HERBICIDE PROGRAMS FOR PALMER AMARANTH AND PITTED MORNINGGLORY CONTROL IN DICAMBA-TOLERANT COTTON Michael W. Marshall Clemson University Blackville, SC

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<u>Abstract</u>

Glyphosate- and ALS-resistant Palmer amaranth biotypes continue to spread throughout the coastal plain of South Carolina. Currently, Palmer amaranth biotypes resistant to glyphosate, ALS-inhibitors, or both have been confirmed in 20 counties. New technologies are needed to manage this pest. Herbicide tolerant crop technology provides the ability to apply herbicides over-the-top that would otherwise severely injure the crop. In the near future, dicamba tolerant crop technology will provide over-the-top crop tolerance to applications of dicamba. Therefore, research studies were initiated to ascertain effectiveness of dicamba-based herbicide programs for control of Palmer amaranth and other important broadleaf weeds and crop response of dicamba tolerant cotton. Field experiments were conducted at the Clemson University Edisto Research and Education Center located near Blackville, SC in 2011. Experimental design consisted of a randomized complete block design with 4 replications with individual plot sizes of 12.7 by 40 ft. The middle two rows were treated leaving the outside two rows of the plots as untreated running checks. Dicamba-tolerant cotton was planted on May 24, 2011 using a 4-row Almaco cone planter with a final seed spacing of 3 seed per row ft. Reflex (fomesafen) at 1.0 pt/A, Clarity (dicamba) at 1.0 pt/A were applied preemergence (PRE) shortly after planting alone and in combinations in water at a carrier volume of 15 GPA with a pressure of 34 PSI. Approximately 14 (early-post) and 33 (late-post) days after planting, various combinations of Clarity at 1.0 pt/A, Glyphosate at 22 oz/A, Ignite (glufosinate) at 29 oz/A, and Warrant (acetochlor) at 3.0 pt/A were applied postemergence (POST) [corresponds to 3 to 4 inch weed size at each application timing] with the same application parameters discussed above. Palmer amaranth and pitted morningglory percent visual control and percent visual cotton injury were measured 19 days after early-post (EP) and 35 days after the late-post (LP) applications. Cotton injury and weed control data were analyzed using ANOVA and means separated at the P=0.05 level. Reflex, Clarity, and Clarity + Reflex PRE provided excellent control of Palmer amaranth. Similarly, Glyphosate + Clarity, Ignite + Warrant, Glyphosate + Clarity + Warrant, and Ignite + Clarity EP provided 93 to 100% control of Palmer amaranth and pitted morningglory, regardless of the PRE program. In the no PRE treatments, Glyphosate + Clarity + Warrant EP provided 94% Palmer amaranth control compared to greater than 98% with Glyphosate + Clarity, Ignite + Warrant, and Ignite + Clarity EP. Pitted morningglory control was greater than 94% in the no PRE across all treatments. At the 35 days after LP application evaluation, all treatments provided 100% control of Palmer amaranth and pitted morningglory. In conclusion, Dicamba and Ignite-based PRE and EP herbicide programs provided good to excellent control of small Palmer amaranth and pitted morningglory. No significant cotton vield or in-season injury differences were observed. Dicamba and Ignite-based herbicide programs alone and in combination provided an effective alternative for small (3 to 5 inch) glyphosate- and ALSresistant Palmer amaranth and other important broadleaf weeds in cotton. Future work includes testing Dicamba and Ignite-combinations on larger Palmer amaranth and other broadleaf weeds including sicklepod and small-flower morningglory