IMPACT OF REDUCED RATES OF MESOTRIONE ON COTTON GROWTH AND YIELD

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Abstract

Crops grown in close proximity along with similar equipment utilized in multi-crop farming operations come with many potential challenges involving off-target movement of herbicides or sprayer contamination. These added concerns justify research identifying possible deleterious effects on high value crops such as cotton. Therefore, field studies were conducted in 2018 at the Northeast Research Station near St. Joseph, La with the objective to evaluate potential negative impacts of reduced rates of mesotrione on cotton growth and yield. A four-replication factorial arrangement of treatments was used and included herbicide application timing (Factor A: cotyledon; 2 lf; or 4 lf) and herbicide treatment (Factor B: no herbicide or mesotrione @ 1x (0.156 lb ai/A), 1/8x, or 1/16x). Treatments were applied at designated timings following planting of ST5517GLTP cotton on 5/8. Parameter measurements included visual crop injury 7 and 14 d after application (DAT), crop height 14 and 28 DAT as well as prior to harvest, and yield.

At 7 DAT, greatest injury was observed with the 1x herbicide rate at the cotyledon (51%), 2 lf (79%), and 4 lf (35%) application timings. At the 1/8x and 1/16x herbicide rates, differing injury was noted at the cotyledon (36 and 26%, respectively) and 2 lf (55 and 36%, respectively) application timings. At the 4 lf application timing, injury was equivalent for the 1/8x (18%) and 1/16x (15%) herbicide rates. At 14 DAT, again greatest injury was observed with the 1x herbicide rate at the cotyledon (85%), 2 lf (85%), and 4 lf (63%) application timings. At the cotyledon application timing, injury was equivalent for the 1/8x (6%) and 1/16x (3%) herbicide rates. At the 1/8x and 1/16x herbicide rates, differing injury was noted at the 2 lf (40 and 21%, respectively) and 4 lf (29 and 20%, respectively) application timings.

At 14 DAT, cotton height at the cotyledon application timing was reduced only at the 1x rate (46%). At the 2 lf application timing, the 1x, 1/8x, and 1/16x herbicide rates resulted in significant and different height reduction of 45, 33, and 24%, respectively. At the 4 lf application timing, height was reduced at the 1x (17%) and 1/8x (9%) herbicide rates. At 28 DAT, averaged across application timing, greatest height reduction was observed at the 1x herbicide rate (33%) with significant and equivalent reduction noted among the 1/8x (13%) and 1/16x (8%) herbicide rates. Prior to harvest, when averaged across application timing, a significant height reduction was noted only at the 1x herbicide rate (19%). Averaged across herbicide rate, height was lowest at the 2 lf (112 cm) application timing in comparison to the cotyledon (120 cm) and 4 lf (123 cm) application timings.

Averaged across application timing, a significant yield reduction was noted only at the 1x herbicide rate (53%). Averaged across herbicide rate, yield was lowest at the 2 lf (2425 lb/A) in comparison to the cotyledon (2866 lb/A) and 4 lf (3025 lb/A) application timings.