SPATIAL MOVEMENT OF GLYPHOSATE-RESISTANT PALMER AMARANTH IN ROUNDUP READY FLEX® COTTON

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Abstract

There are now five confirmed glyphosate-resistant (GR) weed species in Arkansas. Of particular concern to producers is how fast GR populations spread. The objective of this research was to determine the extent of GR Palmer amaranth (PA) patch expansion in a Roundup Ready Flex® cotton production system. Glyphosate-resistant PA was sown at 20,000 seeds into a single circular 1-m^2 area in four 0.6- to 1.2-ha fields in February 2008, representing seed production from a single GR plant that survived to maturity in 2007. Glyphosate was applied as needed to control all other species in the field. In 2008 and 2009, the final density of PA was taken using a 1.0-m^2 grid. Spatial seed cotton yields were taken using a yield monitor and GPS receiver. In 2008, over 28 cm of rain fell in the month of March alone, and it is believed this rainfall was responsible for longitudinal movement as far as 114 m downslope. Longitudinal movement was greater in 2009, likely a result of cotton harvest, stalk destruction, tillage, and increased seed production from 2008 survivors. In 2008, PA patches increased in size from the initial 1-m^2 to a total infested area in each field of 26 to 36 m^2. In 2009, GR PA had expanded to the borders of all four fields. Longitudinal spread was as far as 237 m in 2009, while lateral movement occurred up to 30 m from the source.