

OSU researcher targets weeds

By MATEUSZ PERKOWSKI
Capital Press



Mateusz Perkowski/Capital Press

Carol Mallory-Smith, a weed science professor at Oregon State University, studies herbicides that can be used on specialty crops in the Northwest and in recent years has also been drawn into some of the controversies over genetic engineering.

tolerance becomes more widespread and reduces the herbicide's effectiveness.

That process can occur faster than anticipated, as Mallory-Smith found out while studying for her doctorate, when she identified one of the first weeds resistant to the sulfonylurea class of herbicides.

The prickly lettuce was discovered in a field where the University of Idaho had conducted research for years. As it turned out, a high mutation rate allowed the weed to overcome the chemical's enzyme-inhibiting properties.

"It was unexpected. The chemistry was really new," she said.

Herbicide resistance has become an even more prominent issue in agriculture due to its association with genetic engineering.

Major commodity crops, including corn, soybeans and cotton, have often been genetically modified to withstand herbicides such as glyphosate.

The technology makes killing weeds easier without hurting crops, but the increased reliance on herbicides has also caused more weeds to develop resistance.

Mallory-Smith considers herself an "agnostic" when it comes to genetic engineering,

but thinks herbicide-resistant crops could have been managed more carefully.

The agricultural industry embraced the technology, believing it would "solve all our problems," without relying enough on tactics that would slow the adaptation of weeds, she said. "Now we're sort of back where we started."

The phenomenon of genetically engineered crops spurring herbicide resistance in weeds is primarily occurring in the Midwest, where commodity crops are grown.

However, that fact has hardly insulated Mallory-Smith from the controversies surrounding biotechnology.

Her involvement in the 2013 discovery of biotech wheat growing unauthorized in an Eastern Oregon field was a notable episode that attracted global attention.

When a farmer realized that some of his volunteer wheat wasn't dying after being sprayed with glyphosate, he brought samples to OSU for analysis.

Mallory-Smith believed there was "no way" the herbicide-resistant wheat was a genetically engineered by Monsanto, since research and development of that cultivar had been halted a decade earlier.

Carol Mallory-Smith

Occupation: Weed science professor at Oregon State University

Education: Ph.D. in plant science from the University of Idaho in 1990, bachelor of science in plant protection from the University of Idaho in 1986

Age: 67

Hometown: Albany, Ore.

Family: Husband, Robert, four grown children and 12 grandchildren

"It made no sense that it would be," she said.

DNA testing of the wheat revealed that it was, in fact, the Monsanto variety, which had never been deregulated by USDA.

Its source was never discovered, but the finding did temporarily disrupt Asian export markets and resulted in a class action lawsuit by farmers that Monsanto eventually settled for \$2.7 million.

Mallory-Smith was also drawn into a long-running dispute over glyphosate-resistant sugar beets, which were the subject of several lawsuits by biotech critics before the USDA ultimately deregulated them in 2012.

The plaintiffs bolstered their request for an injunction against the crop with a written declaration from Mallory-Smith stating that viable roots of the transgenic variety

had been found in compost mix. The incident was cited as an example of the difficulty containing the crop.

Monsanto also relied on Mallory-Smith in its arguments against an injunction with a declaration in which she supported the company's safeguards for growing the crop while USDA studied its environmental impacts.

It's painful to watch such conflicts erupt within agriculture, Mallory-Smith said. Her philosophy is to approach such disputes as forthrightly as possible.

"Sometimes it's going to be fine, sometimes people are going to be upset with you," she said.

Currently, Mallory-Smith is studying a subject that's touchy among farmers and seed companies in Oregon's

Willamette Valley: canola production.

When state lawmakers imposed a moratorium on most canola production in the region, they also directed OSU to conduct a three-year study on weed, disease and pest risks posed by the crop.

Specialty seed companies fear such problems will increase if it becomes prevalent, but the possibility of genetically engineered canola cross-pollinating with related vegetable species has also cast a shadow over the crop.

For now, Mallory-Smith remains tight-lipped about the results of her study, but the controversy is likely to flare up again when her report is released in late 2017.

But not all of her work takes place in the spotlight.

A key part of Mallory-Smith's job is evaluating herbicides for safety and efficacy in specialty crops that are grown in the Northwest.

Chemical companies conduct such analysis for major commodity crops, but it's not economically justifiable for them to examine crops grown on small acreage.

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