

WEED SCIENCE
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Scientists Pursue New Sustainable Alternatives for Weed Control in Organic Production Systems

LAWRENCE, Kansas – October 19, 2010 – What is the most critical problem facing today’s organic grower? The USDA’s Invasive Weed Management Unit says the answer is weeds. They rob fields of moisture, compete with crops for nutrients, reduce yields and drive up costs.

But a number of innovative research projects are underway to improve tried and true weed control strategies and to explore new alternatives that can benefit organic crops.

A few examples: The Global Change and Photosynthesis Research Unit of USDA’s Agricultural Research Service is exploring practical ways to reduce the persistence of weed seeds – a long-standing goal for weed scientists. Researchers at Ohio State and Purdue universities are also exploring ways to reduce the weed seed bank, while the University of Maine is exploring how to control weeds through improved crop rotation techniques. Researchers at the same universities are working with the University of California at Davis and Wageningen University in The Netherlands on a USDA-sponsored project to redesign extension programming for organic weed management. They are developing a best practices model that integrates scientific knowledge with the indigenous knowledge of experienced organic farmers.

One particularly innovative project underway in California involves a prototype cultivation device that uses “machine vision” to attack weeds growing in the crop row. According to Steve Fennimore, extension vegetable weed specialist with the University of California at Davis, a video camera mounted on the front of a specially designed cultivator captures images of the crop row and passes them to a computer for precise alignment. The blades of

the cultivator can then pass down the row and precisely remove weeds without causing damage to the crop.

“The prototype is expensive, so it requires a bit of a leap of faith,” Fennimore says. “But we’ve been able to reduce hand weeding in lettuce, tomato and celery crops by as much as 40 percent.”

Fennimore is quick to point out that the same innovative technology holds potential for conventional growers as well.

“Other than herbicides, the toolbox of available weed management practices is the same for all growers,” he says. “Effective weed control requires an integrated approach based on knowledge of each crop and the weeds that threaten it.”

In a survey conducted online by researchers at Rodale Institute, 85 percent of the organic growers responding use at least three weed management strategies – and most use six. The top six practices are hand weeding, mechanical control, mulches, cover crops, crop rotation and dense planting. These practices remove weeds, prevent them from being competitive or, in the case of crop rotation, inhibit weeds that prefer the growing conditions associated with certain crops.

But some of these techniques also have drawbacks. Farmers who rely on hand-weeding know it is a labor-intensive process. And the disadvantages of extensive mechanical control (tillage) are well-documented in some types of crops and fields. Tillage can promote soil erosion and rob the soil of moisture. According to the National Sustainable Agriculture Information Service (ATTRA), it also can disturb soil biology, increase runoff, decrease water infiltration, damage soil structure and even invite weeds by exposing bare ground. Such drawbacks heighten the need for scientific research focused on sustainable weed management alternatives.

“Research that advances our knowledge of the biology, ecology and management of weeds is fundamental to success on any farm, and it is vital that we do more of it,” Fennimore says. “Scientific investigation gives us a broader base of tools that can be used successfully — regardless of the size of the operation or whether a farmer chooses conventional or organic growing practices.”

About the Weed Science Society of America

The Weed Science Society of America, a nonprofit scientific society, was founded in 1956 to encourage and promote the development of knowledge concerning weeds and their impact on the environment. The Weed Science Society of America promotes research, education and extension outreach activities related to weeds, provides science-based information to the public and policy makers, fosters awareness of weeds and their impact on managed and

natural ecosystems, and promotes cooperation among weed science organizations across the nation and around the world. For more information, visit www.wssa.net.

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