EFFECTS OF PLANT-BACK INTERVAL AND TILLAGE ON COTTON TOLERANCE TO WARRANT (ME ACETOCHLOR)

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Abstract

Preemergence herbicides are critically important for early weed control in cotton. Warrant (microencapsulated acetochlor; ME) is a common preemergence herbicide used in cotton production to control troublesome weed species such as Palmer amaranth (*Amaranthus palmeri*). Field research was conducted near Rocky Mount and Lewiston, North Carolina to evaluate cotton tolerance to ME acetochlor applied 4, 3, 2, or 1 weeks before planting (WBP) across three tillage systems. Tillage systems included no-tillage, strip-tillage, and conventional-tillage. ME acetochlor was applied to bare soil at a rate of 1260 g ai ha^{-1} with a CO_2-pressurized backpack sprayer delivering 140 L ha^{-1}. Cotton was planted on 91 cm rows just after tillage treatments were performed. Visual estimates of cotton stunting and height were collected at first emergence, 14, 21, 28 and 42 days after planting (DAP). Cotton height was collected 28 and 42 DAP. Cotton biomass was collected at 28 DAP. Cotton was harvested and weighed in October to determine yield. All data was subject to SAS version 9.4 using GLIMIX with α=0.05. At Lewiston, treatment differences were minimal due to hot and dry conditions during the start of the growing season. Tillage, timing, and the interaction between the two were not significant. At Rocky Mount, tillage and timing were significant while the interaction was not therefore, data presented is from this location. Cotton stand across tillage systems 21 DAP was 123, 118 and 112 for no-till, strip-till, and conventional-till, respectively. Across application timing 21 DAP, cotton stand was 144, 128, 115, 101 and 101 for the untreated, 4, 3, 2 and 1 WBP applications, respectively. 2 and 1 WBP applications reduced lint yield by 24 and 30%, respectively. This research demonstrated that cotton stand and yield will be reduced as the time between Warrant application and planting decreases from 4 to 1 WBP, regardless of tillage system.