

## Preserving the value of glyphosate

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**February 20, 2004** - It is well known that glyphosate-resistant horseweed (also known as maretail) populations have been selected in Roundup Ready soybean and cotton cropping systems. Resistance was first reported in Delaware in 2000, a mere 5 years after the introduction of Roundup Ready soybean. Since that initial report, glyphosate-resistant horseweed is now reported in 12 states and is estimated to affect 1.5 million acres in Tennessee alone.

A person could ask if this is any indication of what might lie ahead. On one hand, it has been proposed in a [popular advertisement](#) that glyphosate-resistant weeds are unlikely to occur if glyphosate is frequently used, as long as glyphosate is applied at full rates. The recommendations in this advertisement, in part, are based on several long-term university studies of Roundup Ready cropping systems. We feel a person should ask whether or not these studies can prove that resistance will or won't happen. It is our belief that these studies are not large enough to test if resistance will develop. For example, the University of Wisconsin has a 7 year Roundup Ready cropping system trial. This trial has horseweed in the no-till plots. Despite burndown and in-crop treatments with glyphosate, glyphosate-resistant horseweed has not developed in this study. Since this trial did not find glyphosate-resistant horseweed, does this mean that glyphosate-resistant horseweed cannot develop? Does it mean that the resistant horseweed in Ohio or Tennessee or Delaware is not truly resistant? Obviously not. Small scale trials cannot prove that some event will not occur when a larger scale is considered. In total, these Roundup Ready cropping system trials may only be testing continuous glyphosate use on perhaps 50 acres, which is an extremely small area compared to the total acres relying on glyphosate as a primary management tool. The true trial to determine if a rare event like glyphosate-resistant weeds will develop is actually being tested on the tens of millions of acres of Roundup Ready corn, soybean, and cotton that are sprayed each year.

Many weed scientists across the Midwest have warned of the potential for additional glyphosate-resistant weeds if a "high selection pressure" is maintained. In this case, "high selection pressure" refers to the repeated use of glyphosate without interruption by herbicides with other modes of action or other weed management practices. This potential was confirmed at the North Central Weed Science Society Meeting where glyphosate-resistant common ragweed weed was reported. This is the first report of glyphosate-resistance in common ragweed. It was identified in a Missouri no-till soybean field that has been in continuous soybean production (with some double crop wheat) for many years and in Roundup Ready soybean since 1996. This field had a high selection pressure for glyphosate resistance with one or more glyphosate applications per year. This is the second example of a glyphosate-resistant weed developing in a Roundup Ready cropping system. We do not know which weed species will be the next to develop glyphosate resistance or when it will occur, but high selection pressure will likely result in additional cases of resistance.

Midwest weed scientists appreciate the value that glyphosate and Roundup Ready crops offer to growers. We hope that growers and crop advisors will evaluate how they use glyphosate and the Roundup Ready technologies to gain the value of these technologies without increasing the risk of resistance.

Ideally, we recommend:

- 1) tank mixing glyphosate with another mode of action like 2,4-D in burndown treatments when glyphosate will be applied in the subsequent crop,
- 2) alternating glyphosate use with other herbicide modes of action between years, and
- 3) incorporating appropriate integrated weed management practices such as cultivation.

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