SEQUENTIAL APPLCIATIONS OF LIBERTY® AND ENLIST® OR XTENDIMAX®

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Abstract

Dicamba and 2,4-D tolerant cotton systems that utilize XtendiMax and Enlist One or Enlist Duo, respectively, were introduced in 2016 and provide new opportunities to manage glyphosate-resistant populations of Palmer amaranth (*Amaranthus palmeri*). Adding Liberty into these auxin-based systems may not only improve management of glyphosate-resistant and other troublesome weeds, but also protect against rapid development of herbicide resistance to Group 4 modes of action. Two trials were conducted near Lubbock, Texas in 2018 and 2019 to assess the importance of Liberty in Enlist and XtendiMax herbicide systems. The trials were conducted in a non-crop environment and locations had a dense population of Palmer amaranth. One trial consisted of sequential applications of Liberty® 280 SL and XtendiMax® with VaporGrip Technology®. Palmer amaranth at the initial application was <4-inches, 4- to-8-inches, and >12-inches in size. Another trial consisted of sequential applications of Liberty and Enlist One® with Colex-D® technology or Enlist Duo® with Colex-D® technology. Palmer amaranth at the initial application in these trials were 3- to 6-inches and 10- to 12-inches in size. Applications were made using a CO_2-pressurized backpack sprayer at a volume of 15 gallons per acre. XtendiMax and Enlist treatments were sprayed with Turbo TeeJet Induction 11002 nozzles while all Liberty treatments were sprayed with Turbo TeeJet 11002 nozzles and ammonium sulfate at 2.6 lb. per acre was added to the tank. Treatments were applied at the following rates: XtendiMax 0.5 lb. ae/A, Enlist One 0.7 lb. ae/A, Enlist Duo 1.4 lb. ae/A, and Liberty 0.8 lb. ai/A for all initial applications and those that followed an auxin application, or 0.5 lb. ai/A following an initial application of Liberty. The sequential application followed the initial application by 10 or 11 days. When evaluated 21 days after sequential application, all treatments in the XtendiMax trial controlled <4-inch Palmer amaranth at least 86%. Liberty followed by (fb) XtendiMax controlled all sizes of Palmer amaranth as good or better than XtendiMax fb XtendiMax. Palmer amaranth was controlled at least 89% 11 days after sequential applications of Enlist Duo fb Enlist Duo or Liberty. Two applications of Liberty or treatments with Enlist One in the initial application were less effective at controlling Palmer amaranth when compared to Enlist Duo fb Enlist Duo or Liberty. In each trial, replacing an application of an auxin herbicide with Liberty resulted in similar weed control when compared to two applications of the auxin herbicide. The use of Liberty adds an alternative mode of action in an auxin-based system and should help sustain these new auxin-technologies from rapid development of herbicide resistance.