WEED MANAGEMENT AND ECONOMICS IN BOLLGARD II XTENDFLEX COTTON SYSTEMS

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Abstract

Managing glyphosate-resistant Palmer amaranth *(Amaranthus palmeri)* has increased weed management costs for Texas High Plains cotton producers. The introduction of Bollgard II XtendFlex (dicamba-tolerant) varieties and registration of dicamba formulations for postemergence use in cotton, combined with residual herbicides, can effectively control Palmer amaranth. It is estimated that 60-70% of the region's cotton acreage was planted in Bollgard II XtendFlex varieties in 2018. To maintain this technology, proper use of residual herbicides is essential. A field study was conducted in 2018 at Lubbock to evaluate Palmer amaranth control and weed management cost for XtendFlex, LibertyLink, Roundup Ready, and conventional cotton systems for irrigated and dryland production. Trifluralin was used as a preplant incorporated (PPI) treatment in all cotton production systems. Caparol was applied preemergence (PRE) in all systems except for the XtendFlex with XtendiMax applied PRE only. The XtendFlex system included a tank mix of XtendiMax + Roundup PowerMax applied early postemergence (EPOST) and XtendiMax + Roundup PowerMax + Warrant applied mid postemergence (MPOST). LibertyLink systems included Liberty EPOST and Liberty + Warrant MPOST. Roundup Ready systems included Roundup PowerMax EPOST and Roundup PowerMax + Warrant MPOST, and used hand hoeing and tillage to control glyphosate-resistant Palmer amaranth. The conventional system utilized tillage and hand hoeing for in-season weed control and Warrant MPOST. The XtendFlex (XtendiMax PRE only) system included Roundup PowerMax EPOST and Roundup PowerMax + Warrant MPOST, and utilized tillage and hand hoeing to control glyphosate-resistant Palmer amaranth. Applications were made using a CO_2-pressurized backpack sprayer at a volume of 15 gallons per acre. Dicamba treatments were sprayed with Turbo TeeJet Induction 11002 nozzles and non-dicamba treatments were applied with Turbo TeeJet 11002 nozzles. Consistent season-long Palmer amaranth control was achieved with the XtendFlex system in both irrigated and dryland production with 99-100% control. In irrigated production, greatest lint yields were achieved with XtendFlex and Roundup Ready systems. All systems produced similar yields in dryland cotton production. Total weed management costs were similar across all systems, with greater seed/technology and herbicide costs in XtendFlex systems, compared to higher tillage and hand hoeing costs in Roundup Ready, conventional, and XtendFlex PRE systems. Greatest gross revenues above weed management costs were achieved with the XtendFlex system in irrigated production. Gross revenue above weed management costs were similar across dryland production systems.