

IDENTIFICATION AND CHARACTERIZATION OF GLYPHOSATE-RESISTANT COMMON RAGWEED

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ABSTRACT

A revolution in production agriculture has occurred over the past decade; the development and use of herbicide-resistant crops. Glyphosate is an effective, broad spectrum and offers flexible application timing with minimal crop injury. With glyphosate's high efficacy rate and increased adoption over many hectares, it could be argued that where it is applied at least one or more times a cropping year, resistant weeds will occur frequently. In 2002, a Missouri population of common ragweed (*Ambrosia artemisiifolia*, L.) was inadequately controlled with glyphosate following six years of continued use. Under greenhouse conditions, common ragweed seedlings were treated at 8-12 cm with glyphosate. At rates that varied from 1/16X to 12X (1X=0.84 kg ae/ha) for the suspect resistant population, and 1/256X to 1X for a known susceptible population. The suspect resistant population exhibited an I_{50} value that was 9.6-fold higher than the susceptible biotype on a dry weight basis. This confirms the suspect common ragweed population to be resistant to glyphosate and represents the 6th weed species world-wide with resistance to glyphosate.

Field observations of glyphosate-resistant common ragweed plants revealed that several plants surviving glyphosate were infested with a stem-boring insect, commonly known as ragweed borer (*Epiblema strenuana*, Walker). Field experiments were initiated to evaluate whether or not the ragweed borer influenced common ragweed response to glyphosate. The outcomes of these experiments provide evidence that glyphosate response in the glyphosate-resistant common ragweed is influenced by glyphosate rate and the timing of applications; with ragweed borer not a significant factor influencing plant response.