Organic
farming systems
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New Ag Network
Midwest Organic Team
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A researcher using a roller/crimper, kills a cover crop of rye.

Cereal rye plowed under to build soil organic matter levels. The rye also shades the soil and hinders weed seed germination before incorporation.

Organic weed control

Dale R. Mutch

Weeds are the No. 1 concern for field crop organic farmers and pose important problems for vegetable and fruit organic farmers. This is because weeds can dramatically reduce crop yield if they are not managed and controlled. Specific weeds may also provide alternative hosts for insects and pathogens, as well as interfere with harvest either by interfering with machinery or through crop contamination. Organic farmers must use multiple tactics to manage weeds because they cannot use synthetic herbicides, and existing organically acceptable herbicides are costly and primarily limited to burndown activity. For more information see the "Integrated Weed Management" books in the reference section.

Know your weeds

As they say, "Know your enemy." Organic farmers need to pay close attention to what types of weeds are in their fields and how they grow. Know weed life cycles. Are they annual, perennial or biennial weeds? Will the weeds germinate early or mid-summer? How deep in the soil will the seeds germinate? How much seed will the weed produce? Do weeds reproduce vegetatively via rhizomes or stolons? An additional question specific to perennial crops is: Which weeds are problems at time of establishment versus post crop/planting establishment?

Care for your soil

The best line of defense is to build healthy soil. A biologically active and diverse soil will reduce weed populations and help crops grow faster. The faster a crop builds a canopy to fill rows and cover the soil, the less impact weeds will have on the crop. Decreasing weed growth dramatically reduces weed seed production. Healthy soils stimulate weed seed decay and can increase weed seed predation. Healthy soil can be built by using cover crops, choosing good crop rotation, applying compost and other organic soil amendments, maintaining appropriate drainage and reducing compaction. Generally, farmers want to keep weeds out of the field for the first four to six weeks of annual crop growth to maximize crop yield potential.

Commonly used strategies

Here are some of the practices used by organic farmers to reduce weed problems:

- If early weed species such as common lambsquarters or smartweed begin growing, consider allowing these weeds to germinate, then kill them with tillage and delay the crop planting, allowing the crop to get ahead of the weeds.

Rotary hoeing newly emerged soybeans. Gratiot County, MI.

- Increase seeding rates and narrow planting rows to give the desired crop a competitive advantage over weeds.
- Select varieties that will succeed better under organic farming methods.
- For perennial fruit and most vegetable crops, consider using mulches to "smother" weeds. These could consist of wood chips, plastic or fabric weed cloth, living mulches or, in some cases, hay or straw.

Stale seed beds

- Use tillage as a tool to control weeds. Early tillage for seed bed preparation could be moldboard plowing, chisel plowing, field cultivating, rotovating, offset discing or field cultivation. After planting, try rotary hoeing, cultivating or flaming weeds with heat to control weeds.
- Pull, clip and remove weeds when the crops cannot be cultivated. If necessary, hire labor. Since weeds are prolific seed producers, removing these larger weeds can have a positive impact on the weed seed bank in the soil.

This fact sheet has covered the very basics of organic weed control. Below are some excellent references that can be of further assistance.

Recommended resources

1. "Flaming as a Method of Weed Control in Organic Farming Systems." MSU Extension bulletin E-3038. Mutch, D., S.A. Thalmann, T.E. Martin and D.G. Baas. 2008. E. Lansing, Mich. http://web2.msue.msu.edu/bulletins/Bulletins/PDF/E3038.pdf.
2. "Integrated Weed Management: 'One Year's Seeding…'" MSU Extension bulletin E-2931. Davis, A., K. Renner, C. Sprague, L. Dyer and D. Mutch. 2005. E. Lansing, Mich. Michigan State University. http://web2.msue.msu.edu/bulletins/.
3. "Integrated Weed Management: Fine Tuning the System." MSU Extension bulletin E-3065. Taylor, E., K. Renner, and C. Sprague. 2008. E. Lansing, Mich. Michigan State University. http://web2.msue.msu.edu/bulletins/.
4. "Organic Field Crop Handbook." Second edition. Canadian Organic Growers, Box 6408, Station J, Ottawa, Ontario K2A 3Y6. www.cog.ca.
5. Attra. "Field Crops." attra.ncat.org. 800-346-9140.
6. "Organic Weed Control: Cultural and Mechanical Methods." Howell, M. and K. Martens. Acres. August 2002, Vol. 32, No. 8. www.acresusa.com. 800-355-5313.
7. "Organic Weed Management. Organic Field Crop Production and Marketing." Burton, M., R. Weisz, A. York and M. Hamilton. North Carolina State University. www. organicgrains.ncsu.edu/pestmanagement/weedmanagement.htm.
8. "Weed Management in Organic Cropping Systems." Penn State University Extension. Agronomy Facts 64. htttp://cropsoil.psu.edu/extension/facts/agfacts64.cfm.
9. SARE. www.sare.org/publications/all pubs.htm
   a. "Steel in the Field: A Farmer's Guide to Weed Management Tools."
   b. "Managing Cover Crops Profitably," 3rd edition.
   c. "Building Soils for Better Crops," 2nd edition.
10. MOSES. www.mosesorganic.org.

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