GLYPHOSATE-RESISTANT PALMER AMARANTH (*AMARANTHUS PALMERI*) CONTROL IN COTTON (*GOSSYPIUM HIRSUTUM*) WITH THE ENLIST™ WEED CONTROL SYSTEM

R. J. Edwards
D. B. Reynolds
D.M. Dodds
Mississippi State University
Starkville, MS
J. A. Bond
Mississippi State University
Stoneville, MS
Larry Walton
Dow AgroSciences
Indianapolis, IN

Abstract

Dow AgroSciences is developing Enlist Duo™, a new herbicide product featuring Colex-D™ Technology combining a new 2,4-D choline product, the latest formulation science and a proprietary manufacturing process developed to deliver ultra-low volatility, minimized potential for physical drift and lower odor. Therefore, a study was performed across the state of Mississippi in 2012 to assess the use of Enlist Duo herbicide (GF-2726) for control of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in Enlist cotton (*Gossypium hirsutum*). Enlist Duo 3.33 SL is a premix of glyphosate (1.71 lb ae/gal) and 2,4-D choline (1.62 lb ae/gal). Studies were conducted at three sites; Batesville, Dundee, and Stoneville, MS. All sites were chosen based upon heavy infestations of previously detected glyphosate-resistant Palmer amaranth. Each study consisted of 16 treatments (15 herbicide applications and an untreated check).

Herbicides were applied at three different timings; preemergence (PRE), early postemergence (EPOST) to 2 to 4 inch Palmer amaranth, and (LPOST) which was 14 to 21 days after the EPOST application. With the exception of the untreated check all treatments received a PRE application of Cotoran 4L (fluometuron) at 32 fl oz/A. The EPOST treatments consisted of sequential applications of Enlist Duo applied alone at 56 and 75 fl oz/A. Additional EPOST treatments included Enlist Duo + Liberty 2.34 SL (glufosinate) at 75 + 29 fl oz, Enlist Duo + Dual II Magnum 7.62 EC (S-metolachlor) at 75 + 16.2 fl oz, Enlist Duo + Warrant 3 SC (acetochlor) at 75 + 48 fl oz, Enlist Duo + StapleLX 3.2 SL (pyrithiobac) at 75 + 3 fl oz, 2,4-D choline salt 3.8 SL + Liberty at 32 + 29 fl oz, Roundup WeatherMax 4.5 SL (glyphosate) at 28.4 fl oz, Liberty at 29 fl oz, and Liberty + Warrant at 29 + 48 oz. The EPOST treatments were followed by LPOST applications of Liberty at 29 fl oz, Enlist Duo + Liberty at 75 + 29 fl oz, 2,4-D choline salt + Liberty at 32 + 29 fl oz, or Roundup WeatherMax at 28.4 floz.

Visual estimates of Palmer amaranth control were taken 7, 14 and 21 days after treatment (DAT) for each application. Data for the 14 DAT following the last application were averaged across sites and subjected to an analysis of variance, with means separated using LSD (α=0.05) to test for differences in Palmer amaranth control. There were no significant differences among treatments containing Enlist Duo with all applications averaging greater than 90% control. Significant differences were only detected between singular applications of Roundup Weathermax applied at both timings (62% control) and a PRE application of Cotoran (33% control) between all other applications.

With individual plants producing approximately 600,000 seeds during a growing season, complete control of Palmer amaranth is desirable. Enlist Duo may be used as a component of a comprehensive weed management program to control Palmer amaranth while also utilizing an additional mode of action to manage the development of resistance.