EFFECT OF HERBICIDE PROGRAM, SPRAY DROPLET SIZE, AND DRIFT REDUCTION AGENT USE ON GLUFOSINATE EFFICACY

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Abstract

Increasing interest has been placed on managing spray droplet size of herbicide applications to mitigate off-target movement. Drift reduction agents (DRA) have been recommended to reduce driftable fines in the spray pattern. A study was conducted in 2019 near Dundee, MS to evaluate Palmer amaranth (*Amaranthus palmeri*) control with glufosinate and with and without a DRA. The study was conducted using 2 x 2 x 6 factorial arrangement of treatments in a randomized complete block design with four replications. Deltapine 1646 B2XF was seeded at 111,000 seed ha^{-1} on June 20. Factors included: A) PRE of fluometuron at 1.1 kg ai ha^{-1} and no PRE; B) six spray droplet sizes of 150-900 microns in increments of 150 microns; and C) Intact™ at 0.5% v v^{-1} and no Intact™. All treatments received glufosinate at 0.59 kg ai ha^{-1} when Palmer amaranth reached 10-15 cm in height. Herbicide applications were made with a pulse width modulated sprayer using Wilger™ flan fan, non-venturi tips at a speed of 14.5 km hr^{-1} and carrier volume of 140 L ha^{-1}. Data were subjected to analysis of variance using the PROC GLM procedure in SAS v 9.4. Means were separated using Fisher's Protected LSD at $\alpha = 0.05$. Driftable fines were reduced by 23% when Intact™ was added to the tank mix and as volume median diameter of droplet size increased, driftable fines decreased. There was a negative linear trend in Palmer amaranth control at 7 and 14 DAA ($p < 0.01$). Smaller droplet sizes provided the greatest Palmer amaranth control. Palmer amaranth density was also greatest where larger droplet sizes reduced herbicide efficacy. In conclusion, although the fine droplet size (150 micron) provided the greatest control of Palmer amaranth, a medium droplet size (300 microns) will reduce drift potential without sacrificing herbicide efficacy.