

IGNITE-BASED HERBICIDE PROGRAMS FOR GLYPHOSATE-RESISTANT PALMER AMARANTH IN SOUTH CAROLINA COTTON

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Abstract

Palmer amaranth, characterized by its rapid growth, high reproductive capabilities, and tolerance to drought, is a major weed in cotton fields in Southern US. The efficiency of traditional control options of this weed have declined due to development of resistance to glyphosate- and ALS-herbicides. The objectives of our studies were to optimize various preemergence and postemergence herbicide programs for the management of glyphosate-resistant Palmer amaranth. In addition, the length of residual Palmer amaranth control provided by various soil applied herbicides was characterized. PhytoGen Widestrike 375RR Flex cotton was seeded at 2 different locations- Clemson University Edisto Research and Education Center (EREC) located near Blackville, SC, and at Pee Dee Research and Education Center (PDREC) located near Florence, SC. Experimental design consisted of a randomized complete block with individual plot sizes of 12.7 by 40 ft. Each plot was replicated four times. Preemergence (PRE) herbicides were applied at time of planting and postemergence (EPOST) herbicides were applied three weeks after planting at a carrier volume of 15 GPA. Preemergence treatments include Staple (2.1 oz/A), Prowl H2O (2.0 pt/A), Reflex (1.0 pt/A), Direx (1.0 pt/A), Cotoran (1.0 qt/A). Postemergence treatments include Dual Magnum (1.0 pt/A), Roundup PowerMAX (22 oz/A), Ignite (29 oz/A), Staple (2.5 oz/A). Palmer amaranth visual control ratings were collected 14 and 28 days after treatment (DAT) on a 0 to 100% scale with 0 indicating no control and 100% equal to complete control. Cotton injury ratings and weed control data were analyzed using ANOVA and means separated at the $P = 0.05$ level. Preemergence control of Palmer amaranth declined across all treatments over time, particularly at PDREC where soil seedbank populations were higher. The highest level of control of Palmer amaranth at both locations was obtained by Reflex PRE plus combination(s) of Staple, Direx, or Prowl H2O PRE. Direx PRE provided similar levels of control as Reflex PRE when tank mixed with Prowl and Staple PRE. Direx PRE could serve as a rotational herbicide with Reflex PRE. Staple EPOST provided excellent control of Palmer amaranth. In this study, few differences were observed in Palmer amaranth control achieved in each preemergence program. Most treatments provided 95% control through the first rating and 90% control through the second rating. These studies emphasized the importance of a foundation preemergence herbicide in a grower's herbicide program. All treatments had little or no negative impact on the cotton yield. This data underscores the importance of preemergence followed by postemergence plus soil residual herbicide program in managing herbicide resistant Palmer amaranth.