AUXIN TECHNOLOGY IN TEXAS HIGH PLAINS COTTON

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Abstract

Enlist™ and XtendFlex® cotton technology, utilizing auxin + glyphosate (Enlist Duo™) and glufosinate tolerance, has the potential to effectively manage Palmer amaranth (*Amaranthus palmeri* S. Wats.), Russian-thistle (*Salsola tragus* L.), and other difficult-to-control weeds in Texas High Plains cotton. Weed management systems and tank contamination trials were conducted near Lubbock, TX in 2013, 2014, and 2015 in order to best understand how to best use auxin tolerant cotton systems. In weed management systems trials, the effectiveness of auxins alone and in combination with glufosinate and several soil-residual herbicides for post emergence control of Palmer amaranth were evaluated. Systems trials consisted of a preplant incorporated (PPI) or preemergence (PRE) application followed by (fb) an early post emergence (EPOST) application fb a mid-post emergence (MPOST) application. In the 2013 Enlist™ systems trial evaluated 28 days after the MPOST application, Palmer amaranth was controlled approximately 97% in all herbicide systems with the exception of systems that included a MPOST application of glufosinate alone. Combined across 2014 and 2015, Palmer amaranth control was similar across herbicide systems (approximately 98%) with the exception of trifluralin PPI fb glufosinate (with or without acetochlor) EPOST fb glufosinate MPOST. In the 2013 XtendFlex® systems trial evaluated 21 days after the MPOST application, Palmer amaranth was controlled at least 95% with the exception of acetochlor/glufosinate and acetochlor/glyphosate only systems. Control never reached above 90 and 80% following applications made to 10 to 15 and 20 to 30 cm Palmer amaranth, respectively. In 2014, Palmer amaranth was controlled at least 90% with the exception of glufosinate EPOST fb glufosinate MPOST. In 2015, Palmer amaranth was controlled at least 93% following all treatments. In the 2013 tank contamination study, 21 and 81% yield loss occurred for 9 leaf cotton when concentrations of 0.8 and 8% of Enlist Duo™ were present in spray solution while 80% yield loss occurred for first bloom cotton at a contamination level of 8%. In the 2014 study, 45 and 94% yield loss occurred for 9 leaf cotton when concentrations of 0.8 and 8% of Enlist Duo™ were present in spray solution while 78% yield loss occurred for first bloom cotton at a contamination level of 8%. In 2015, 42, 72, and 91% yield loss occurred for contamination levels of 0.08, 0.8, and 8%, respectively at the 9 leaf stage while 24 and 65% yield loss occurred for contamination levels of 0.8 and 8%, respectively at the first bloom stage. Overall, several effective treatments were identified; however, the most sustainable treatments were a result of a systems approach that involved multiple application timings, multiple herbicide modes of action, and the addition of soil residual herbicides. Tank contamination trials further support the statement that the relationship between visual injury and yield loss is complicated and poorly understood.