BOLLGARD II[®] XTENDFLEXTM COTTON WEED MANAGEMENT SYSTEMS IN THE TEXAS HIGH PLAINS P.A. Dotray

Texas Tech University, Texas A&M AgriLife Extension Service, and Texas A&M AgriLife Research

Lubbock, TX J.W. Keeling T.S. Morris Texas A&M AgriLife Research Lubbock, TX M.R. Manuchehri R.M. Merchant Texas Tech University Lubbock, TX J.D. Everitt Monsanto Shallowater, Texas

<u>Abstract</u>

Glyphosate-resistant Palmer amaranth (Amaranthus palmeri S. Wats.) was identified in Terry County, Texas in 2011 and the number of fields containing resistant populations continues to increase each growing season. Increasing awareness for the recognition of resistant weed populations and the importance of weed removal prior to seed maturation is an important principle for resistance management. The use of soil residual herbicides preplant, atplant, and early- and mid-postemergence is essential for resistance management, preferably at more than one application timing to achieve overlapping residuals with alternative modes of action. There are a number of herbicides currently registered for use in cotton that may be used to help manage Palmer amaranth populations. New cotton germplasm technologies that will allow alternative herbicide "modes of action" are on the horizon. One such technology is Bollgard II[®] XtendFlexTM Cotton, which pending regulatory approval is anticipated to be available to growers as early as 2015. This technology will be a three-way herbicide tolerance stack to dicamba, glyphosate, and glufosinate when applied preplant, at-plant, preemergence, and postemergence. The proposed dicamba application window will be full season. This technology will improve control of Palmer amaranth and other troublesome annual and perennial weeds. The objective of this research was to examine weed management "systems" in Bollgard II[®] XtendFlexTM Cotton utilizing soil residual herbicides. Weed management treatments included systems with and without Trifluralin (1.5 pints) preplant incorporated; Warrant (3 pints), Warrant plus MON 119096 (an experimental low-volatility formulation of dicamba at 22 ounces), or no herbicide applied preemergence (PRE); and Liberty (2 pints), Liberty plus MON 119096, MON 76832 (an experimental low-volatility premix formulation of dicamba plus glyphosate (62 ounces), Roundup PowerMax (32 ounces), or Roundup PowerMax plus Warrant applied early-postemergence (EPOST), mid-postemergence (MPOST), and/or latepostemergence (LPOST). Trials were conducted at the Texas Tech Research facility near New Deal (subsurface drip irrigation) and at the Texas A&M AgriLife Research farm at Lubbock (limited furrow irrigation capabilities). Plots at New Deal were 4 rows by 30 feet and contained a dense and light population of Texas millet (Urochloa texana Buckl.) and glyphosate-susceptible Palmer amaranth, respectively. The soil type was a Pullman clay loam. Similar plot sizes were used at Lubbock in soils that contained dense populations of Palmer amaranth and devil'sclaw (Proboscidea louisianica P. Mill.). The soil type at Lubbock was an Acuff loam. At the New Deal location, late-season control of Texas millet and Palmer amaranth was at least 99% following Trifluralin followed by (fb) Warrant PRE fb MON 76832 MPOST fb Roundup PowerMax LPOST, and Trifluralin fb MON 76832 MPOST fb Roundup PowerMax plus Warrant LPOST. Texas Millet and Palmer amaranth were controlled at least 97% following Trifluralin fb Liberty plus MON 119096 MPOST and LPOST. At the Lubbock location, late-season control of Palmer amaranth and devil's-claw was at least 99% following Warrant plus MON 119096 PRE fb MON 76832 EPOST, Warrant PRE fb MON 76832 EPOST and LPOST, and Trifluralin fb Warrant PRE fb MON 76832 MPOST fb Roundup PowerMax LPOST. Palmer amaranth and devil's-claw were controlled at least 96% following Trifluralin fb Liberty plus MON 119096 MPOST and LPOST. Data from these trials suggest that several effective weed management systems were identified in Bollgard II[®] XtendFlexTM cotton in different irrigation environments. Soil residual herbicides at-plant and/or preemergence will be essential "foundations" for sustainable control of Palmer amaranth, Texas millet, and devil's-claw, which will reduce weed emergence and crop competition with less reliance on postemergence herbicides.