APPLICATION EFFICIENCY OF THREE DIFFERENT TYPES OF SPRAYERS IN WESTERN PACIFIC NORTHWEST BLUEBERRIES

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Effective and target specific agricultural sprayer applications are some of the major factors to achieve better pest management. Such factors also govern cost of the pest management to the growers and associated impact to the orchard ecosystem. . In order to reduce the off target drift and for improved sprayer application efficiency, one needs to consider effective sprayer designs, appropriate nozzles and orientation adjustments for desired spray pattern, and use of appropriate spray adjuvants.

Therefore, this study investigated three different types of sprayers towards their applications efficiency in blueberry crop production management. An airblast, Cannon sprayer, and Electrostatic, were evaluated in this study. The application treatments were performed with water soluble Pyranine 10G® fluorescent tracer as spray mix. To compare each of the sprayers' efficiency, deposit and spray drift samplers from the respective treatment row canopy zones and adjacent row middles (air and ground drift samplers) were analyzed using fluorometry technique.

Preliminary results showed that all three sprayers were effective in terms of coverage (spray deposition) at each canopy zone in blueberries. The Electrostatic sprayer displayed the highest levels of coverage followed by Airblast and then Cannon sprayer (Figure 1).

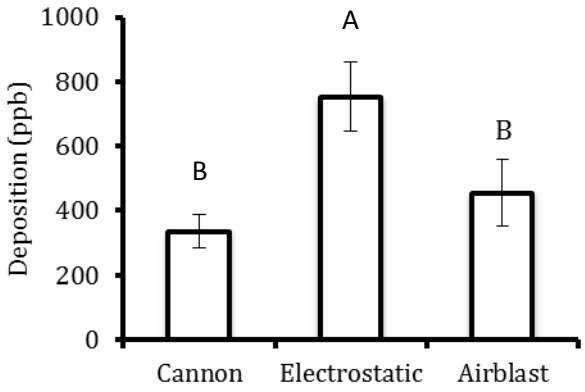

Figure 1. Spray deposition of all spray zones combined on blueberry plants (different letters show significant difference at 5% level)

The aerial spray drift analysis, displayed increased levels of tracers in all of the measured zones combined for Cannon and Airblast sprayers. Significantly decreased spray material drift was observed for the field applications using the Electrostatic sprayer (Figure 2).

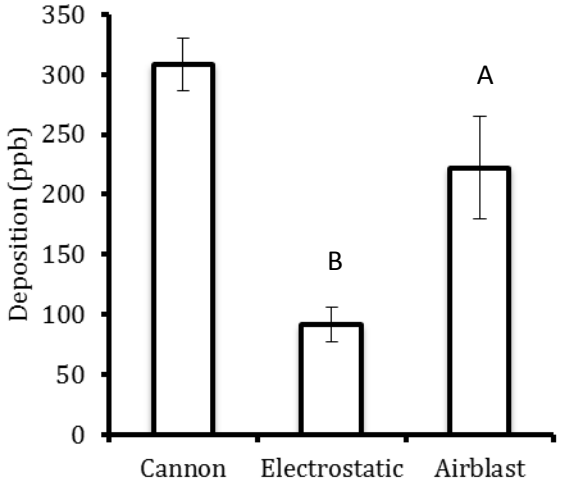

Figure 2. Comparison of in-field aerial drift deposition levels in blueberry plants (different letters show significant difference at 5% level)

In-field ground drift samplers analysis indicated that high levels of spray material were deposited in the Airblast sprayer followed by the Electrostatic sprayer and the Cannon sprayer (Figure 3).

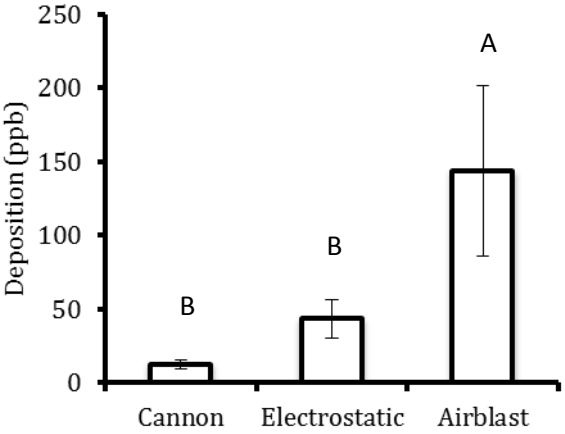

Figure 3. Comparison of in-field ground drift (different letters show significant difference at 5% level)

Increased aerial drift results are expected for the Cannon and Airblast sprayer. This is because Cannon designed to get increased spray coverage over several rows. Previous results show that this sprayer can be used with some success when doing border spray applications. Airblast sprayers are designed to use large volumes of air movement in order to get improved coverage of the target areas. Such design may also results in increased aerial drift d and a numerically higher level of coverage over the Cannon sprayer. Electrostatic sprayers are designed to provide coverage by applying compounds in every row. Experiments were conducted under ideal conditions during the period of the treatments and were 60-75°F and 0-3 mph wind speed and 50-75%, respectively. Results may vary dependent on an increased wind speeds, temperature, and humidity. These results are preliminary and additional results are needed under other environmental conditions. The results indicate advantages and shortcomings for all of the sprayers tested. Growers can use these results in order to provide the best management options for their unique conditions.