Palmer amaranth threatens Midwest farm economy, researchers report

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University of Illinois crop sciences professor Aaron Hager is warning Illinois farmers about Palmer amaranth, an invasive weed that can take over farm fields in a season or two. Credit: L. Brian Stauffer

An invasive weed that has put some southern cotton farmers out of business is now finding its way across the Midwest – and many corn and soybean growers don't yet appreciate the threat, University of Illinois researchers report.

Palmer amaranth (*Amaranthus palmeri*), a flowering plant native to the Sonoran desert and southwest United States, has a laundry list of traits that make it a fierce competitor on the farm, said Aaron Hager, a University of Illinois crop sciences professor.

Palmer amaranth germinates throughout much of the growing season, starts earlier and grows faster than other weeds, and is a prolific seed producer, Hager said. It can tolerate drought and heat extremes that would kill other plants. And it is becoming resistant to the most common herbicides used to combat it, he said.

Killing the plant before it can go to seed is the best way to control it, he said. That means treating young plants with herbicides when they are less than 4 inches tall.

"Once it is taller than 4 inches, the effectiveness of herbicide treatments drops off very dramatically and very quickly," Hager said.

Catching the plant that early is problematic, however. As a seedling, Palmer amaranth looks a lot like waterhemp, another problematic weed that is difficult to control. This means farmers have the dual challenge of determining whether Palmer has invaded their fields and, if it has, taking effective action to kill it before it takes over.

"In other parts of the U.S., this species has devastated cotton production and in many areas, especially in Georgia, it was not uncommon to see cotton fields literally mowed down to prevent this weed from producing seed," Hager said. Some growers who failed to recognize the threat lost their farms as a result, he said.

Palmer amaranth grows very fast, germinates throughout the season, produces lots of seeds, can tolerate heat extremes and is very adaptable, researchers report. Credit: Aaron Hager

Preventing a Palmer amaranth takeover also comes at a cost, however. In 2010, for example, Southeast Farm Press reported that the cost of weed control efforts on Georgia farms had risen from $25 per acre to $60 to $100 an acre in response to Palmer amaranth invasions. The state spent at least $11 million in 2009 to manually remove Palmer amaranth from 1 million acres of cotton, "something not normally done," the magazine reported.

Adam Davis, a researcher with the U.S. Department of Agriculture Agricultural Research Service and a professor of crop sciences at the U. of I., reported at a recent agricultural conference that Palmer amaranth can reduce soybean yields by 78 percent and corn yields by 91 percent. Illinois, a state with a $9 billion agricultural commodities market and 80

percent of its land area devoted to farming (mostly corn and soybeans), could see significant losses associated with fighting – or failing to properly fight – this weed, Hager said.

"If you think about the value of agronomic row crops in this state, that's why we're very, very concerned about how devastating this could be to us," he said.

So far, researchers have confirmed the presence of Palmer amaranth in more than two dozen Illinois counties, from the southern tip of the state to Will County, about 50 miles south of downtown Chicago. In about half of those counties, the weed is already resistant to glyphosate, the most commonly used herbicide on Midwest farms, Hager said.

The plant grows so quickly and so tall that it can completely obscure low-growing crop plants. Some soybean fields in Kankakee County, Illinois, became so overgrown with Palmer amaranth that the soybeans were barely visible to the eye.

Many farmers think they can use the same techniques that tend to work against other common weeds – a onetime application of glyphosate herbicide, for example – to control Palmer amaranth, Hager said. This assumption could endanger their farms.

"There is not one magic herbicide that a farmer could use one time and be done with it," he said. "It doesn't work that way."

And if the weed gains a foothold in planted fields, corn and soybean growers in Illinois should take a tip from Georgia cotton farmers and do everything possible to remove the plants, he said. Not a single plant should be tolerated.

"We have to set the threshold at zero. It has to be zero," Hager said. "It's

hard to imagine another weed species that would be more injurious to crop production than what this one will be."

More information: The U. of I. has set up a service to help farmers identify the plant in their fields and test whether it is resistant to common herbicides. They also published a series of guidelines for controlling the plant.

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