

Spread of Herbicide Resistant Weeds in Illinois  
and  
Factors that Prevent Presence of Herbicide Resistance in Illinois Fields

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Abstract

The continual evolution of weed species and populations resistant to herbicides from one or more mechanism-of-action families represents one of the most daunting challenges faced by weed management practitioners. Currently in Illinois, biotypes of 12 weed species have been confirmed resistant to one or more herbicide mechanisms of action. Resistance to herbicides that inhibit the ALS enzyme is the most common type of resistance in Illinois. Waterhemp has evolved resistance to more herbicide mechanisms of action than any other Illinois weed species, including resistance to inhibitors of acetolactate synthase (ALS), photosystem II (PSII), protoporphyrinogen oxidase (PPO), enolpyruvyl shikimate-3-phosphate synthase (EPSPS) and hydroxyphenyl pyruvate dioxygenase (HPPD). Not every individual waterhemp plant is resistant to one or more herbicides, but the majority of field-level waterhemp populations contain one or more types of herbicide resistance. Perhaps even more daunting is the occurrence of multiple herbicide resistances within individual plants and/or fields. Waterhemp plants and populations demonstrating multiple herbicide resistance are becoming increasingly common and greatly reduce the number of herbicide options that remain effective for their control. Integrated weed management programs offer the greatest potential for long-term, sustainable solutions for weed populations demonstrating resistance to herbicides from multiple families.

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