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Weed resistance, shifts, tactics, and alternatives in soybeans

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Weed resistance, shifts, tactics, and alternatives in soybeans

Abstract

Iowa State University reported the existence of glyphosate-resistant common waterhemp in 1998, and it is clear that the evolution of glyphosate-resistant weeds is increasing at a notable rate. However, the relative economic importance of glyphosate-resistant weed biotypes in Iowa has to date not been of major consequence. However, the lack of significant glyphosate resistance in Iowa weed communities can be anticipated to change based on reports and observations of glyphosate-resistant weed biotypes in neighboring states and anecdotal comments from the agricultural community. Furthermore, the occurrence of Asiatic dayflower and other weed population shifts attributable to selection pressure from glyphosate use is more frequent.

Keywords

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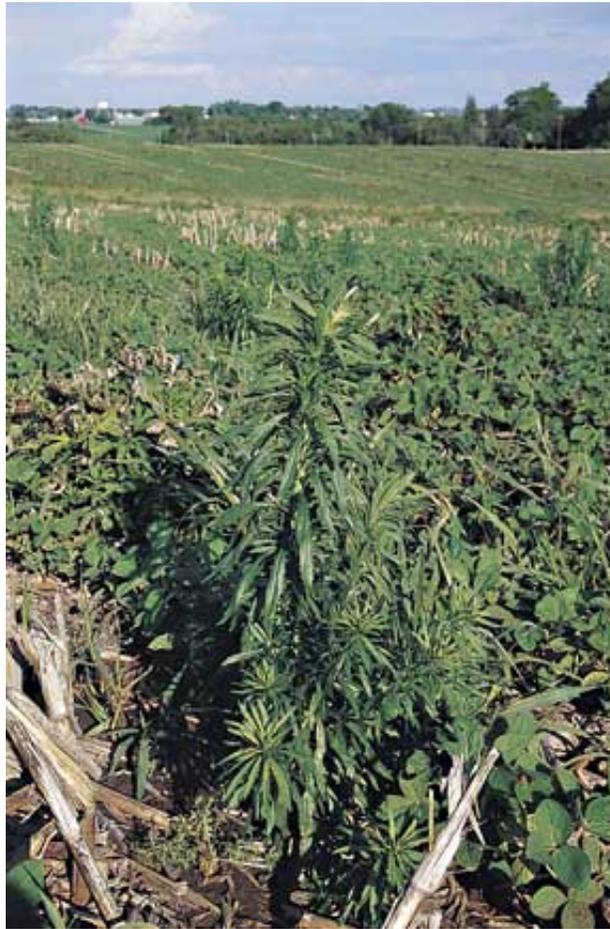
by Mike Owen, Department of Agronomy

Iowa State University reported the existence of glyphosate-resistant common waterhemp in 1998, and it is clear that the evolution of glyphosate-resistant weeds is increasing at a notable rate. However, the relative economic importance of glyphosate-resistant weed biotypes in Iowa has to date not been of major consequence. However, the lack of significant glyphosate resistance in Iowa weed communities can be anticipated to change based on reports and observations of glyphosate-resistant weed biotypes in neighboring states and anecdotal comments from the agricultural community. Furthermore, the occurrence of Asiatic dayflower and other weed population shifts attributable to selection pressure from glyphosate use is more frequent.

Weed management programs that are highly effective but narrow in the scope of tactics included exert the greatest selection pressure on the weed community causing changes in the economic prominence of specific weeds. These changes are inevitable unless diverse weed management tactics are used. Iowa State University recommends the use of alternative tactics such as cultivation and rotary hoeing in soybean production. However, there is considerable reluctance to use mechanical weed control tactics, particularly in reduced and no-tillage systems. Thus, a more acceptable choice to increase the diversity of weed management tactics resulting in reduced selection pressure on the weed community is to apply residual herbicides before or immediately after planting. The use of early preplant (EPP) or preemergence (PRE) herbicides is intended to delay the development of weeds allowing the soybeans to become more competitive and providing a better opportunity for a timely postemergence (POST) herbicide application.

There are significant benefits of an EPP or PRE herbicide application, including better time management in the spring when time availability during planting is critically short, better (longer) window of opportunity to make POST treatments, better environmental stewardship, and improved profitability. Recognize that a clean field at the end of the season does not necessarily mean that the weed management program was successful. Glyphosate-based programs can control larger weeds and can be applied later in the season thus providing excellent weed control when viewed in September; however, if weeds caused reductions in soybean yield potential in May and June, profitability was forfeited. The objective of using herbicides is to protect soybean yield, not to control weeds. Furthermore, the use of EPP and/or PRE herbicides also will serve to reduce selection pressure on the weed community thus slowing the evolution of herbicide-resistant weeds

or weed population shifts.



Marehail in no-till soybeans and demonstrating the benefits of mechanical weed management. (Mike Owen)

Mike Owen is a professor of agronomy with research and extension responsibilities in weed management and herbicide use.

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