

# Sustainable Agriculture

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## Researcher uses natural controls to save honey bees from threatening mites

Bees are being killed in record numbers by lethal mites, but a natural control that uses the bees themselves as a pesticide alternative offers a solution. The Varroa mite has killed off about 50 percent of managed bees in Minnesota during the last decade, says Marla Spivak, entomologist with the University of Minnesota Extension Service.

Spivak is using "hygienic" bees as a natural control. They have an unexplained ability to naturally detect the mites on immature bees (brood) and throw the infested brood out of the colony. Hygienic bees not only control mites, but are resistant to dangerous bacterial and fungal disease in immature bees.

"Sometimes we can breed honey production out when selecting for other traits," Spivak says, but honey production has remained high with her hygienic bees. Although only about 10 percent of U.S. honeybees are hygienic, Spivak is giving breeder stock to commercial beekeepers for a two-year period. She's also developed simple screening procedures so they can select for hygienic bees. Bee breeders need only two or three seasons to develop hygienic bees that are effective against mites.

The ultimate goal is to reduce the amount of pesticide used by beekeepers. This will lower operating costs and eliminate the risk of contaminating the honey. It will also avoid the danger of mites developing resistance to the pesticide, which is already happening in Florida. "This is a solid, sustainable approach," says Spivak, "instead of the short-term pesticide approach that can carry long-term, negative consequences."

Spivak says genetic diversity in bees, now low due to widespread mite kill-off, can be maintained if many bee breeders select for hygienic bees. Her research is funded by a grant from USDA's North Central Sustainable Agriculture Research and Education program. She can be reached at (612) 624-4798, [spiva001@tc.umn.edu](mailto:spiva001@tc.umn.edu).

## New publication on whole farm planning

Farm families can use whole farm planning to address concerns about their farms. And a new publication, *Whole Farm Planning: Combining Family, Profit, and Environment*, can help. It's available from the University of Minnesota Extension Service.

Whole farm planning is a process to help farm families balance quality of life with the farm's resources, the need for production and profitability, and long-term stewardship. This 30-page publication introduces whole farm planning and describes how to get started.

The publication lays out the four steps of the whole farm planning process and describes nine planning tools most frequently used in Minnesota (including PLANETOR, Holistic Management, and

Farm\*A\*Syst). It compares their strengths and weaknesses and describes how the tools can be used in combination to meet all aspects of the whole farm planning process.

Four farm profiles help show how farm families have used the planning tools. The publication also includes contact information for the planning tools and a list of other helpful planning resources.

The publication is part of a new series of informational materials developed through the Sustainable Agriculture Information Exchange, by the Minnesota Institute for Sustainable Agriculture (MISA). It's available from county offices of the University of Minnesota Extension Service, or from its Distribution Center. Single copies are \$2.50 plus sales tax and shipping charges. For more information and prices on bulk orders, call 1-800-876-8636, or 624-4900 in the Twin Cities.

### **New Decision Tool for pesticide selection and management**

A new Decision Tool that rates the chances that a pesticide may contaminate ground and surface water is available from the Institute for Agriculture and Trade Policy (IATP) in Minneapolis. The central component of the Decision Tool is the USDA Natural Resource Conservation Service's Windows Pesticide Screening Tool (WinPST).

For each soil type and pesticide active ingredient, there are three possible rating classes: high, intermediate, and low. These qualitative categories measure the likelihood that a pesticide will leave the application site via runoff or move down through the soil below the root zone. Types of contamination considered are groundwater contamination via leaching, and surface water contamination from dissolved pesticides and pesticides absorbed to soil particles.

Printed materials, including reference tables for corn and soybeans, are available. They're designed for both farmers and those who provide them with technical advice. Crop consultants may find the Decision Tool a practical way to enhance the environmental component of client services, says John Vickery of IATP. WinPST software can be downloaded via File Transfer Protocol from an NRCS web site. More information is available from Vickery at (612) 870-3430, [jvickery@iatp.org](mailto:jvickery@iatp.org). For information about IATP and its [Environment and Agriculture Program](#).

### **Researchers explore ways to increase genetic diversity in bison**

Scientists in South Dakota are exploring ways to increase genetic diversity in bison, a species recovering from near extinction. They're also working on increasing profits and improving slaughtering techniques. The Tribal College scientists are developing solutions from a American Indian perspective.

Buffalo are an important part of Indian heritage and culture, and buffalo restoration is a key issue for many American Indian communities. The Buffalo Restoration Project is developing culturally relevant slaughtering techniques--a stainless steel, self-contained, and mobile system has been developed for on-site slaughter.

Sponsors include the [Visions for Change Project](#), College of Agricultural, Food, and Environmental Sciences, University of Minnesota. For more information, contact Denise Gamble at (612) 625-7062, [gambled@tc.umn.edu](mailto:gambled@tc.umn.edu).

## **Feeding beef for organic market requires good planning, higher price**

A recent University of Minnesota study by animal scientists Maribel Fernandez and Brent Woodward compared conventional and organic beef production systems. Twenty-four steers from conventional and 30 from low-input farming systems were randomly divided into two groups and assigned to either organic or conventional feedlot systems, resulting in four treatment groups.

Steers in the conventional group were dewormed, implanted, fed ionophore, and treated with antibiotics as soon as necessary. They had higher rates of gain, better feed efficiency, and required fewer days on feed. Total cost of gain was 39 percent higher for steers finished organically.

The study also showed diatomaceous earth (DE) had no effect on internal parasites or overall performance (many sustainable and organic livestock producers use DE for parasite control). There were no detectable pesticide residue levels in feedstuffs; drinking water; and muscle, liver, or kidney tissue from any group. "There were no surprise findings," Woodward says, "but we did give producers interested in organic beef production some ideas of what they can expect."

The definition of "organic" in the study was based on 1994 recommendations of the U.S. National Organic Standards Board; and organic feedstuffs were certified by an organic foods association to have been raised without any synthetic compounds. "Organic standards were followed, but we chose not to go to the expense of getting our research facility certified," Woodward says. "Low input" means reduced inputs compared to conventional management, and may fall outside organic standards in some cases.

Producers considering organic beef production must be prepared for differences in time to develop cattle to desired weights, and potentially lower retail product yield. Both could have significant impacts on profitability, Woodward says. Genetic composition of steers will also affect the final product. "Producers need to analyze the genetic composition of their herd and its effect on final product to determine what beef production system is best for them," he says.

The project was financed by the Agricultural Experiment Station and the Graduate School; University of Minnesota; a gift from Mrs. Janice Haarstick Dayton; and sales of beef from the project, which raised over \$60,000. More information is available in the Minnesota Beef Cow/Calf Report, available for \$6 from the Department of Animal Science, 122 Peters Hall, University of Minnesota, St. Paul, MN 55108. Woodward can be contacted at (612) 624-3667, e-mail [brent@cowboy.agoff.umn.edu](mailto:brent@cowboy.agoff.umn.edu).

## **You can have fun, learn about farming while playing the AgLand Game**

The players can learn about farming, natural systems, and public finance--and have lots of fun doing it. *AgLand: The Game*, is designed for high school, college, and adult learning settings. It's an interactive adventure that helps players deal with complex issues and think about consequences of their choices, says Steve Taff, economist with the University of Minnesota Extension Service.

"This is not a 'human against the computer' teaching tool," Taff says. The computer is a teacher's aide--players learn by interacting with each other, not by staring at a terminal. "To play AgLand, you don't have to know much about agriculture, economics, or wildlife in advance," Taff says "The basic science information for the players come with the game. All you need are a few hours, a willing group of players, and an open mind," Taff says. He can be reached at (612) 625-3103.

AgLand is available for \$150 plus sales tax and shipping. To order, contact the University of Minnesota Extension Service Distribution Center at 1-800-876-8636, or 624-4900 in the Twin Cities. You can also order directly from the [web site](#).

### **Calendar of 1998 events.**

July 9, Field Day, West Central Experiment Station, Morris, (320) 589-1711

July 9, 7 p.m., Spring Valley. Low Input Conversion of CRP Land to a High Profitability Management Intensive Grazing-Haying System. Contact: Dan & Cara Miller, (507) 346-2261

July 17, 8 a.m., La Crescent. Development of Mating Disruption and Mass Trapping Strategy for Apple Leafminer Control in Commercial Orchards, \$10 fee. Contact: Leidel's Orchards, Bernie & Rosanne Buehler, (507) 895-4832

July 19, 12:30 p.m., Carlton. Picnic of Local Meats, Tour of Beef Cattle Farm and Bison Ranch. Contact: Lake Superior Meats Cooperative, (218) 727-1414

July 21, 11 a.m., Rushford. A Comparison of Frost Seeding to Impaction Seeding Using Sheep on CRP and Wooded Hillsides. Contact: James Scaife, (507) 864-2896

July 21, South Central Technical College, North Mankato. Land Stewardship Opportunities for Women. Contact Billeye Rabbe, (507) 235-3341

July 21, 1 p.m. to 4 p.m., Park Rapids. Field Day and Whole Farm Planning Workshop. Contact: Dewane Morgan, (218) 732-4866

July 21-23, Itasca State Park. Sustainable Farming Association of Minnesota's Summer Retreat. There is a fee. Contact: DeEtta Bilek, (218) 445-5475

July 28, 11 a.m. to 2 p.m., Red Wing. Evaluating Kura Clover, Birdsfoot Trefoil, and Grazing Alfalfa for Long-Term Forage Persistence. Contact: Jon Luhman, (612) 388-6789

Aug. 6, 6 p.m. (rain date Aug. 13) Vegetable Garden tour at Camphill Village. Contact: Steve Potter, (320) 732-2336

Aug. 9, 12:30 p.m. Two Harbors. Lunch, Tour of Small Diversified Vegetable Operation and Orchard. RSVP, (218) 834-5221

Aug. 15, 10 a.m. (repeated at 1 p.m.), tour showing rotational grazing and environmental monitoring, Big Woods dairy farm in Nerstrand Big Woods State Park near Faribault. Call (507) 334-8848 for reservations

Aug. 22, 1 p.m. to 3 p.m., Buckwheat Field Day, Aldrich. Contact: Tom Bilek, (218) 445-5475

Sept. 3, Beef/Forage Field Day, North Central Experiment Station, Grand Rapids, (218) 327-4490

Sept. 9, Fall Field Day, Southwest Experiment Station, Lamberton, (507) 752-7372

Sept. 10, Corn & Soybean Day, Southern Experiment Station, Waseca, (507) 835-3620

Sept. 12, 9 a.m. to 4 p.m., 5th Annual Bayfront Harvest Festival, Duluth. Hosted by the SFA of Northeast Minnesota, (218) 727-1414

Sept. 19, Grazing/Sheep Day, West Central Experiment Station, Morris, (320) 589-1711

### **About this newsletter...**

For the past year we've been funded by the Minnesota Extension Service and the Minnesota Institute for Sustainable Agriculture (MISA) with support from the Minnesota Department of Agriculture.

We're always looking for story ideas. 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](mailto:jsperbeck@extension.umn.edu). Other editorial board members: Helene Murray (612) 625-0220, [murra@021.tc.umn.edu](mailto:murra@021.tc.umn.edu); Tom Wegner (612) 374-8400, [twegner@extension.umn.edu](mailto:twegner@extension.umn.edu); and Bill Wilcke (612) 625-8205, [wwilcke@extension.umn.edu](mailto:wwilcke@extension.umn.edu)

**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.