THE EFFECT OF HERBICIDES, ADJUVANTS AND NOZZLE TIPS ON SPRAY PARTICLE SIZE.

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Spray particle size is the major factor in pesticide application affecting pesticide efficacy and spray drift. In 1987, the British Crop Protection Council adopted the spray droplet classification primarily to enhance efficacy. They use the term Spray Quality for droplet size categories. In 2000, the American Society of Agricultural Engineers Pest control and Fertilizer Committee developed ASAE S572, Spray Nozzle Classification by Droplet Spectra, primarily to control spray drift. This standard defines spectrum categories for the classification of spray nozzles, relative to specified reference fan nozzles discharging spray into static air, or so that no stream of air enhances atomization. The droplet spectra produced by single elliptical orifice reference nozzles with specified liquid mixture, flow rates, operating pressures and spray angles, are specified by the standard to establish the threshold of division between nozzle classification categories. The standard is based on spraying water through the reference nozzles and the nozzles to be classified. However, spray solution properties may affect droplet sizes.

Research has been conducted with a Sympatec Helos KF Analyzer. The system uses laser diffraction to determine particle size. With the R6 lens, it can determine particle sizes in a large range from 0.5 to 1230 microns. The nozzle tips are mounted on a boom with an electric linear actuator which moves the entire spray plume through the laser beam. A study was done to determine the particle size and distribution of glyphosate and ammonium sulfate with and without different adjuvants. Spray Systems Extended Range, Turbo TeeJet, Turbo Flood, Air Induction, and Air Induction Extended Range nozzles were evaluated. Both the herbicide and adjuvants affected particle size. Some nozzles are affected more than others, and would result in the nozzle receiving a different droplet spectra classification.

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