

1/15/07 University of Missouri Extension Agronomy Update
Risks and Benefits of Glyphosate-Resistant Cropping Systems
Julie Abendroth, MU Regional Agronomist: 816/776-6961

Recently, a report was released on the risks and benefits of glyphosate-resistant crops. Compiled by a lead USDA Weed Scientist in glyphosate research, Dr. Stephen Duke, the report notes that approximately 60% of the global soybean crop is now glyphosate resistant. Interestingly, the report noted that in 2005, almost 90% of the 250 million acres of transgenic crops grown annually worldwide were glyphosate-resistant alone or had glyphosate-resistance genes stacked with Bt resistance genes.

With the introduction of glyphosate resistant soybeans, U.S. soybean farmers have reduced tillage, resulting in a large annual savings on tillage costs. In a five-year period in which the number of glyphosate-resistant soybean acres increased from only a few percent to nearly 70%, there was a dramatic increase in the adoption of no-tillage and reduced tillage management. In 2003, researchers investigated the environmental effects of glyphosate-resistant soybeans versus non-transgenic soybeans for over 1400 Midwest farms, with the report finding that glyphosate-resistant soybean technology was more environmentally friendly than other technologies for U.S. farms.

Due to the widespread use of glyphosate and the high selection pressure this places on weed populations, the report notes weed resistance and weed shifts as the primary risk with glyphosate-resistant crops. Weed species with some natural resistance have increased under glyphosate-resistant cropping practices.

This has recently been made evident, as Purdue and Ohio State researchers have now confirmed glyphosate-resistant giant ragweed populations in Indiana and Ohio. The Indiana giant ragweed population is located in a field which has been in soybean six out of the last seven years, with glyphosate being the sole herbicide applied for giant ragweed control. Three fields were found to possess glyphosate-resistant giant ragweed in Ohio.

Many soybean producers in Missouri have reported poor control of giant ragweed with multiple glyphosate applications. Producers are encouraged to monitor the weed and adjust their herbicide programs accordingly. There are few effective postemergence herbicides for giant ragweed in soybean; once we lose the ability to control giant ragweed effectively with glyphosate, postemergence herbicide options are limited to FirstRate and the PPO inhibitors, Flexstar and Cobra. Research studies have noted a 70% soybean yield loss when 3-4 giant ragweed plants are present per square yard. Growers who have fields with a history of poor control of giant ragweed should therefore change their management tactics before the 2007 season is underway. A burndown/preemergence application with 2,4-D and a residual herbicide is recommended.