DOES VOLATILITY OF ENLIST ONE POSE A RISK TO NON-ENLIST COTTON?

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Abstract

In the 2018 and 2019, off-target movement of 2,4-D choline injured adjacent susceptible cotton; understanding how 2, 4-D choline moved off-target may lead to actions that mitigate the risk for off-target movement. An experiment to evaluate the mechanisms of movement of a commercial application of Enlist One to sensitive cotton was conducted on August 8, 2018 at the Lon Mann Cotton Research Station, near Marianna, AR and on August 14, 2019 in Keiser, AR. A one-acre area was treated with Enlist One (2,4-D choline) at 1 qt/A + Liberty (glufosinate) at 1 qt/A in the center of a 10-acre field of XtendFlex (2,4-D susceptible) cotton. Before herbicide application, buckets were placed over marked susceptible plants in 25 foot increments in the downwind direction to edge of the field. The buckets were removed 30 minutes after application. Arial photos including RGB and NDVI were taken to mark any drift that may have occurred. High volume air samplers were placed in the center of the treated area and directly outside of the treated area on all four sides of the field 30 minutes after application. Sampling media (filter paper and PUFs) were replaced in the high volume air samplers every 24 hours after application up to 72 hours. Cotton plants in the field in the downwind direction that were covered by buckets up to 30 minutes after application showed no signs of 2,4-D injury whereas uncovered plants were injured 55 to 75%, in both years. The NDVI and RGB photos showed that Enlist One did move out of the treated area injuring susceptible cotton only on the downwind side of the field at time of application. The data collected from the air samplers shows that 2,4-D choline did volatize at a rate of 1257 ng from inside the treated area 23.5 hours after the application; however, injury to susceptible cotton from volatilization of 2,4-D choline did not occur. Based on these findings, it is concluded that injury to nearby non-Enlist cotton from an Enlist One + Liberty application is most likely the result of physical drift and there is little risk for injury caused by volatilization.