

**COMBINATIONS OF AT-PLANT BRAKE AND REFLEX FOR WEED CONTROL IN COTTON**

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**Abstract**

Palmer amaranth is the most common and troublesome weed in the Southern region of the United States. The spread of herbicide resistant Palmer amaranth biotypes has growers searching for new herbicide alternatives. Recent studies have shown Brake (fluridone) herbicide is highly efficacious on Palmer amaranth and other important weed species in cotton. At low rates (0.15 lb ai/A), Brake alone can provide up to 8 weeks of residual activity. However, Brake alone requires significant rainfall (~0.5 in) following application for activation in the soil profile. Therefore, the objectives were to examine combinations of Brake with reduced rates of Reflex (fomesafen), herbicide that requires very little moisture for soil activation, on weed control and cotton yield response. Field studies were conducted at Edisto Research and Education Center near Blackville, SC in 2013. Experimental design consisted of a randomized complete block with 4 replications with individual plot sizes of 12.7 by 40 ft. PhytoGen Widestrike 499 cotton was seeded at 3.8 seeds/ft on May 22, 2013. Preemergence (PRE) herbicides were applied in water on May 22, 2013, followed by POST1 at 2-4 lf and POST2 at 6-7 lf cotton at a carrier volume of 15 GPA. At-plant preemergence (PRE) treatments were fluridone at 0.15, 0.20, 0.25, and 0.30 lb ai/A in combination with Reflex at 0.125 lb ai/A. Each PRE was followed with two postemergence (POST) applications of Liberty (glufosinate) at 0.53 lb ai/A alone or Liberty at 0.53 lb ai/A + Warrant (acetochlor) at 1.125 lb ai/A. Percent Palmer amaranth visual control ratings were collected 3, 5, and 9 weeks after PRE application treatment (WAT) on a 0 to 100% scale with 0 indicating no control and 100% equal to complete control. Seed cotton yields were collected on December 20 2013. Palmer amaranth control data and seed cotton yields were analyzed using ANOVA and means separated at the  $P = 0.05$  level. The half rate of Reflex 0.125 lb ai/A (8 oz/A) provided excellent short-term Palmer amaranth control (100%) with very little seedling cotton injury observed across all treatments until adequate rainfall occurred for Brake activation. All treatments provided 100% or greater control of Palmer amaranth and goosegrass at 9 WAT. At the low rates of Brake (0.15 and 0.20 lb ai/A), pitted morningglory control was 85-90% control at 3 WAT. After two POST applications of Liberty plus Warrant, control increased to 95-100% control at 5 and 9 WAT. At the end of the season, Palmer amaranth and goosegrass control was excellent (nearly 100%) across all treatments. Pitted morningglory control did decline later in the season due to season long emergence. Despite record precipitation received at the station in 2013, Brake remained active in the soil profile on most weed species in the study throughout the growing season. In-season cotton injury across all herbicide treatments was less than 5%. Similarly, no differences were observed between cotton yields among the selected herbicide treatments. Overall, Brake + Reflex provided good to excellent control of Palmer amaranth, pitted morningglory, and goosegrass in 2012. In conclusion, the low rate of Reflex provided excellent control of Palmer amaranth and other weed species until adequate rainfall activated the Brake tank mix partner. Cotton visual injury symptoms were minor across all of the treatments and end of season cotton yields were not adversely affected by the Brake plus Reflex PRE, regardless of Brake rate, followed by Liberty alone or Liberty plus Warrant POST treatments.