

Experiences with glyphosate-resistant horseweed (*Conyza canadensis* (L.) Cronq.) in the eastern United States

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Summary Glyphosate-resistant horseweed (*Conyza canadensis* (L.) Cronq.) was confirmed in Delaware in 2000. Since then over thirty fields have been confirmed in the states of Delaware, Maryland, and New Jersey. There is approximately a 10-fold level of susceptibility between the resistant and susceptible populations.

Horseweed is an annual plant that traditionally has been classified as a winter annual. However, horseweed plants have been observed to emerge year round. Research is going on to document emergence pattern of horseweed in the Delaware and to determine if there is a difference between the glyphosate-resistant and -susceptible populations. Plants that emerge in mid to late summer do not survive the winter.

The glyphosate-resistant populations have been located in fields with no-till soybeans (*Glycine max*) that had been treated only with glyphosate, pre- and post-plant. Some fields have been planted with no-till soybeans on an annual basis. However, when the field histories of the thirty resistant fields have been evaluated, some of the fields have had very diverse crop rotations. For instance, one field was tilled in the

two previous years and had not had been treated with glyphosate for two seasons. Factors other than cropping sequence and pattern of herbicide use must be contributing to the spread of the resistant plants.

Glyphosate-resistant and -susceptible horseweed plants that had begun to bolt (four months after planting), large rosette stage (three months after planting) and seedling stage (one month after planting) were treated with 0.4, 0.8, 1.5, 3.0, 6.0, and 12 kg a.e. ha⁻¹ of glyphosate. Susceptible plants were controlled (>90% control) with rates of 1.5 kg a.e. ha⁻¹ or higher, while no rate of glyphosate provided greater than 75% control of the resistant population. For the susceptible population treated with 0.8 kg a.e. ha⁻¹, the bolted plants, large rosette, and seedling stage plants resulted in 75, 87, and 92% control, respectively.

Additional research is to be conducted to better understand the biology and management of the resistant biotypes.

Keywords *Conyza canadensis*, glyphosate, glyphosate resistance.