WEED MANAGEMENT WITH RESIDUAL HERBICIDES IN COTTON

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Abstract

Cotton producers are faced with the ever-growing issue of herbicide resistance. Herbicide resistant weeds, such as Palmer amaranth, can be highly detrimental in terms of growth and yield of cotton. Previous studies have shown that cotton lint yield decreases as Palmer amaranth populations increase. An effective residual herbicide, applied preemergence, allows the crop time to emerge and outgrow predacious weeds. Previous research has shown that combining modes of action when applying residual herbicides increases weed control. The following trials were conducted to better understand the potential for Staple herbicide based preemergence combinations for weed management programs in XtendFlex and Enlist cotton. Experiments were conducted at two locations in Oklahoma in 2019 and 2020, the Oklahoma State University Caddo research station near Fort Cobb and the Southwest Research and Extension Center near Altus. XtendFlex and Enlist cotton were planted in separate trials at each location in May of each year. Plots were 4 rows by 25 ft long. Treatments were arranged in a randomized complete block, and included: Cotoran (32 fl oz/A), Caparol (2.4 pt/A), Direx (32 fl oz/A), Sinister (1 pt/A), Warrant (3 pt/A), and Staple (1.3 fl oz/A) applied alone as a PRE. These herbicides were also applied at a half rate in combination with a half rate of Staple. XtendFlex trials were followed by two POST applications of Engenia (12.8 fl oz/A) + Roundup (32 fl oz/A) + Dual Magnum (16 fl oz/A). Enlist trials were followed by two POST applications of Enlist Duo (75 fl oz/A) + Dual Magnum (16 fl oz/A). Visual injury and weed control were evaluated throughout the growing season and yield was calculated at harvest. In the XtendFlex trials, Palmer amaranth control, 2 WAP, was at least 93%, with all treatments in both years at Altus and in 2019 at Fort Cobb, while in 2020 at Fort Cobb, only 3 treatments provided similar levels of control: Cotoran, Direx, and Sinister alone. Following the POST 2 application, control of Palmer amaranth was at least 89% across all treatments and site years. The only treatment that controlled Texas panicum at least 95%, 4 WAP, at Fort Cobb both years was Direx alone, and control, following POST 2, was at least 94% with all treatments and locations. In the Enlist trials, Palmer amaranth control, 2 WAP, was at least 94% with all treatments both years at Altus and in 2019 at Fort Cobb. Only Cotoran, Direx, and Warrant alone and Direx + Staple provided similar control at Fort Cobb in 2020. Following POST 2, Palmer amaranth control was at least 97% across all treatments and site years. The only treatments that controlled Texas panicum at least 95%, 4 WAP, at Fort Cobb both years was Direx and Cotoran alone, and control, following POST 2, was at least 98% across all treatments and site years. All treatments increased cotton lint yield above the non-treated control. There were no differences in lint yield between any herbicide treatment in both cotton herbicide technologies in 2019 or the Enlist technology in 2020. This research indicated that Staple combination can provide similar control to single mode of action herbicide applied alone especially when combined with an effective POST program.