Roundup resistant weeds pose environmental threat

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(AP) -- When the weed killer Roundup was introduced in the 1970s, it proved it could kill nearly any plant while still being safer than many other herbicides, and it allowed farmers to give up harsher chemicals and reduce tilling that can contribute to erosion.

But 24 years later, a few sturdy species of weed resistant to Roundup have evolved, forcing farmers to return to some of the less environmentally safe practices they abandoned decades ago.

The situation is the worst in the South, where some farmers now walk fields with hoes, killing weeds in a way their great-grandfathers were happy to leave behind. And the problem is spreading quickly across the Corn Belt and beyond, with Roundup now proving unreliable in killing at least 10 weed species in at least 22 states. Some species, like Palmer amaranth in Arkansas and water hemp and marestail in Illinois, grow fast and big, producing tens of thousands of seeds.

"It's getting to be a big deal," said Mike Plumer, a 61-year-old farmer and University of Illinois agronomist who grows soybeans and cotton near the southern Illinois community of Creal Springs. "If you've got it, it's a real big deal."

When Monsanto introduced Roundup in 1976, "it was like the best thing since sliced bread," said Garry Niemeyer, who grows corn and soybeans near Auburn in central Illinois.

The weed killer, known generically as glyphosate, is absorbed through plants' leaves and kills them by blocking the production of proteins they need to grow. At the same time, the U.S. Environmental Protection Agency considers it to have little toxicity to people and animals, and aside from the plants it's sprayed on, it's less of a threat to the environment because it quickly binds to soil and becomes inactive.

Monsanto's introduction of seeds designed to survive Roundup made things even better for farmers because they could spray it on emerging crops to wipe out the weeds growing alongside them. Seeds containing Monsanto's Roundup Ready traits are now used to grow about 90 percent of the nation's soybeans and 70 percent of its corn and cotton.

With increased reliance on Roundup, herbicide use on corn decreased from 2.76 pounds an acre in 1994 to 2.06 in 2005, the most recent year for which the U.S. Department of Agriculture has data. Spread that out over the 81.8 million acres planted in 2005, and it's a decrease of more than 57 million pounds of herbicides annually.

Farmers also found they could cut back or in some cases eliminate tilling, reducing erosion and fuel use.

But with any herbicide, the more it's used, the more likely it'll run into individual plants within a species that have just enough genetic variation to survive what kills most of their relatives. With each generation, the survivors represent a larger percentage of the species.

St. Louis-based Monsanto maintains the resistance is often overstated, noting that most weeds show no sign of immunity.

"We believe that glyphosate will remain an important tool in the farmers' arsenal," Monsanto spokesman John Combest said.

That said, the company has started paying cotton farmers $12 an acre to cover the cost of other herbicides to use alongside Roundup to boost its effectiveness.

The trend has confirmed some food safety groups' belief that biotechnology won't reduce the use of chemicals in the long run.

"That's being reversed," said Bill Freese, a chemist with the Washington, D.C.-based Center For Food Safety, which promotes organic agriculture. "They're going to dramatically increase use of those chemicals, and that's bad news."

The first weeds in the U.S. that survived Roundup were found about 10 years ago in Delaware.

Agricultural experts said the use of other chemicals is already creeping up. Monsanto and other companies are developing new seeds designed to resist older herbicides like dicamba and 2,4-D, a weed killer developed during World War II and an ingredient in Agent Orange, which was used to destroy jungle foliage during the Vietnam War and is blamed for health problems among veterans.

Penn State University weed scientist David Mortensen estimates that in three or four years, farmers' use of dicamba and 2,4-D will increase by 55.1 million pounds a year because of resistance to Roundup. That would push both far up the list of herbicides heavily used by farmers.

Dicamba and 2,4-D both easily drift beyond the areas where they're sprayed, making them a threat to neighboring crops and wild plants, Mortensen said. That, in turn, could also threaten wildlife.

"We're finding that the (wild) plants that grow on the field edges actually support beneficial insects, like bees," he said.

In Australia, weed scientist Stephen Powles has been a sort of evangelist for saving Roundup, calling it a near-miraculous farming tool.

Australia has been dealing with Roundup-resistant weeds since the mid 1990s, but changes in farming practices have helped keep it effective, Powers said. That has included using a broader array of herbicides to kill off Roundup resistant weeds and employing other methods of weed control.

Those alternative methods, such as planting so-called cover crops like rye to hold back weeds during the winter and other times when fields aren't planted with corn, soybeans or cotton, are the key, said Freese, the Center For Food Safety chemist.

Otherwise, he said, "We're talking a pesticide treadmill here. It's just coming back to kick us in the butt now with resistant weeds."