

Atrazine is the main weapon against weeds in sweet corn, with few alternatives

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Life without atrazine would complicate weed management in corn, especially for sweet corn growers. A study at the University of Illinois looked at 175 sweet corn fields in the Midwest to find out just how important this 50-year-old, broad-spectrum herbicide is in sweet corn grown for processing.

"If the use of atrazine was phased out completely, our data indicate the greatest burden would be on those growers who rely on less tillage for weed control, have particularly weedy fields, have early season crop production, and grow sweet corn in rotation with other vegetables such as snap or lima beans," said U of I and USDA Agricultural Research Service ecologist Marty Williams. "[Vegetable crops](#) have fewer herbicide options and there tends to be poorer levels of weed control in those crops. When more weeds escape, more weed seed are produced, and crops succeeding those vegetables can have challenging weed problems."

The U.S. [Environmental Protection Agency](#) completed re-registration of atrazine in 2006, but due to controversy over human health and environmental safety concerns, launched a special review and re-evaluation of atrazine last November.

Registered use rates have been in decline for several decades, and atrazine use is increasingly being scrutinized at state and federal levels. Atrazine use in field corn dominates the debate; sweet corn represents only about 1 percent of total corn acres being treated with atrazine. But because atrazine may be far more important in sweet corn production, Williams wanted to assess how atrazine is currently being used by sweet corn growers, and how an EPA ban on atrazine might affect them.

"Atrazine is the single most widely used herbicide in sweet corn, applied to fields before crop

emergence, after crop emergence, or at both times," Williams said. "Manufacturers of many of the other herbicides recommend tank-mixing with atrazine to increase their products' effectiveness."

In the study, Williams observed that atrazine is applied to two-thirds of the acres of sweet corn in the Midwest, and row cultivation is used on about half of the sweet corn acreage. "When growers didn't use atrazine, they used more row cultivation. And that makes sense," said Williams. "The grower using less atrazine is trying to make up for reduced weed control with row cultivation."

The average total cost of weed management in sweet corn was about \$50 per acre, with atrazine accounting for only 9 percent of that cost. "We ran a simple scenario to see what it would cost for growers to switch from using atrazine to broad-spectrum broadleaf herbicide mesotrione and found that it would cost an additional \$9.2 million, taking into account all of the sweet corn acreage, not just the 175 fields in the study. This scenario didn't account for the weeds that mesotrione doesn't control and atrazine does - it was just replacing one herbicide with another, but at least it gives us an initial, conservative figure of the value of atrazine to the sweet corn grower."

Williams noted that currently a few sweet corn fields get mesotrione, so it's already being used a bit. Of course, the makers of mesotrione recommend using atrazine to improve weed control; this recommendation holds true of similar postemergence herbicides.

Restrictions on atrazine are noteworthy in Wisconsin, where all use is prohibited in certain areas. "Some growers have already had to find a system without atrazine and they're able to grow sweet corn. So it's not impossible," he said.

Williams believes the data from the study can help with long-term planning. "There are several benefits

to reduced tillage, but very little sweet corn is grown in no-till. So, if we move away from both tillage and atrazine, what are we going to use to manage the weeds?" Williams' team estimates that over one-half of sweet corn fields are losing yield due to incompletely controlled weeds, even with atrazine and tillage.

One of Williams' prior studies was to find [sweet corn](#) varieties with larger canopies that would provide more shade, making it more difficult for weeds to gain ground. He noted that there is progress in using other physical and alternative [weed control](#) tactics such as flaming, mechanical weeding, and crop varieties that suppress weeds, but use of such tactics requires more management than spraying an herbicide.

"If the regulatory decision is that we can't use atrazine in ways that ensures protection of the environment and human health, then growers will need immediate, economically viable weed management alternatives", Williams said. "For now, such alternatives to replace atrazine are not well developed or demonstrated."

Provided by University of Illinois College of Agricultural, Consumer and Environmental Sciences

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