

Improving Spray Deposition in Blueberries

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The optimize deposition of pesticide's active ingredient onto the blueberry bush plant surface is a critical component in the spray application process and control of blueberry pests.

Spray penetration through the blueberry plant canopy is of key importance to the spray deposition, and is necessary for uniform distribution of the spray material inside the canopy to get proper pest control. The blueberry bush canopy characteristics can place a significant limitation on the application and spray deposition. Canopy characteristics like shape, size, and density all play a major role in spray deposition. As the spray droplets penetrate the blueberry bush canopy, even the characteristics of the leaves play an important role in influencing efficient application.

Improving spray deposition in blueberries starts with selecting the right sprayer with proper air movement to optimize deposition of pesticide on and into the blueberry bush. Along with selecting the right sprayer, growers must prune blueberry bushes to optimize spray application. The sprayer must be calibrated and the spray pattern must be adjusted to allow for good spray coverage, minimizing spray drift and off target application. Spray application needs to be applied when weather conditions are conducive to minimizing spray drift.

Accurate application rates and effective pest control can be difficult to maintain with poorly maintained or incorrectly calibrated sprayers. Calibration is an efficiency tool often overlooked and under used by many growers. Over time, all types of nozzles are impacted by wear and tear, and the nozzle orifices get bigger, increasing the desired or calibrated output. Uneven wear can lead to poor spray patterns and uneven control or even crop damage.

Calibrating a sprayer a couple of times a season based on the blueberry bush growth can allow a grower to be more accurate with application rates. Typically a lower rate is used early in the season with an increase in carrier volume as the bushes grow. This results in growers using less chemicals to get the desired pest control. This not only saves the producer money but shows due diligence when it comes to protecting the environment.

Good coverage of active ingredient(s) on the blueberry bush is an essential requirement for effective pest management. Effective penetration of the spray into a dense canopy can be achieved by utilizing proper air movement/air-streams. Installing air deflectors at the air outlets added a slight upward motion to the air-streams and can enhanced spray deposition in the

blueberry bush. Use of water-sensitive paper is a useful tool for assessing the spray coverage and penetration. When spray droplets (water) comes in contact with the paper, it turns blue, and spray droplets become visible. The visible pattern can be used as a guide to assess approximate coverage of a spray under field conditions.

Factoring affecting spray deposition:

1. Plant Canopy Characteristics (Growers manipulated by pruning)
 - a. Plant density
 - b. Plant shape
 - c. Plant size
 - d. Plant growth
 - e. Time of year

2. Weather Condition (Growers determine when to spray)
 - a. Wind
 - b. Relative humidity
 - c. Temperature

3. Pesticide (Growers what to use to spray)
 - a. Formulation
 - b. Adjuvants

4. Sprayer (Growers select or purchase sprayer)
 - a. Droplet sizes
 - b. Pressure
 - c. Nozzle type
 - d. Nozzle tip size
 - e. Rate of water/carrier per acre
 - f. Type of Air Movement
 - i. Air blast
 - ii. Air shear
 - iii. Hydraulic
 - g. Air movement pattern

5. Calibration and spray pattern evaluation (Growers determine how to accomplish)