## TILLAGE INFLUENCES PALMER AMARANTH CONTROL BY REFLEX

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## <u>Abstract</u>

In dry land cotton production, the use of tillage has become an ever increasing tool for the control of glyphosateresistant Palmer amaranth. Although residual herbicides can control Palmer amaranth, they are only effective when sufficient rainfall/irrigation occurs shortly after application to ensure activation. The objective of this study was to determine the influence of various tillage implements on the activity of Reflex under three environments, including 1) moist soil at planting followed by a timely rainfall/irrigation, 2) moist soil at planting but no timely activating rainfall/irrigation, and 3) a soil without any moisture or timely rainfall/irrigation.

Experiment one included Reflex (16 oz/A) plus Prowl  $H_20$  (16 oz/A) or no herbicide applied 1) PRE, 2) incorporated with a roto-tiller 2- to 3-inches deep, 3) incorporated with a field cultivar 2- to 3-inches deep, 4) incorporated with a disk 4- to 6-inches deep, and 5) incorporated with a strip till unit having a ripper shank and rolling baskets. Cotton, PHY 375 WRF, was planted into a moist soil and 0.5 inch of irrigation was implemented 5 days after planting (DAP) to activate herbicides and to also increase the potential for cotton injury from herbicides being splashed from the soil onto the cotton as it was emerging. At 14 DAP, Palmer amaranth control was 99% with a PRE application; control was similar with the roto-till incorporation (95%) but less with the field cultivator (89%), disk (71%), and strip-till unit (85%). By 38 DAP, control was greatest with the PRE application (99%) followed by roto-till incorporation (91%), field cultivator (80%), strip-till (75%) and disk (3%). Cotton injury from splashing was at most 20% with the PRE application while injury from all incorporated applications was 9% or less throughout the season.

Experiment two included Reflex (16 oz/A) applied PRE or roto-tilled into a moist soil where PHY 375 WRF cotton was planted. Although the soil contained moisture at planting, the first activating rainfall for the PRE application was 12 DAP. The roto-tilled incorporation of Reflex controlled Palmer amaranth 95 and 93% at 14 and 28 DAP, respectively, and control was 8 and 14% greater than the PRE application. No cotton injury was observed with either treatment.

Experiment three included Reflex (16 oz/A) applied PRE or roto-tilled into an extremely dry soil. The first activating rainfall occurred 7 day after treatment. The soil was so dry that Palmer amaranth did not emerge until after the rainfall, 12 day after treatment. Palmer control at 14 and 35 day after treatment was at least 92% and similar with the PRE and roto-tilled incorporated application.

Reflex applied PRE is the most effective option for the control of Palmer amaranth as long as the herbicide is activated by rainfall or irrigation. In dryland production when rainfall is not timely, a shallow incorporation of Reflex is more effective than a PRE application if the soil contains enough moisture for activation when incorporated. Cotton injury can be reduced through incorporation of Reflex as it reduces the injury from splash if the first rainfall/irrigation occurs during cotton emergence.