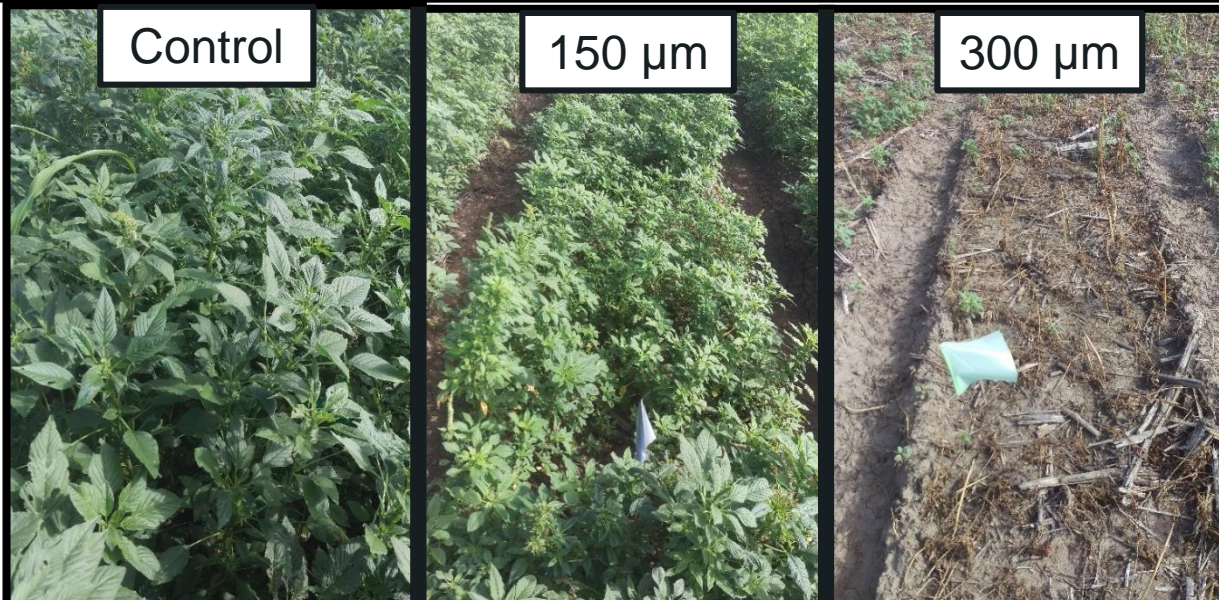
Dicamba

Droplet Size Effect on Weed Control

Liberty®

5 GPA

14 DAA



Droplet Size Effect on Weed Control

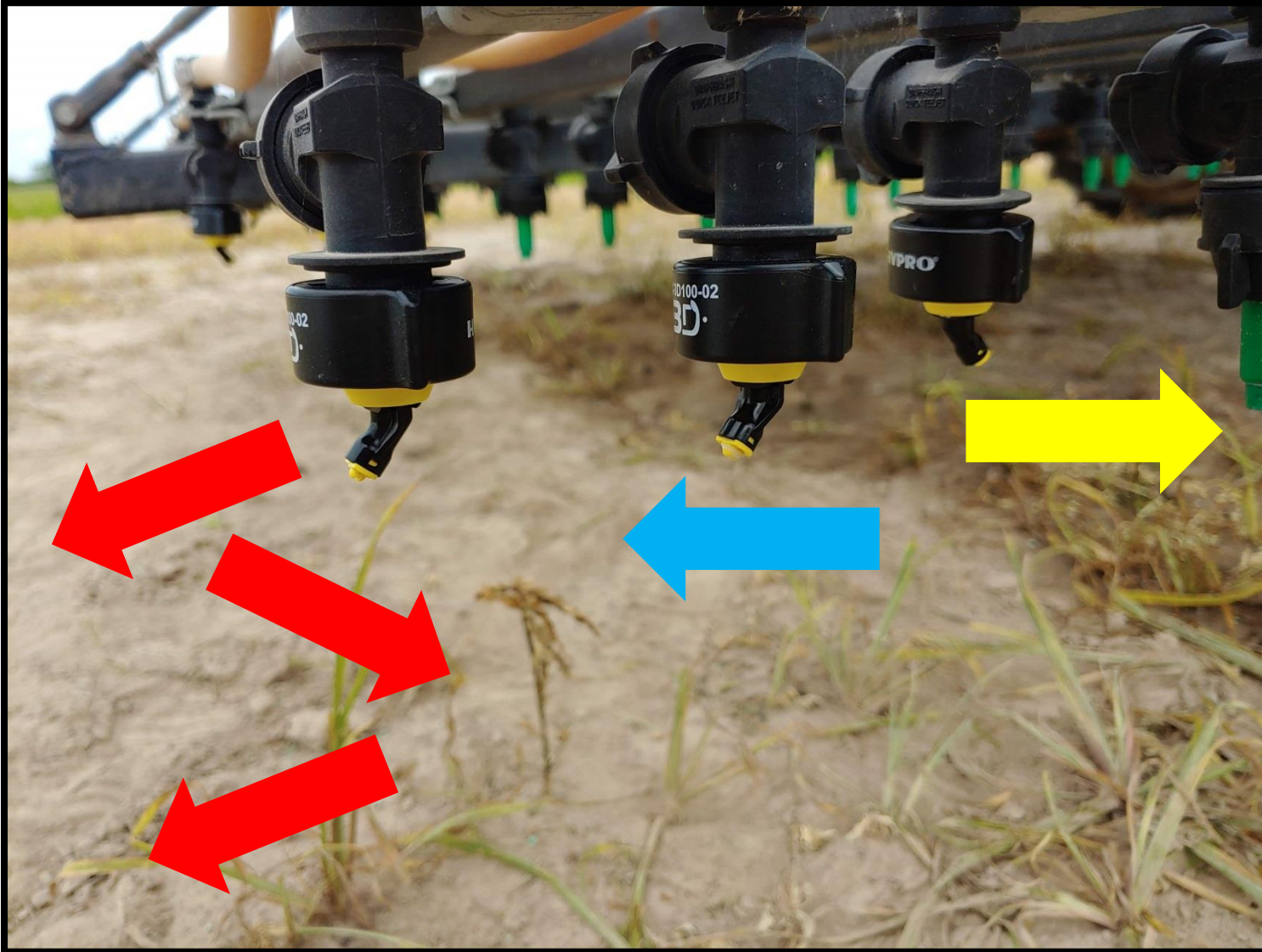
Dicamba

5 GPA

14 DAA



Nozzle Arrangement



1. All Forward

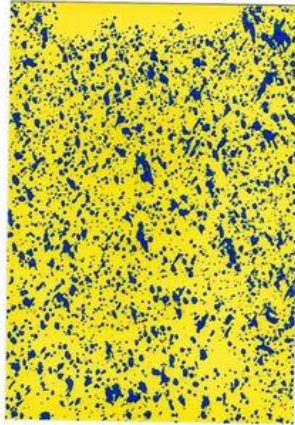
2. All Backward

3. Alternating

Nozzle Arrangement Effect on Coverage



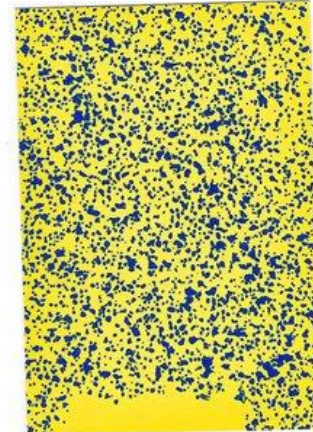
Top Coverage Cards



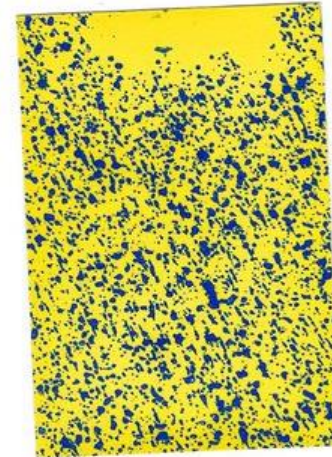
AIXR



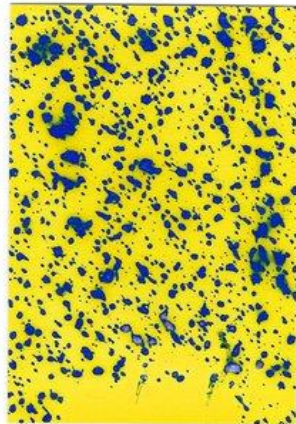
3D
Forward



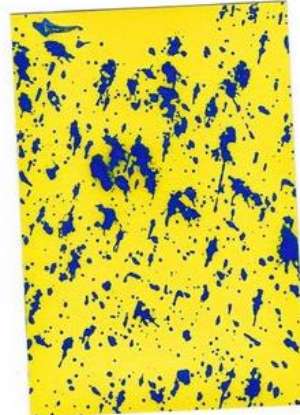
3D
Backward



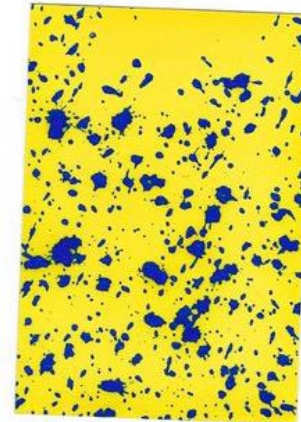
3D
Alternate



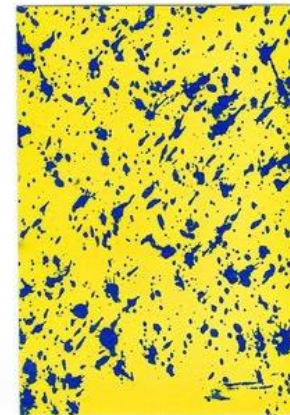
ULD



TTI
Forward



TTI
Backward

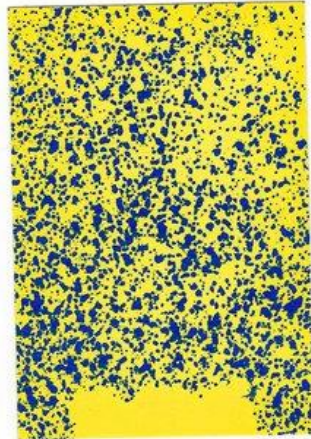


TTI
Alternate

Front Coverage Cards



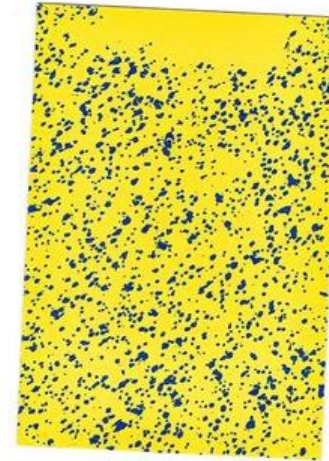
AIXR



3D
Forward



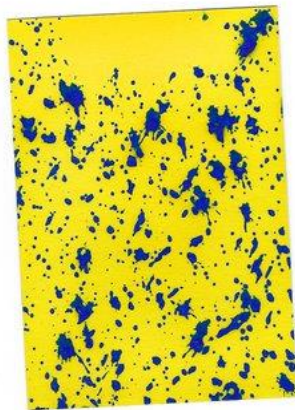
3D
Backward



3D
Alternate



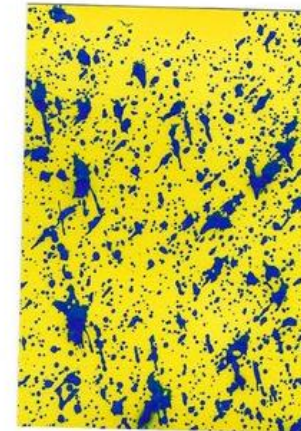
ULD



TTI
Forward



TTI
Backward



TTI
Alternate

Back Coverage Cards



AIXR



3D
Forward



3D
Backward



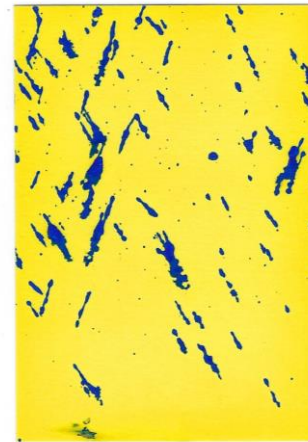
3D
Alternate



ULD



TTI
Forward



TTI
Backward



TTI
Alternate



To **increase** our droplet size (reduce our drift potential) should we:

Increase Pressure



Decrease Pressure

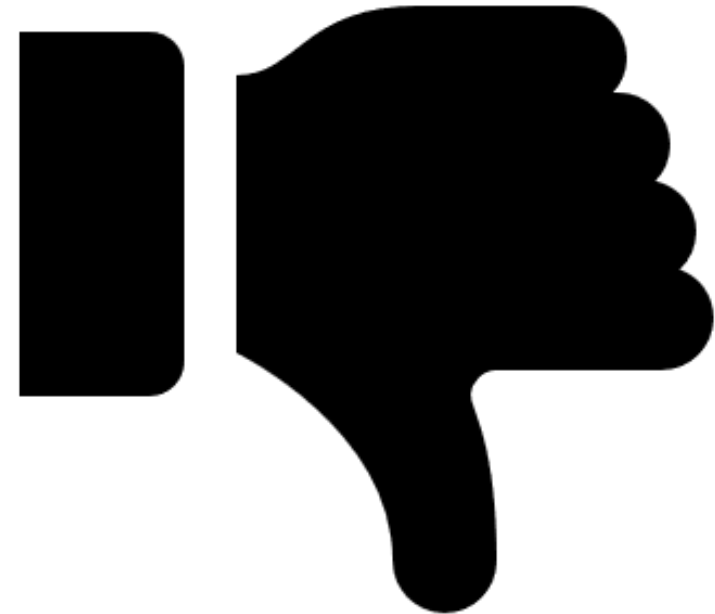


To **increase** our droplet size (reduce our drift potential) should we:

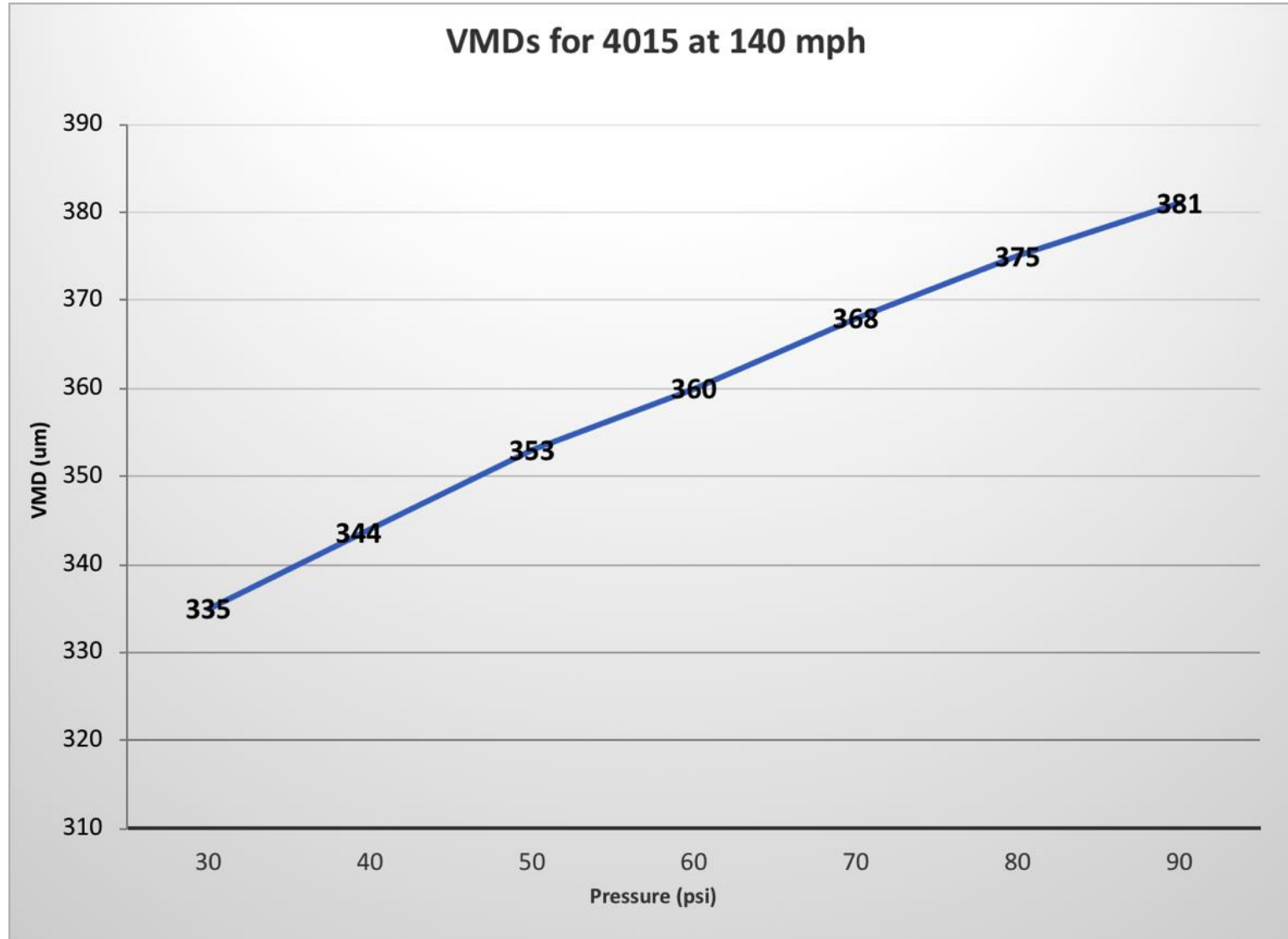
Increase Pressure



Decrease Pressure

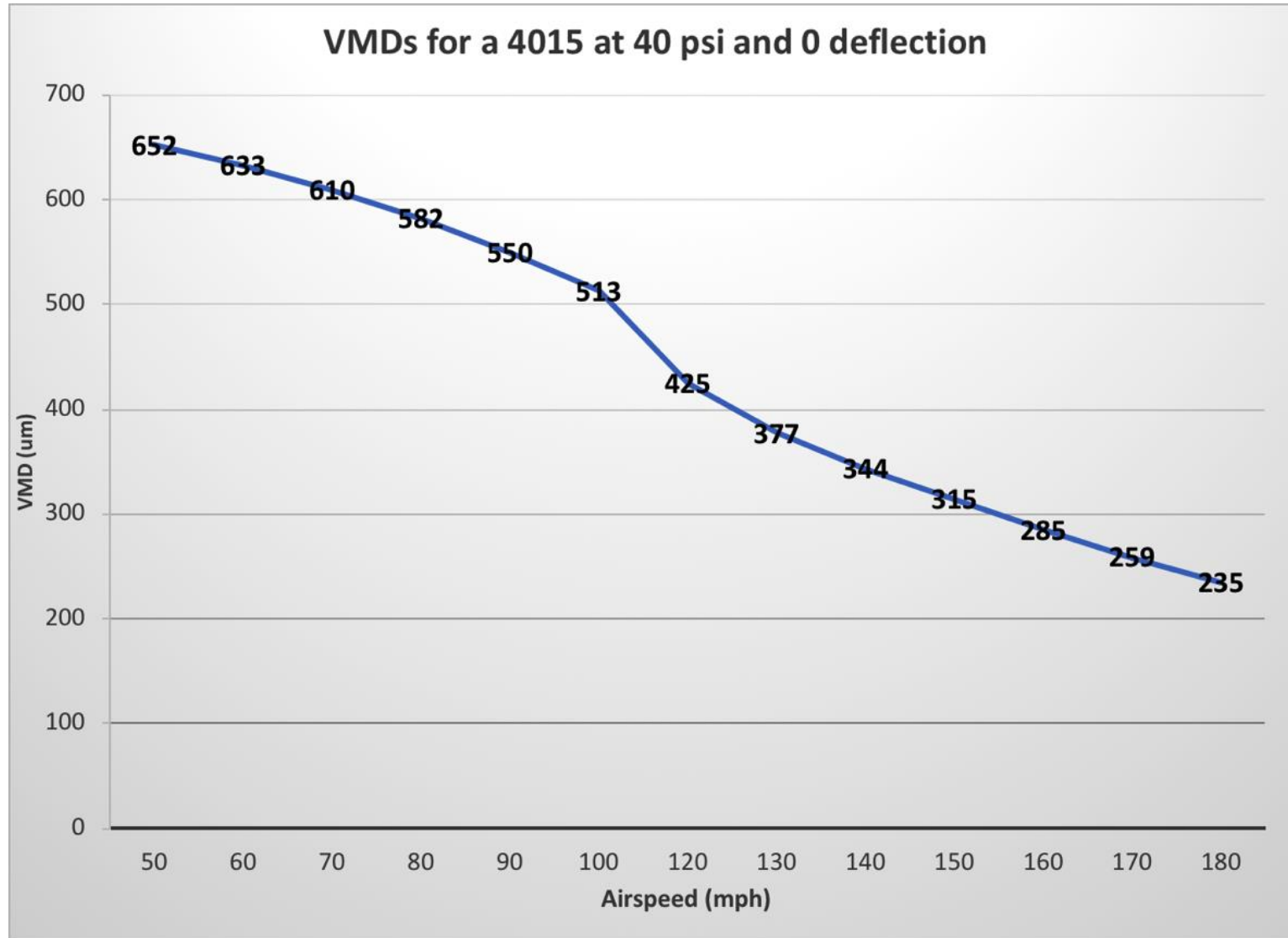


Pressure Effect on Droplet Size



Courtesy of
Bradley Fritz
(USDA-ARS)

Airspeed Effect on Droplet Size



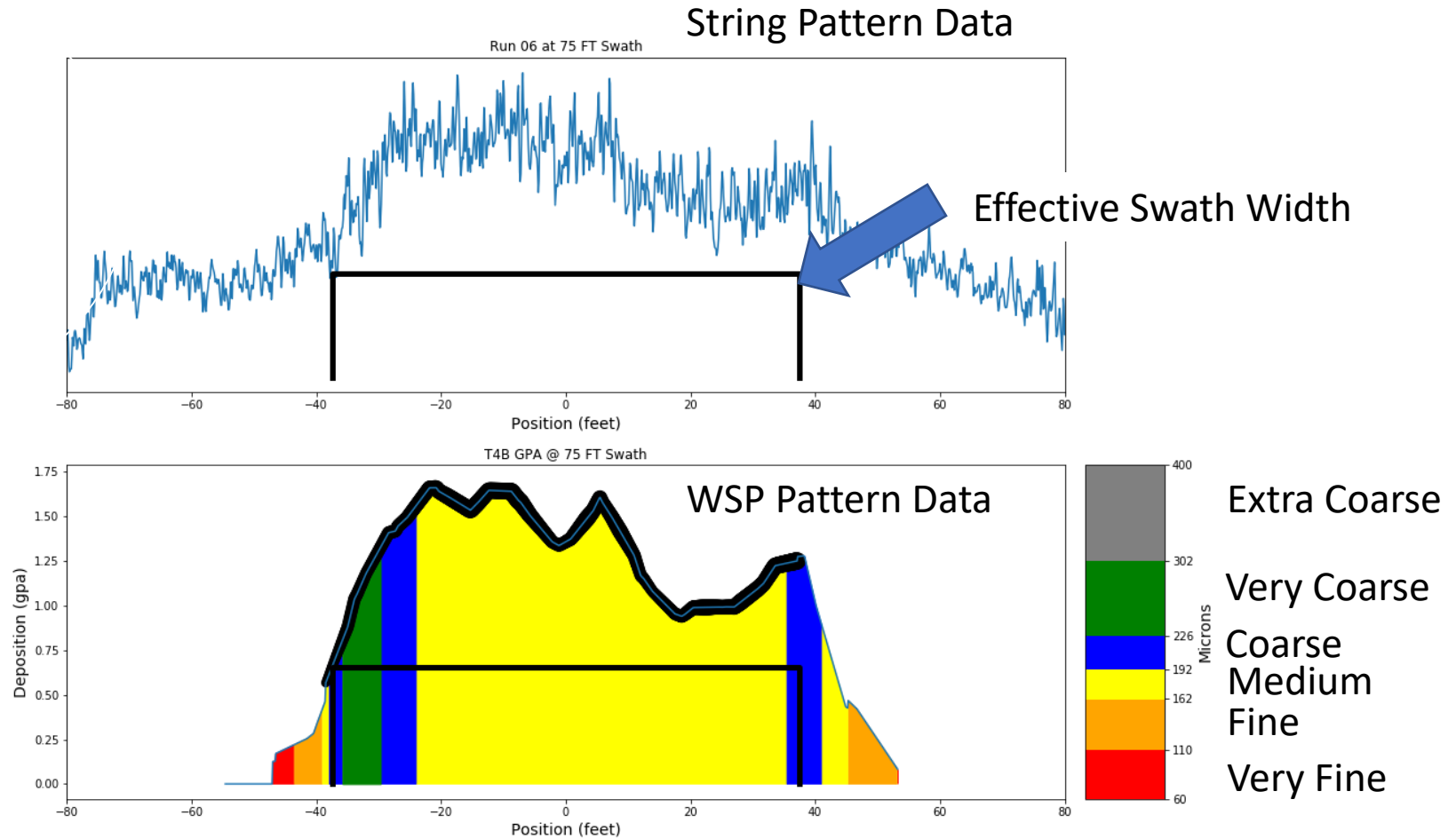
Courtesy of
Bradley Fritz
(USDA-ARS)

Aircraft Payloads



	Boeing 737	C-130 Hercules	Boeing C-17	Cessna 172	AT-802A
Maximum Take-off Weight (lbs.)	175,000	155,000	585,000	2,500	16,000
Payload (lbs.)	45,000	45,000	171,000	800	9,500
% max weight dedicated to payload	26%	29%	29%	32%	59%

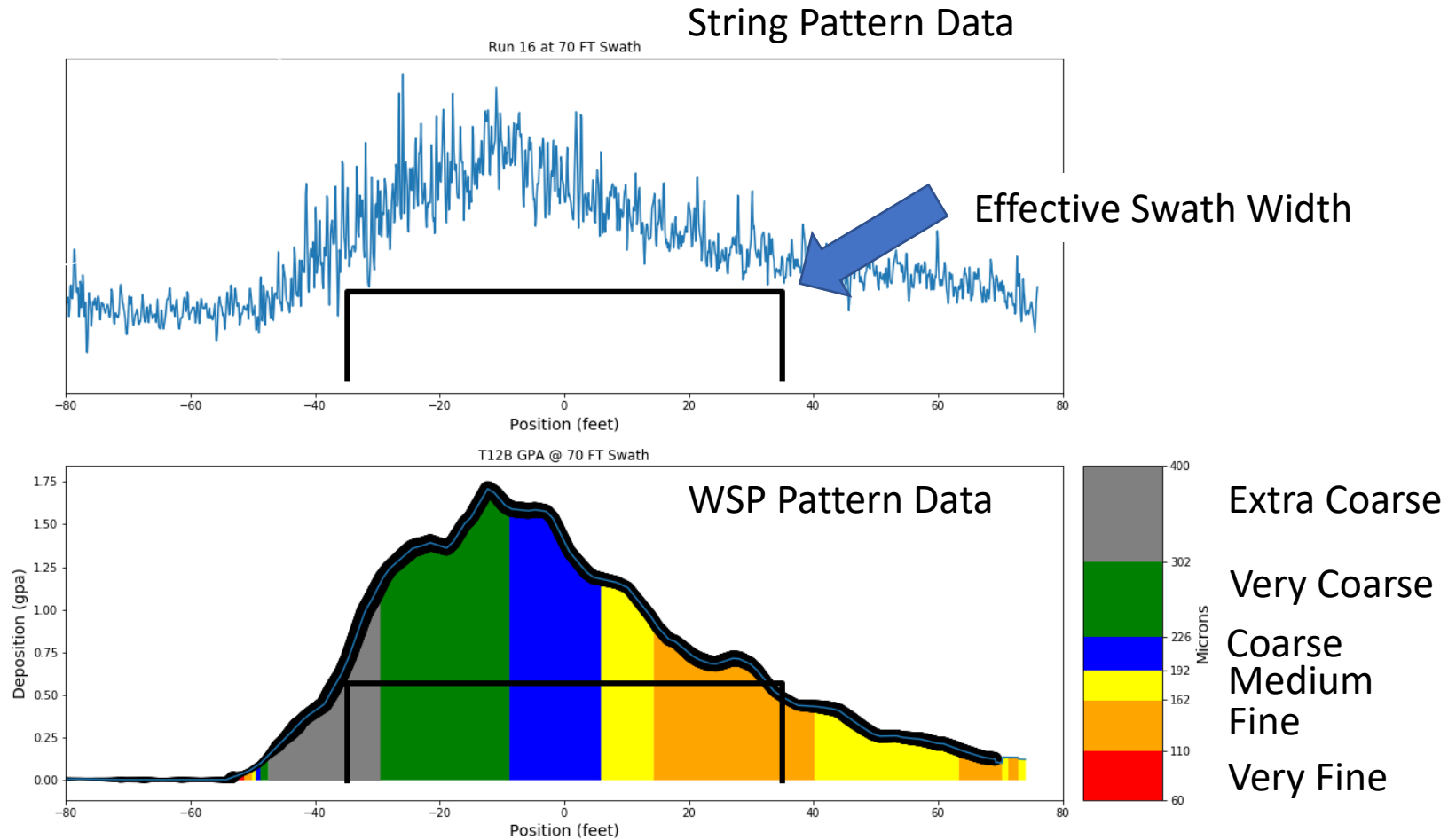
In-Wind



Courtesy of Bradley Fritz (USDA-ARS), Matt Gill (University of Illinois), and Scott Bretthauer (NAAA)

Swath and Droplet Size Displacement

Cross-Wind



Courtesy of Bradley Fritz (USDA-ARS), Matt Gill (University of Illinois), and Scott Bretthauer (NAAA)

- Do the little things when it comes to pesticide applications...
 - They can quickly add up and make or break the application!
- Droplet size, spray volume, and nozzle arrangement are important factors (among others) when it comes to coverage and pest control.
- Goal of aerial applications is the same, but they are extremely different processes than ground applications.
- Aerial applicators face numerous challenges but are still capable of making highly successful pesticide applications.



Just Don't Forget About the Application Process!

- University of Arkansas Weed Science Group
- Arkansas Rice Research and Promotion Board
- Arkansas Soybean Promotion Board
- University of Arkansas System Division of Agriculture
- Brad Fritz, Phil Jank – USDA ARS Aerial Application Technology Unit
- Matt Gill, University of Illinois
- Scott Bretthauer, National Aerial Applicator's Association
- UNL Pesticide Application Technology Lab

Thank you! Questions?



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