HERBICIDE SYSTEMS IN DICAMBA TOLERANT COTTON FOR DOWNWIND BUFFER FIELD AREAS

Michael W. Marshall
Clemson University
Blackville, SC

Abstract

The recent introduction of dicamba tolerant cotton has provided an additional herbicide technology tool for cotton growers. Dicamba is a growth regulator herbicide with good to excellent activity of broadleaf weeds, such as Palmer amaranth. However, there are several application restrictions on use of these new dicamba herbicides. The product labels for the 2018 to 2020 growing seasons stipulated a 110-foot downwind application buffer where dicamba cannot be applied in the field. These distances were increased if endangered species were present. Therefore, growers need alternative herbicide management programs that utilize non-dicamba postemergence herbicides which can effectively control weeds at similar levels as the dicamba based programs. Therefore, studies were initiated to evaluate alternative non-dicamba herbicide programs for weed management in downwind buffer areas in dicamba tolerant cotton. Field experiments were conducted at the Clemson University Edisto Research and Education Center (EREC) located near Blackville, SC. Cotton variety Deltapine 1851 B3XF was seeded in mid-May of 2019 and 2020 at 3 seeds per of row foot. Herbicide treatments were Reflex at 12 fl oz/A + diuron at 16 fl oz/A or Reflex at 12 fl oz/A + Brake at 16 fl oz/A preemergence (PRE); Liberty at 32 fl oz/A + Staple at 2 fl oz/A or Liberty + Glyphosate at 32 fl oz/A + Warrant at 48 fl oz/A or Liberty + Warrant postemergence 1 (POST1); and Liberty + Glyphosate + Dual Magnum at 16 fl oz/A or Liberty + Glyphosate + Warrant or Liberty + Glyphosate postemergence 2 (POST2). Treatments were applied in 2019 on at planting (PRE), June 24 (POST1 [PT1]), and July 11 (POST2 [PT2]). In 2020, treatments were applied on at-planting (PRE), June 17 (PT1), and July 6 (PT2). Percent cotton injury and weed control were collected at the PT1, PT2, and 2 weeks after PT2 (2WPT2). After defoliation, cotton yields were collected using a John Deere 9986 spindle picker equipped with a weighing system. Percent weed control and seed cotton yield were analyzed using ANOVA and means separated at the P = 0.05 level. In 2019, Palmer amaranth control ranged from 98 to 100% across all timings. Similarly, pitted morningglory and broadleaf signalgrass control ranged from 97 to 100%. By the 2WPT2 timing, all treatments provided excellent control of all the target weeds observed in this study. In 2020, Palmer amaranth control ranged from 94 to 100% across all timings. Pitted morningglory and broadleaf signalgrass control also ranged from 95 to 100%. The overall results were like 2019 in which all treatments at the 2WPT2 timing provided excellent control of all the target weeds observed in this study. Overall, the only significant differences noted were between the two PRE programs (Diuron + Reflex vs Reflex + Brake). Reflex + Brake PRE provided more consistent weed control at the PT1 evaluation timing. Palmer amaranth, pitted morningglory, and broadleaf signalgrass control were excellent across the treatments at 2WPT. In 2019, no differences were observed in seed cotton yields across the treatments; however, in 2020, cotton yields were significantly lower in two treatments compared to the rest of the treatments. No apparent reason for this decrease was observed in season.