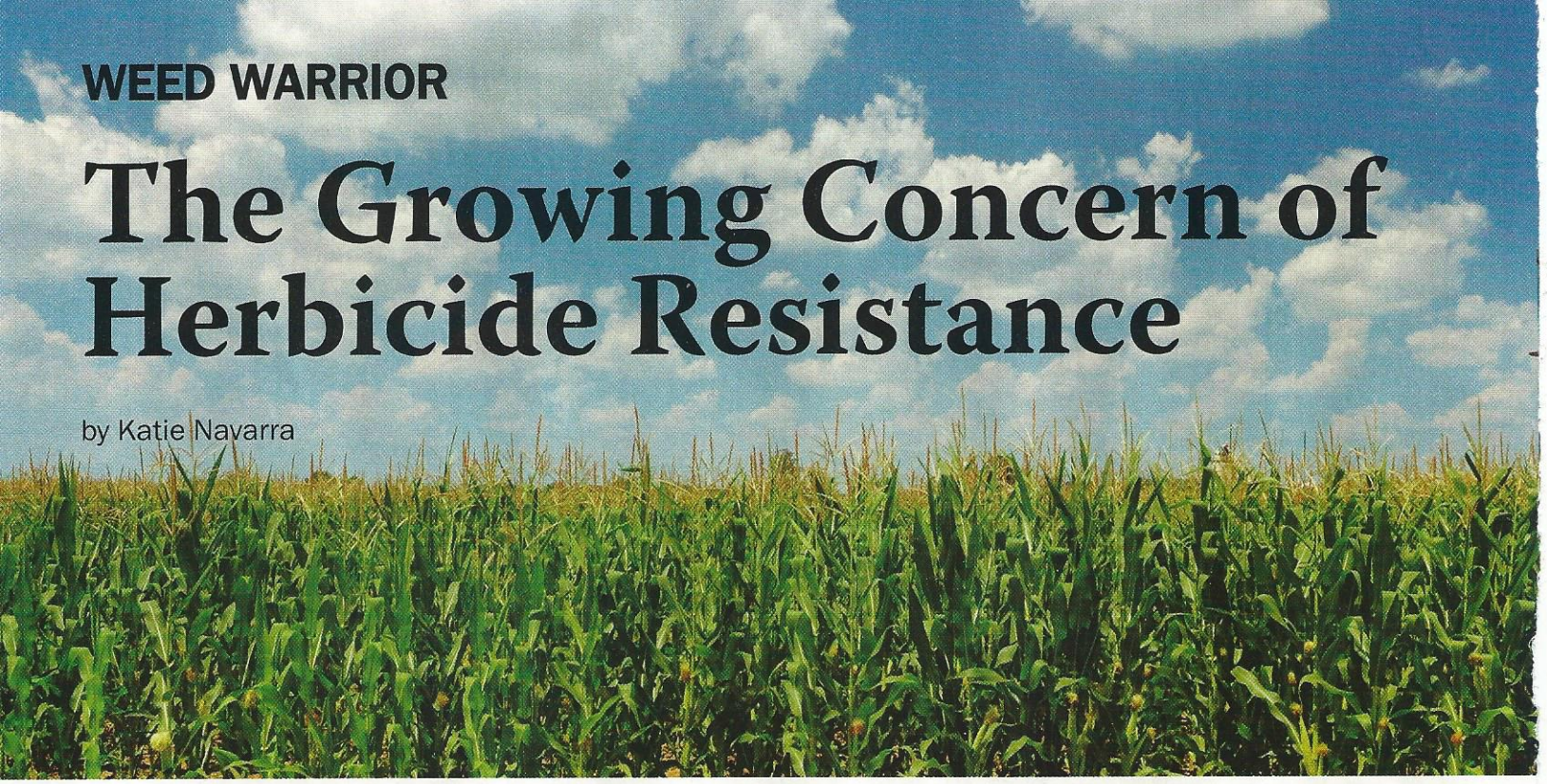
The Growing Concern of Herbicide Resistance

by Katie Navarra



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"Millions of acres of farmland in the U.S. have been affected by herbicide-resistant weeds, rendering some fields unable to be farmed. And the problem is spreading, which could mean more lost crops and lost profits," according to a PBS NewsHour special aired November 14, 2014.

Though the special focused on products that rely on the chemical glyphosate, which genetically modified corn, soybean and cotton seeds were developed to withstand, without careful use of all herbicides weed resistance will likely pop up among other crops and chemicals too.

A national issue

"Herbicide resistance is growing," cautioned Laura Griffen McDermott, a regional agricultural specialist with Cornell Cooperative Extension-Washington County, New York. "It's currently a significant problem in the Midwest, but we are seeing some issues with resistance for just a few growers [in New York]."

It's also of increasing importance in agriculture. When herbicides are repeatedly used to control weeds, the weeds that survive the treatment can multiply and spread.

"Weed control in major crops is almost entirely accomplished with herbicides today," Secretary of Agriculture Tom Vilsack stated. "USDA, working in collaboration with the Environmental Protection Agency, must continue to identify ways to encourage producers to adopt diverse tactics for weed management in addition to herbicide control."

In early November 2014, the U.S. Department of Agriculture (USDA) announced measures to help farmers diversify their weed control efforts. In coming months, the USDA will move forward with the following provisions:

- The USDA's Natural Resources Conservation Service (NRCS) will offer financial assistance under its Environmental Quality Incentives Program (EQIP) for herbicide-resistant weed control practices that utilize integrated pest management plans and practices.
- The NRCS will solicit proposals under the Conservation Innovation Grants (CIG) Program for innovative conservation systems that address herbicide resistance.
- The USDA's Animal and Plant Health Inspection Service (APHIS) will actively promote the use of best management practices (BMPs) in design protocols for regulated authorized releases of genetically engineered (GE) crops and will include recommendations for BMPs with the authorization of field trials of herbicide-resistant (HR) crops.
- The USDA is partnering with the Weed Science Society of America (WSSA) and is providing funds to develop education and outreach materials for various stakeholders in managing herbicide-resistant weeds.

Take action now

Don't wait until programs from the USDA and their collaborating partners become available; you can begin using basic tactics to help reduce the further development of herbicide-resistant weeds.

Rotate chemical classes. "You never want to spray the same herbicide back-to-back with another product that has the same mode of action," said McDermott. Look for an herbicide in a different chemical class.

Select the correct chemical. "In order to do that you need to have a correct ID of the weed to understand the label as to the recommended timing of application for that crop and that weed," McDermott explained. Local extension agencies and agricultural universities can assist with weed ID if you're unsure of the weeds on your land.

Plan crop rotation. This can become an integral part of a weed management program. Alternate crops based on season of germination. Rotate annual and perennial crops or dense crops with open crops. The changing crop composition helps eliminate the niche growing environment weeds need to survive.

Use cover crops. Cover crops can provide a non-herbicide option for weed management. To be effective the cover crop must match the climate and the season it will be used in. It should also be planted at optimum seeding depths. A poorly cared for cover crop can become a weedy mess, so it's critical the crop is selected carefully and cared for.

Consider cultivation in coordination with herbicide application. "If done properly, cultivation will take out weeds missed by herbicides," said John Shenk, owner of Hillside Cultivator and Shenk Berry Farm. Well-developed herbicides are designed to stay within the top 1 to 2 inches of the soil. Shallow cultivation following an herbicide appli-

cation can tackle the weeds left behind.

Incorporate natural weed management techniques. Producers that are not organic growers can consider weed management practices used by organic growers whenever possible. "Burning, mulching and growing through plastic are techniques that organic or natural growers are using to control weeds," said Ted Stutz with Ohio Earth Food.

Consider the weather before an application. To be effective, herbicides must be applied properly and in accordance with the label. "I see people spraying when it's too windy just to get it done," Shenk noted. Wind can prevent weeds from receiving the proper herbicide dosage and can drift to neighboring crops, potentially damaging crops not able to withstand the specific herbicide.

Find resources

Understanding the variety of weed management tactics available is critical. Attend educational meetings sponsored by local research universities and cooperative extensions. "We have applied for a Resistance Management training and education grant through NE SARE [Northeast Sustainable Agriculture Research and Education], but will not find out if we have been funded until midwinter," McDermott noted.

Other agencies offer similar in-person and online trainings to educate growers on the alternatives to relying solely on herbicides for weed management.

Producers are searching for a new, simple solution to weed management, but, unfortunately, there is no silver bullet. However, careful use of herbicides in combination with non-herbicide practices will likely provide the long-term solution to reducing the occurrence of herbicide-resistant weeds. ●

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