

Optimizing Drone Spray Applications with Organosilicone Adjuvants

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Summary

Drones were originally introduced to agriculture for monitoring crops, where they can help assess deficiencies in water, nutrients and pest control. However, new automated spray systems were developed over the last several years, enabling the use of drones for spraying crops. This represents a great advancement for small farmers who would otherwise rely on backpack applications. Drones offer them improved efficacy and efficiency, saving on labor and greatly reducing the time it takes to spray their crops. However, they also pose some new challenges as ultra-low spray volumes can lead to incompatibility issues for spray mixtures, which can result in poor coverage and reduced efficacy. The very fine drops generated by the extended range nozzles typically used in drones are prone to drift and more susceptible to fast evaporation. Therefore, the use of adjuvants is critical for consistent performance and the ability to spray crops under less favorable weather conditions. Organosilicones can be advantageous in these applications because of their characteristic properties, notably singularly low surface tension and their superspreading ability. During this talk, we will present a quick review of this class of spray adjuvants and how they can contribute to improved applications, when combined with this new spray technology. We will discuss for example the effect of a trisiloxane alkoxylate surfactant (TSA) on mixtures reproducing drone spray conditions. We investigated how a TSA affects ultra-low spray volumes (15 L/ha), determining its effect on the spreading (on cabbage) and uptake of concentrated pesticide sprays (e.g. 20% a.e. active of Glyphosate on Barley). We have also determined the adjuvant effect on the uptake of concentrated Propiconazole solutions into Barley, while also comparing the performance for the unformulated technical versus the formulated product (i.e. Propiconazole vs. Fitness™). Additionally, we will cover recent field trial results on a variety of crops, where we determined the adhesion, pest control and yield. Overall, we observed greatly improved coverage and superior uptake for both the technical and formulated products, with the ability to adjust the penetration and spreading levels according to the adjuvant use rate, and enhanced deposition and efficacy in the crops tested.