

Sustainable Agriculture

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New herbicide-resistant crops must also be friendly to the environment

"These are exciting times for weed management technology," says University of Minnesota weed scientist Orvin Burnside. He's talking about genetically altering crop plants to protect the crops from herbicide damage while improving weed control.

The technology is called HRC, for herbicide-resistant crops, and it's controversial. HRC has been called an environmental assault. Some environmentalists are concerned about the extent of herbicide use and now they believe HRC will further entrench and extend the pesticide era.

"We need to take an objective look at HRC and weigh all potential risks against the benefits," Burnside says. He's done just that in the final chapter of a new book, *Herbicide-Resistant Crops*, recently published by Lewis Publishers.

Herbicide-resistant crops are not anti-environmental, Burnside says. "In fact, HRC could enable producers to use less herbicide. And it should help reduce use of those herbicides that are showing up as persistent in the environment."

The HRC technology can be used properly, but it can also be misused and misunderstood, Burnside says. "When you consider the pros and cons of HRC, it's obvious that HRC can contribute to the productivity and profitability of agriculture if used wisely in a sound, integrated weed management program."

Development of HRC should be limited to environmentally benign herbicides, he says, and to crop production situations where they can reduce crop injury, improve weed management, increase crop yields or quality, and favorably or at least not adversely affect the environment.

"It's the responsibility of the Animal and Plant Inspection Service (APHIS) to evaluate the risks and benefits of each HRC and approve their use on a case-by-case basis, rather than issuing a blanket authorization or condemnation of the technology."

HRC technology is coming--and coming fast. Between 1987 and 1993, the U.S. Department of Agriculture issued 347 permits for field tests on genetically modified plants. And 118, or just under one-third, were for herbicide-resistant crops. Burnside says scientists in at least 18 companies are developing HRC.

For more information, including a copy of his complete article on herbicide-resistant crops, contact Burnside at 411 Borlaug Hall, University of Minnesota, St. Paul, MN 55108. Tel. (612) 625-9763.

Agriculture a major contributor to poor water quality, EPA says

Nearly 40 percent of U.S. water bodies surveyed in 1994 remain too polluted for fishing, swimming and other uses. And agriculture is one of the five major sources of that pollution, according to a new report by the Environmental Protection Agency (EPA). The survey represents 17 percent of the nation's rivers, 42 percent of its lakes, and 78 percent of its bays and estuaries.

National Water Quality Inventory: 1994 Report to Congress, released in December 1995, is the result of a biennial assessment of the nation's waterways. Findings include:

- Causes of water pollution: The five leading causes of fair to poor water quality include excess nutrients, especially nitrogen and phosphorus compounds from fertilizers, manure and detergents; and sediment and siltation, or the suspension and deposition of small sediment particles in water bodies, usually from eroding land, plowed fields and other sites.
- Sources of water pollution: Agriculture is one of the five leading sources of fair to poor water quality in rivers, streams, lakes, ponds, reservoirs and estuaries.
- Rivers and streams: Agriculture generates pollutants that degrade aquatic life or interfere with public use of 134,000 river miles, or 60 percent of river miles with fair to poor water quality. It's the leading cause of pollution in those river miles. The 49 states and tribes that reported on their rivers and streams said that nonirrigated crop production impaired the most river miles, followed by irrigated crop production, rangeland, feedlots, pastureland and animal holding areas. Overall, 64 percent of the rivers and streams surveyed had good water quality, and 36 percent had fair to poor water quality.
- Lakes, ponds and reservoirs: Agriculture generates pollutants that degrade aquatic life or interfere with public use of 3.3 million lake acres, or 50 percent of the lake acres with fair to poor water quality. It's the leading source of pollution in those lake acres; nutrients are the leading pollutant.
- Great Lakes: Agriculture is the sixth leading source of pollution in Great Lakes Shoreline miles with fair to poor water quality. The Great Lakes states reported the leading causes of fair to poor water quality include pesticides, affecting 21 percent of polluted shoreline miles; nonpriority organic chemicals, affecting 20 percent; and nutrients, affecting six percent. Overall, three percent of the Great Lakes Shoreline miles surveyed had good water quality; 97 percent had fair to poor water quality.
- Wetlands: Agriculture is the leading source of degraded wetlands, according to 13 reporting states. Sediment was the most widespread cause; others included pesticides and nutrients.
- Groundwater: Among sources of groundwater contamination most frequently reported by states were agricultural activities. The most common contaminants included nitrates, pesticides and petroleum compounds.

Copies of the National Water Quality Inventory are available from EPA's Water Resource Center at (202) 260-7786.--from Alternative Agriculture News

Precision agriculture is changing farming

Precision farming uses sophisticated equipment involving satellites and computer data. But you can work into precision agriculture gradually, and you don't need to buy new equipment, says Mark Seeley, climatologist with the University of Minnesota's Extension Service.

Seeley says precision agriculture is a combination of high technology and traditional agriculture. It's a mix of technology, information and applied scientific practices. Precision agriculture helps make more efficient use of farm inputs, reduces environmental risks and helps produce consistently good to excellent yields.

Seeley says precision agriculture techniques are being demonstrated at a number of Minnesota locations. More information is available from a new "Precision Agriculture" video. It's available from the Minnesota Extension Service for \$35 plus sales tax and shipping charges. You can order a copy by calling the Distribution Center at (612) 625-8173 or 1-800-876-8636. Call Pierre Robert (612) 625-3125 for general information about sustainable agriculture.

Publications from ATTRA

Integrated Pest Management (IPM) Information Package, 1995, by Rex Dufour and Chris Rugen. Describes key components and pest control tools of IPM systems and examines economic, social and environmental factors influencing IPM. Emphasizes IPM as compatible with sustainable agriculture because it depends on healthy soils and managed crop diversity, and because it requires agroecological knowledge to implement. Includes brief resource directory of books, organizations and on-line databases related to IPM. 21 pp. No charge (in U.S. only). Appropriate Technology Transfer for Rural Areas (ATTRA), P.O. Box 3657, Fayetteville, AR 72702; phone (800) 346-9140; e-mail askattra@ncatfyv.uark.edu.

Organic Tomato Production, 1995. Steve Diver, Lane Greer and George Kuepper. Guide to U.S. organic tomato production, including recommended ecological controls for major insect pests, diseases and other significant tomato problems. Describes cultural and mechanical practices used by organic tomato producers and lists resources for further investigation. 33 pp. No charge (in U.S. only). ATTRA (see above paragraph).

Nitrogen-fixing legumes becoming more attractive, says The Furrow

Whether they're grown as companion crops or rotation crops, "nitrogen-fixing legumes are becoming more attractive to profit-conscious farmers," according to an article in *The Furrow* (Dec. 1995) "Major efforts to better utilize this valuable trait are a fairly recent development," the article says. It describes work of researchers and farmers in Iowa, Maryland, Pennsylvania and Illinois who have planted hairy vetch, berseem clover, red clover, birdsfoot trefoil, white lupin, medics and soybeans.

Book, tape from Future Harvest author available

Limited copies of *Future Harvest*, by Nebraska farmer Jim Bender, are available from the Minnesota Extension Service. Also available for loan is a video tape based on an in-depth interview with Bender, who operates a 600-acre farm without synthetic pesticides or chemical fertilizers. He integrates crop and livestock production and has a highly diversified system that adds value to products and commodities.

Contact Don Olson at 146 COB, University of Minnesota, St. Paul, MN 55108, (612) 625-9292. E-mail: dolson@extension.umn.edu

Proceedings from decision case workshop available

"Teaching and Learning with Cases: Promoting Active Learning in Agriculture, Food and Natural Resource Education" was the title of a 1995 national workshop. Proceedings of the decision case workshop are available for \$14 from the Michigan State University Bulletin Office, 10-B Agriculture Hall, E. Lansing, MI 48824-1039, fax (517) 353-7168.

Here are some 1996 meetings...

Swedish farmers and researchers will be featured Feb. 17. The Sustainable Farming Association of Western Minnesota (and other sponsors) will present a program on practical approaches to hog production on crops and diversified farms. It's from 10 a.m. to 3 p.m. at the KMS High School in Kerkhoven, Minn. Presenters include Bo Algers and Barbro Mattson from the University of Agricultural Sciences in Skara, Sweden. Algers is an expert on swine behavior and its implications for practical design of welfare-compatible housing systems. Mattson is an expert on deep straw bedding economy and performance on Swedish farms. Pre-registration is \$10 before Feb. 14, or \$15 at the door. Send registrations to LeeAnn VanDerPol, 4075 110th Ave. NE, Kerkhoven, MN 56252. Phone (612) 847-3432.

The Sustainable Farming Association of Minnesota's Annual Meeting is Feb. 22-24 in Duluth. Early bird registration (by Feb. 15) is \$20, with \$12 for additional family members. The keynoter is Laura Freeman, president of her \$20 million marketing operation, Laura's Beef. Lots of other good speakers and workshops are scheduled. Contact Tim King, SFA, Rt. 2, Maple Hill, Long Prairie, MN 56347, (612) 732-6203, or Jennifer Buckley (218) 727-1414.

Also Feb. 22-24 is the North American Farmers' Direct Marketing Conference in Saratoga Springs, N.Y. Contact Charlie Touchette at (413) 527-6572.

The Pacific Northwest Farm Direct Marketing Association Trade Show is Feb. 29-March 2 in Eugene, OR. Contact the FDMA Trade Show at (503) 373-9650.

The 7th Annual Upper Midwest Organic Conference is March 1-2 at Sinsinawa Mound in southwest Wisconsin. Speakers include Fred Kirschenmann, organic farmer from North Dakota, and Marty Strange, director of the Center for Rural Affairs and author of *Family Farming: A New Economic Vision*. There will be over 60 workshops with experienced growers and consultants. Registration is \$65. For a conference flyer, contact Prescott Bergh at the Energy and Sustainable Agriculture Program, Minnesota Department of Agriculture, 90 W. Plato Blvd., St. Paul, MN 55107. Call (612) 215-0367 or (612) 296-7673. E-mail pbergh@mda-is.mda.state.mn.us

A farming systems conference is set for March 8 in Calmar, Iowa. Scheduled for the Northeast Iowa Community College in Calmar, it will feature success stories on enterprises for family farm agriculture and teamwork approaches for non-farmer agriculture professionals. It's designed for producers and agricultural professionals in the tri-state area. Contact Rick Exner, 2104 Agronomy Hall, ISU, Ames, IA 50011, (515) 294-1923.

We can use your story ideas

Keep the story ideas coming. Send them to the editor: Jack Sperbeck, 405 Coffey Hall, University of Minnesota, St. Paul, MN 55108, (612) 625-1794. E-mail: jsperbeck@extension.umn.edu. Other editorial board members are Helene Murray (612) 625-0220, Don Olson (612) 625-9292 and Bill Wilcke (612) 625-8205.

Our mission statement: To help bring people together to influence the future of agriculture and rural communities to achieve socially, environmentally and economically sustainable farms and communities.