

Public Abstract

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Title:WEED MANAGEMENT AND NITROGEN LOSS IN GLYPHOSATE-RESISTANT CORN (ZEA MAYS)

The advent of glyphosate-resistant corn in Missouri has changed traditional reemergence (PRE) followed by postemergence (POST) herbicide programs to ones that predominately utilize glyphosate POST. POST only programs can allow early season weed competition. The objective was to determine the efficacy of one (one herbicide application per season) and two-pass (two herbicide applications per season) herbicide programs using PRE and POST herbicides in glyphosate-resistant corn and to attempt to quantify the possible nitrogen loss from delaying herbicide application timings from glyphosate.

The first study composed of one-pass and two-pass herbicide weed control programs. Weed control failures occurred 29% more often using one-pass systems compared to two-pass programs utilizing PREs and yield reductions occurred more often in one-pass systems. Overall, two-pass systems which included the use of a PRE herbicide resulted in more consistent weed control across all species than one-pass POST treatments.

The second study consisted of PRE herbicide treatments to favor grass, broadleaf, or mixed weed populations at multiple glyphosate application timings. To document nitrogen loss, weed biomass, leaf chlorophyll meter readings, and stalk nitrate testing was measured. Grass weeds were more detrimental to yield than broadleaf weeds. Chlorophyll meter readings documented nitrogen deficiency between treatments. Corn leaf chlorophyll meter readings taken at tasseling correlated strongly to the resultant grain yield ($R^2 > .84$). Higher year-end stalk nitrate accumulations were reflective of higher grain yield.