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DROPLET SIZE AND DRIFT

Drift is the number one complaint resulting from crop and horticultural pesticide applications. University of Nebraska research is helping in the development of simple systems to assist in optimum pest control with the least drift potential.

Research to help in reducing risks is being done at North Platte, Neb., where two wind tunnels were put in place by the University of Nebraska with financial support commodity organizations and private corporations. A high-speed wind tunnel can evaluate aerial application technology in winds up to 210 miles per hour, and the low-speed wind tunnel can evaluate ground rig application products in winds up to 15 miles per hour.

"We're really trying to understand what the (pesticide) droplet size looks like under various application conditions—different nozzle selection, different orifice sizes, varied applicator pressures—and how that translates into off-target movement. And then taking those same parameters, how does that translate into pesticide efficacy?," explained Greg Kruger, University of Nebraska, assistant professor, cropping systems specialist, working at the West Central Research and Extension Center.

The work being done by Kruger is aimed at determining what droplet size provides the best efficacy for pesticides currently on the market. Besides there being hundreds of registered pesticides, the research is complicated by how adjuvants change the droplet size and weed control efficacy. Pesticides in mixture, in the majority of cases, come through spray nozzles in different droplet sizes than water sprayed alone.

"I think the key is to try and find a trend in the data. We are starting to get there. The reality is that we will never be able to address every individual applicator situation because there are so many variables. But we think there are things we can do to understand how flat fan nozzles behave compared to turbo chamber nozzles versus air-induction nozzles. I think there are trends we can pick out in terms of adjuvants, too. Every company has their own adjuvant, but if you break it down all those adjuvants fall into a few similar classes—non-ionic surfactants, crop oils, methylated seed oils, polymers, micro-emulsions and others." Kruger said.

Coarse droplets will in general limit drift, but if a pesticide is not going to perform when applied with the wrong droplet size, there is no justification for the farmer using the product.

This type of research is even more valuable when the weed control industry is returning to herbicide combinations and multiple timing of applications to control glyphosate resistant weeds. Information from Dr Kruger's research is already available to pesticide applicators in the University of Nebraska Lincoln "2013 Guide for Weed Management" in a section called Nozzle Selection for Droplet Size. The information is also available for iPhone or Android phone app. The app can be found by searching the iTunes or Google Play Store with the key words of ground spray.

Spray drift reduction is achievable by following the pesticide label, understanding the causes of spray drift, equipment functions to reduce drift, and good communications between all parties involved in the application and neighbors with specific pesticide restrictions.

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