WEED MANAGEMENT IN DICAMBA/GLUFOSINATE-TOLERANT COTTON IN THE TEXAS HIGH PLAINS J.L. Spradley J.W. Keeling P.A. Dotray J.D. Reed Texas AgriLife Research Lubbock, TX

<u>Abstract</u>

The development of transgenic dicamba/glufosinate-ammonium tolerant (DGT) cotton combined with glyphosate tolerance will allow new active ingredients to help improve control of many problem annual and perennial weeds compared to glyphosate alone. Weed species including horseweed, Russian thistle, kochia, morningglory, field bindweed, woollyleaf bursage, and Texas blueweed are not always effectively controlled with glyphosate alone, but dicamba and glufosinate may improve control. Management of newly emerging glyphosate-resistant Palmer amaranth populations should also improve if DGT cotton is available.

The objectives of this study were 1) to evaluate dicamba applied preemergence (PRE) and postemergence (POST) alone or in combination with glufosinate or glyphosate for Palmer amaranth control in DGT cotton; 2) to compare Palmer amaranth control with dicamba-based treatments in DGT cotton to conventional weed management programs; and 3) determine cotton response and lint yields to dicamba and glufosinate applications in DGT cotton.

In field trials conducted near Lubbock, TX in 2010 and 2011, dicamba (Clarity) was applied PRE, early postemergence (EPOST) alone or in combination with glufosinate (Ignite) or glyphosate (Roundup PowerMax [RUPM]). These treatments were followed by (fb) Ignite, Ignite+Clarity, or RUPM as sequential midpostemergence (MPOST) applications. All plots received a layby application of Direx+MSMA. Treatments were made using a CO_2 -pressurized backpack sprayer calibrated to deliver 10 gallons per acre. A DGT cotton variety was planted on May 12 in 2010 and May 23 in 2011 on 40-inch rows. Plots 4 rows by 30 feet in length were replicated three times. Weed control was visually estimated based on a standard scale of 0 to 100%, where 0 = no weed control and 100 = complete weed control, and verified with weed counts.

In 2010, Clarity PRE controlled Palmer amaranth for 21 to 28 days after planting. Following Clarity PRE, Clarity or Ignite+Clarity EPOST controlled Palmer amaranth >90%. Without Clarity PRE, Palmer amaranth control ranged from 68 to 74% with these treatments. Ignite, Clarity, or Ignite+Clarity applied at delayed EPOST timings controlled Palmer amaranth 93 to 100% following Clarity PRE. When Ignite was applied as a sequential MPOST treatment, Clarity or Ignite+Clarity controlled Palmer amaranth 95 to 96% following Clarity PRE and 83 to 84% without Clarity PRE. Treatments that controlled Palmer amaranth >90% season-long included Clarity or Ignite+Clarity. When Clarity was applied PRE, control was similar when treatments were applied either EPOST or delayed EPOST. Sequential RUPM applications provided similar control.

In 2011, due to lack of activating rainfall, little to no activity was observed with Clarity PRE. RUPM, Ignite+Clarity or RUPM+Clarity applied EPOST controlled Palmer amaranth 92 to 96%. Ignite+Clarity or RUPM+Clarity controlled Palmer amaranth >90% when application was made at the delayed-EPOST timing. Ignite controlled Palmer amaranth <50% applied EPOST and 30% when applied delayed-EPOST. Ignite+Clarity, RUPM+Clarity, or RUPM controlled Palmer amaranth >90% when applied as a sequential MPOST. Treatments that controlled Palmer amaranth >90% season-long included RUPM+Clarity, Ignite+Clarity and RUPM when a Direx+MSMA layby treatment was used. In either year, no injury from any herbicide treatment was observed. These results indicate that dicamba and glufosinate can be safely used in DGT cotton.