

## **Efficacy of an Avian Repellent Applied Using Drop Nozzle-Equipped Ground Rigs in Reducing Blackbird Damage to Sunflower**

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**ABSTRACT:** In North Dakota large flocks of blackbirds feed on ripening crops, after breeding and prior to migration, resulting in an annual damage estimate averaging \$3.5 million for sunflower. Since the repellent needs to be ingested to be effective, one obstacle is applying sufficient repellent directly to the sunflower face. Thus, we tested efficacy of an anthraquinone-based repellent when applied via drop-nozzle to sunflower using enclosed blackbirds in a semi-natural field setting. We used a ground-rig equipped with 360 Undercover® drop nozzle sprayers to apply 20 gal/ac of solution to sunflower plots with a product application rate of 1.0 gal/ac (13% AQ). To test efficacy, we installed bird enclosures (12 x 13 x 10 ft) to house 10 captive, male red-winged blackbirds (*Agelaius phoeniceus*) for 23 days on 10 treated and 10 untreated plots. The repellent did not cause birds to consume more alternative diet (i.e., red milo). Sunflower yield did not differ between treated and untreated enclosures as a result of blackbird damage. Variation in the amount of repellent reaching the face of the sunflower and subsequent residues was a limitation of the application method. Efficacy may be improved by increasing the application rate or repellent in the tank mixture, but sprayer technology and economic limitations related to repellent costs need to be considered. Future studies should aim to optimize the amount of product in tank mixtures and the repellent formulation as designed for specific pests and crops.

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