LONG-TERM RESIDUAL EFFICACY OF FLURIDONE IN SOUTHEAST COTTON

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Abstract

The predominance and spread of herbicide resistant Palmer amaranth biotypes across the southeastern United States has growers searching for new herbicide alternatives. Fluridone herbicide is currently marketed in the aquatic market under the trade name Sonar. In the late 1970's, fluridone was tested under the trade name Brake and found to be safe on cotton due to differential translocation, but not marketed due to cost concerns. Recently, interest in bringing fluridone into the cotton market was brought forward by SePro Corporation. However, information on fluridone efficacy on Palmer amaranth (which was a not common weed during the late 1970's) control was lacking. Therefore, field studies were initiated and conducted across the southeast to determine the efficacy and long-term residual potential of fluridone for Palmer amaranth control and cotton yield. Field experiments were conducted at the Clemson University Edisto Research and Education Center (EREC) located near Blackville, SC; a grower field located near Mt. Olive, NC, and at the Sunbelt Expo located near Moultrie, GA in 2012. Experimental design consisted of a randomized complete block design with 4 replications with individual plot sizes of 12.7 by 40 ft, 6 by 25 ft, and 12.7 by 25 ft at EREC, Sunbelt Expo, and Mt. Olive, respectively. Phytogen Widestrike 499 cotton was planted on May 7, 2012 at Mt. Olive and May 21, 2012 at EREC. FiberMAX 1944GLB2 cotton was planted on May 2, 2012 at Sunbelt Expo location. Preemergence (PRE) herbicides were applied in water on May 22, 2012, May 3, 2012, and May 8, 2012 at EREC, Mt. Olive, and Sunbelt Expo sites, respectively, at a carrier volume 15 gallons per acre. Palmer amaranth percent visual control ratings were collected 2, 4, and 8 weeks after PRE application treatment (WAT) on a 0 to 100 percent scales with 0 indicated no control and 100 equal to complete control. Seed cotton yields were collected at the EREC and Sunbelt Expo locations on December 4, 2012 and October 18, 2012, respectively. Palmer amaranth control data and seed cotton yields were analyzed using ANOVA and means separated at the P = 0.05 level. Preemergence treatments included fluridone at 0.125, 0.25, 0.375, and 0.5 lb ai/A, prometryn at 1.0 lb ai/A, diuron at 1.0 lb ai/A, fomesafen at 0.25 lb ai/A, fomesafen plus diuron at 0.25 plus 0.5 lb ai/A, and untreated control. Fluridone provided 91% or greater control of Palmer amaranth at 8 WAT at the EREC location, which was similar to fomesafen and fomesafen + diuron treatments. At the Sunbelt Expo location, all PRE treatments provided 94% or better Palmer amaranth control at 8 WAT. Fluridone at 0.375 and 0.5 lb ai/A provided 95% Palmer amaranth control at 4 WAT; however, control declined to less than 73% at 8 WAT at the Mt. Olive location. At the Mt. Olive and EREC locations, prometryn and diuron alone residual activity on Palmer amaranth declined rapidly at 8 WAT compared to the fluridone and fomesafen + diuron treatments. Fluridone provided 83% or greater Palmer amaranth control at 2 WAT at Mt. Olive; however, control declined rapidly afterward which may have been attributed to Palmer amaranth germinating and emerging before fluridone was activated. At the Sunbelt Expo locations, seed cotton yields were similar among all preemergence treatments except for the untreated control. Seed cotton yields at EREC were lower compared to the Sunbelt Expo location. Cotton yields were lower in prometryn and diuron treatments compared to the fluridone treatments, fomesafen, and fomesafen + diuron. Fluridone (all rates), fomesafen, and fomesafen + diuron provided good to excellent control of Palmer amaranth at 2 of the 3 locations in 2012. Based on the precipitation data, all PRE treatments received adequate activating rainfall shortly after application. Cotton visual injury symptoms were 11% or less across all locations. Seed cotton yields were not adversely affected by fluridone, fomesafen, or diuron treatments.