The IPM Report

MSU Integrated Pest Management Program

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Welcome to our fall report

In this issue, we give special attention to IPM-related work of some of our MSU colleagues. IPM Program staff appreciates the invitation to participate in these programs, and we are proud to add value to projects initiated by our partners. Thanks to MSU departments, Michigan Agricultural Experiment Station and Michigan State University Extension for the encouragement to build these teams. – *Michael Brewer, IPM Coordinator.* ♦

Coordinator's update

Weather-based IPM showcase

Periodically, we invite our industry, agency and university colleagues to join us to discuss IPM activities. This fall, a one-day conference was held on October 17 to discuss the development of a weather-based integrated pest and crop management system to aid Michigan agricultural and green industries with production decisions. The key conference topics were technology for weather data collection and transmission, uses of weather-based pest and crop management products, and delivery of information and products to end users. Over 60 producers, consultants, researchers and field educators along with 12 representatives from ag and green industries came together to learn about current systems and latest developments, as well as help plan for the future. Needs, priorities and strategies gathered from the conference are being summarized by the organizing committee and will be presented to conference attendees and our Project GREEEN sponsor. Recommendations from the conference will be presented to Project GREEEN leadership. I'd like to thank those who worked on the organizing committee with me: Nikki Rothwell, Bill Shane, Annemiek Schilder, Ed Grafius, Ron Calhoun, Ron Goldy, Bruce MacKellar, Willie Kirk and Jeff Andersen.

Financial incentives for IPM through conservation programs

It's the time of year when growers consider applying to USDA conservation programs as a means to implement IPM to address resource concerns and enhance farm stewardship. We greatly appreciate the recognition of IPM as a valuable resource conservation tool that qualifies for support in the USDA NRCS Conservation Security Program (CSP) and the Environmental Quality Incentives Program (EQIP). CSP assists growers already using conservation practices with the expense of their continued use and provides additional financial incentives to increase conservation efforts. This includes maintaining ongoing IPM efforts and implementing new ones. For the 2006 program year, CSP will be available for farms in the Maple River watershed and the Boardman/ Charlevoix River watershed. These watersheds include portions of Antrim, Charlevoix, Cheboygan, Grand Traverse, Leelanau, Otsego, Clinton, Gratiot, *Continued on page 3.*

For more information about conservation programs and IPM, visit: http://www.ipm.msu.edu/farmbill.htm.

Our mission: The MSU IPM Program promotes the use of integrated pest management (IPM) and affiliated management tools to safeguard farm and environmental health through research-based education, service, and demonstration and applied research.

MSU awarded two USDA grants for organic research, education and extension

Two grants were received by Michigan State University and its partners from the USDA Organic Initiative this fall. The focus of our "Partnering to Cultivate Organic Agriculture in Michigan and the Midwest" grant will be on integrating research, marketing, outreach and education to address issues of top priority to Michigan organic producers – both current and transitioning farmers. Top priorities will be decided with farmers, but we are anticipating a focus on understanding of processes that allow prediction and biological management of nutrients and insects in field crop and vegetable systems. The variability of the weather over the growing season and the undeveloped nature of organic marketing are important challenges in the Upper Midwest and will be addressed within this multidisciplinary effort. Other initiatives in the region are addressing weed management, so our focus will be primarily on soils and arthopods, although we realize that these will interact with other components of cropping system management. Total funding for this project is $754,442.

Key responsibilities are outlined below, so that those interested in collaborating can contact the appropriate individual:

- Sieglinde Snapp (Horticulture) lead investigator, group coordinator and soil/nutrient management
- Dale Mutch (IPM Program and Kellogg Biological Station) field crop activities and the New Ag Network outreach
- Joy Landis (IPM Program) New Ag Network outreach
- Mathieu Ngouajio (Horticulture) vegetables activities
- Jim Bingen (Community, Agriculture, Recreation and Resource Studies) marketing
- David Conner (Community, Agriculture, Recreation and Resource Studies) marketing
- Mike Brewer (IPM Program) insect management
- Ed Grafius (Entomology) insect management

Dale Mutch leads a group during a field day at the Kellogg Biological Station. The plot they are observing will be a part of the organic studies done with the grants received.

- George Bird (Entomology) nematodes
- John Biernbaum (Horticulture) organic undergraduate curriculum.

As we learn together, we will be actively engaged with farmers through the New Ag Network, on-farm research activities and farmer visits. Experiential learning and findings from our community of practice will form the basis for the organic curriculum, providing direct support for future organic farmers.

USDA funds organic research for soybean rust management

The USDA's Integrated Organic Program has awarded Iowa State University, Michigan State University, University of Florida and the Rodale Institute $480,000 to evaluate strategies for management of soybean rust in organic systems. The long-term goal of this project is to identify and test best management practices for control of Asian soybean rust (*Phakopsora pachyrihizi*) in organic production. Though soybean rust, which arrived in the United States in 2004, has not been found in the major soybean production areas this year, it has the potential to be the single most important impediment to organic soybean production in the United States. The loss estimates of soybean rust in organic systems range from $30 million to $120 million.

Strategies for soybean rust to be evaluated will include extended crop rotations and windbreaks (to mitigate spore dispersal), NOP-compliant fungicides, such as copper sulfate and hydrogen peroxide and biological controls (*Bacillus pumilus*) and other microbial products. This multi-institutional, farmer-based project will include on-station studies and on-farm surveys. Disease incidence, spread, soybean yields and seed quality will be monitored.

Evaluating this effort, including economic analysis of the production cost of soybean rust management techniques, will be conducted with farmer-cooperators. The project will create a means to monitor organic soybeans at strategic locations across the nation and provide best management practices for controlling the disease in organic systems.

Contact information for soybean rust project: Jerry DeWitt, Iowa State University (515-294-7836); Dale Mutch (mutch@msu.edu), George Bird and Mark Whalon, Michigan State University.– *Dale Mutch, IPM Program/KBS.* ♦

Advancing new approaches to manage an old pest in Michigan apple production

Everywhere apples are grown codling moth presents growers with the challenge of producing worm-free apples. Female moths lay eggs on or near fruit. The larvae hatch from the eggs and tunnel into apples, resulting in unmarketable fruit. Preventing this type of damage is an annual battle for apple producers worldwide.

Unfortunately, reduced pack-outs and increased load rejections at the packing house and processor due to wormy fruit have become all too common for many Michigan growers as traditional management programs based on applications of organophosphorous insecticides fail to control this pest. Part of the problem is that codling moths have developed high levels of resistance to azinphosmethyl, a commonly used organophosphorous insecticide, in most production regions. Bioassays conducted by MSU researchers over the past three years show that codling moth resistance to these insecticides is a statewide concern.

Continued on page 4.

Below are two of several types of pheromone dispensers being used by growers in the area-wide codling moth management project.

Coordinator's report *continued from page 1*

Ionia, Montcalm and Shiawassee counties. Meetings are being planned to assist producers with applying for CSP. For more information, go to www.mi.nrcs.usda.gov/programs/csp.html or contact your local NRCS office.

We are seeing good momentum from our activities with the second conservation program, EQIP. This program is designed to assist growers with the expense of initiating conservation practices like IPM to address important farm resource conservation concerns such as groundwater and surface water protection, and air quality. MSU has been working with industry and agency partners to increase EQIP participation in five pilot counties (Oceana, Grand Traverse, Leelanau, Antrim and Ottawa). For 2005, 64 EQIP applications were approved. Those contracts total about $3.04 million with about 15 percent of the funds supporting IPM implementation. Extension and NRCS personnel are reporting that counties neighboring our pilot efforts are experiencing increased grower interest including more applications with an IPM component. One neighboring county reports 17 applications approved for $496,000 that include IPM activities compared to none in previous years. Statewide, there has been about a five-fold increase in EQIP dollars sponsoring grower use of IPM.

Here are some of the IPM tactics that Michigan farmers are including in their 2005 applications:

- Converting to reduced risk technologies such as adding electronic canopy sensing technologies to orchard sprayers, using flamer and steamer weed control technology, and applying pesticides with low potential for ground and surface water contamination.
- Removing wild host plants that harbor pests.
- Mulching legume hay in young plantings to improve plant health and reduce use of herbicides with high leaching potential.
- Establishing sod centers in orchards with a legume and grass blend to provide plant nutrients, reduce erosion and provide alternate hosts for beneficial insects.

IPM information related to EQIP can be found at our web site, www.ipm.msu.edu/farmbill.htm.

Grant and program activity highlights

Organic research in field crops and vegetables, soybean aphid regional management, and IPM education for Christmas trees and landscapes are some of this year's IPM-related grants in which we are involved. See separate articles for details on these and other projects.

Staff transition

This spring, Diane Brown-Rytlewski completed her work as nursery and landscape IPM integrator. We are looking forward to continued interaction with her in her new position at MSU as field crops specialist within the Plant Pathology Department. – *Michael Brewer, IPM Coordinator.* ♦

Moths from some of the most resistant strains were trapped in orchards in the Fruit Ridge area north of Grand Rapids. This is the region where an ambitious new area-wide approach to codling moth management got underway in 2004. The area-wide approach involves growers with adjacent farms cooperating to deploy strategies aimed at driving down codling moth populations on all of the contiguous apple acreage located within a designated area. In many fruit production regions, area-wide management programs based on mating disruption have been successful in controlling various moth pests. California, Oregon and Washington pioneered this approach for controlling codling moth in pome fruit orchards, and South Africa and Australia have successfully implemented programs targeting Oriental fruit moth in pome and stone fruit orchards. The backbone of area-wide management programs everywhere is the deployment of pheromone mating disruption.

Pheromone-based disruption is one of the most promising practices for managing codling moth. It works by turning the insect's own communication system against itself. Codling moths rely on chemical signals produced by adult females, called pheromones, to find male partners for mating. By distributing synthetically produced pheromones throughout the orchard, a grower interferes with male moths' ability to find and mate with females, thereby reducing the number of viable eggs and ultimately the number of worms in fruit.

Researchers working with growers to implement pheromone disruption as a control tool have recognized that this control strategy works best where it is deployed over large, contiguous plantings, rather than in small plots surrounded by other orchards. This approach makes it more difficult for male moths to move to pheromone-free air and locate mates, and it minimizes mated females movement from orchards not treated with pheromone into the

treated blocks. An area-wide approach promotes cooperation by growers and has proved to be one of the best means of tackling a pest that is omnipresent and problematic year in and year out.

The 2004 Michigan Codling Moth Area-Wide Management Program comprised approximately 800 contiguous acres. In 2005, additional funding was obtained, and the project expanded to 20 growers on over 2,300 acres, representing a nearly three-fold increase. Growers apply mating disruption products prior to first adult emergence in spring. The area-wide project also entails incorporating other new controls for codling moth into the growers' IPM program; most notably codling moth granulosis virus and EPA designated "reduced risk" selective insecticides.

Codling moth populations in the selected region have been significantly lower in all project blocks in 2005 as compared to 2004. Much higher moth captures were recorded in blocks outside the project that were not treated with pheromone, but monitored for comparison. Pre-harvest fruit injury in 2004 averaged 43 percent less in the area-wide orchards compared to orchards outside of the program with no orchard sustaining injury greater than 1.5 percent. Pre-harvest evaluations for 2005 are on-going.

The program's legacy goal is that growers will recognize the benefit of working cooperatively to manage codling moth and that mating disruption deployed on a regional basis is a core tactic for controlling this pest well into the future. Control tactics such as mating disruption and the newer pesticides "fast-tracked" through EPA registration to replace materials restricted by the 1996 Food Quality Protection Act, require far more knowledge of pest biology and phenology to be used effectively and economically. Demonstration projects, such as this area-wide management program, facilitate adoption and help to speed up the learning process. This program's success could lead to more cooperative pest management such as area-wide control of obliquebanded leafroller and Oriental fruit moth. Several newly developed mating disruption dispensers target more than one species at a time by combining different pheromones into one product.

This project is working towards maintaining fruit farming as a strong component of Michigan's economic base and in protecting the state's environmental quality. Surrounded by the Great Lakes and with over 100,000 acres of orchards, Michigan is uniquely situated as the leading producer of fruits in the Midwest with a profound impact on the State's environmental quality and economic vitality, not only in direct farm gate and food processing revenues, but in the role that open orchard land plays in tourism appeal. *– David Epstein, IPM Program.* ♦

Area-wide codling moth management project

Funding support provided by Gerber Products Company, Pacific Biocontrol Corporation, the USDA, the EPA, American Farmland Trust and Michigan State University.

For more information, contact:

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- Peter McGhee 517-432-9514 mcghee@msu.edu

New scouting guides will help with pest identification in Christmas trees, nurseries and landscapes

The nursery and landscape industry in Michigan, which collectively generates $3.67 billion annually and employs 347,000 workers, is made up of diverse segments, including nursery production, landscape management contractors, landscape design and build firms, and retail garden centers. Greenhouse and Christmas tree gross sales also contribute about $200 million and over 150,000 additional jobs to the Michigan economy.

With the diversity of common weed species in Michigan, many growers are not able to recognize every problematic weed species, especially species new to their area. As a result, proper control methods are not selected and weeds are not controlled, leading to excessive herbicide use or crop losses due to weed competition. Importing propagules from many sources instead of growing plants from start to finish on site makes it more difficult for growers to track pest problems on their crops and may introduce pathogens, weeds and insects that the grower is not familiar with. There is also increasing awareness within the industry about pesticide risk and environmental impact and a push toward adopting ecologically sound control strategies for plant health problems.

Nursery, Christmas tree and greenhouse industries face a myriad of pest and plant health problems best managed within the context of a comprehensive IPM program. Scouting for pests is the foundation of an IPM program. Accurate identification of plant problems and weeds is crucial to successful implementation of IPM. Misdiagnosis or no diagnosis of problems may result in inappropriate or poor timing of management strategies and unsuccessful treatments. The Michigan Nursery and Landscape Association, the Michigan Christmas Tree Association, the Western Michigan Greenhouse Association and the Metropolitan Detroit Flower Growers Association all consider crop losses to pests as a serious detriment to their industries.

The increased reliance on reduced risk pesticides with narrower windows of effectiveness, more expensive products and greater pressure to use non-chemical means of control make the issue of correctly identifying plant health problems even more critical to successful management.

Previous pocket scouting guides have been widely adopted by Michigan growers with *A Pocket IPM Scouting Guide for Woody Landscape Plants* selling all 3,500 copies printed in the first year of release.

In addition, there is a need for affordable educational materials that can be utilized by Christmas tree growers, nurseries, greenhouses, state nursery inspectors, retail garden centers, landscapers, master gardeners and many others.

Most identification aids are too cumbersome to be carried by growers in the field. Our team has secured funding to produce three pocket-size scouting guides aimed to improve pest identification and IPM techniques in nurseries, landscapes and Christmas trees. The three guides to be developed are:

- Common weeds in Christmas trees
- Diseases and insects of herbaceous perennials
- Common weeds in nurseries and landscapes.

Failure to properly diagnose pest problems can result in large economic losses. Proper diagnosis will result in fewer crop losses, better quality plants, reduced regulatory and shipping problems and increased adoption of IPM practices. *– Steve Gower, MSU Diagnostic Services.* ♦

Scouting guide development team members

Jan Byrne, Diagnostic Services
Steven Gower, Diagnostic Services
Rob Richardson, Horticulture
Diane Brown-Rytlewski, Plant Pathology
David Smitley, Entomology
Raymond Cloyd, University of Illinois, Entomology
Willie Kirk, Plant Pathology
Bernard Zandstra, Horticulture
Michael Brewer, Joy Landis, Rebecca Lamb; IPM Program

Funding Partners: Project GREEEN and North Central Region IPM Implementation Grants Program

Other IPM scouting guides available from MSUE

IPM communications has partnered with MSUE specialists to produce pocket-sized scouting guides for blueberries, grapes, apples, stone fruit and woody landscape plants. The apple and stone fruit guides will be available in Spanish later this winter thanks to translations prepared by Anamaria Gomez-Rodas and Carlos Garcia-Salazar.

To purchase any of these guides, call the MSUE bulletin office at 517-353-6740 or order on-line at: www.emdc.msue.msu.edu

Soybean Aphid RAMP study winds down first season

The soybean aphid is now the most important pest impacting the United States' soybean yields. An estimated 50 percent to 90 percent of acres were treated per state in the Great Lakes region in 2005. A four-state project, "Soybean aphid in the Northcentral U.S.: Implementing IPM at the landscape scale" was funded in late 2004 by the USDA Risk Avoidance and Mitigation Program (RAMP). This project was introduced in the last IPM Report newsletter. Cooperators include entomologists, plant pathologists and economists from MSU as well as Iowa State University, University of Minnesota and University of Wisconsin. Here is a summary of some activities started this summer.

A key feature of this project is the use of standardized soybean aphid trials (called "IPM comparisons") in Iowa, Michigan and Minnesota. Each trial had replicated 1-acre plots assigned one of three treatments for soybean aphid.

1. Untreated – **No insecticide** and **no fungicide** for soybean rust (which did not reach the Midwest this summer).

2. The Best Management Practice (BMP) based on a consensus recommendation for soybean aphid control developed by Midwestern extension entomologists. The current BMP is to treat when aphid numbers reach **250 per plant** and populations are increasing. Fungicide was also not applied to these plots, as it was not justified.

3. A "prophylactic" grower standard selected by soybean producers. In the three states growers selected the same standard: an **insecticide/fungicide tank mix** applied at the R1 stage (initiation of flowering), regardless of aphid number or presence of rust.

Aphid populations were high enough in the three states that the BMP and prophylactic plots were treated. The plots will be harvested for yield in October.

The standardized trials served several purposes. They scaled-up typical soybean aphid research plots to a 1-acre size, providing a more realistic data set. Also, the trials not only replicated the same treatments at each location, but across the landscape in three states for a total of six unique sites representing different agro-ecosystems. The trials also allowed for grower input by including a grower-selected treatment. Finally, the IPM comparisons were used by others in the project to examine natural enemy communities across varied landscapes and to conduct economic analysis of IPM adoption – truly integrating the project across objectives.

One of the projects that uses the IPM comparison plots examines the impact of landscape complexity on the diversity and abundance of predators of soybean aphid. The hypothesis is that certain habitats harbor natural enemies, and the distance of these habitats from soybean may impact aphid control in the field. Mary Gardiner, an MSU graduate student, is coordinating this part of the study with the help of researchers in several states.

In each state, IPM comparison plots and additional commercial soybean fields were sampled weekly for predators using sticky traps, pitfall traps and direct observation. To assess landscape diversity, Mary obtained aerial photos of all sites. She will digitize the images, then quantify the proportion of the landscape in crop (for example corn, soybean) and non-crop habitat (for example woods, fallow field) in a 3.5 km circle from the middle of the sample location to relate surrounding habitat with predator and soybean aphid numbers in the field.

Changing a pitfall trap in the soybean aphid RAMP project field.

Meanwhile, Claudio Gratton from the University of Wisconsin – Madison is interested in soybean aphid movement across the landscape. Gratton's lab is attempting to develop "landscape" maps of aphid populations based on their stable isotope composition. This summer, cooperators collected samples throughout the range of soybean aphid in North America. These samples will be analyzed by Dr. Gratton for isotope composition to help us understand the possible sources and movement patterns of aphids at a regional scale.

Finally, pest management occurs in the context of economics, and the RAMP project is no exception. The economists involved in the project

Soybean aphid RAMP Project

Team members:
Michigan State University - Christina DiFonzo, Michael Brewer, Scott Swinton, Doug Landis, Mary Gardiner, and Takuji Noma.

University of Minnesota - David Ragsdale, Robert Venette, George Heimpel, and Kent Olson.

Iowa State University - Matthew O'Neal.

University of Wisconsin - Claudio Gratton, Craig Grau, and Tom German.

For more information, contact Christina DiFonzo, difonzo@msu.edu

are examining the cost, benefit, perception and adoption of production methods to control aphids in soybean production.

To collect baseline data before the field season, Dr. Kent Olson, Department of Applied Economics at the University of Minnesota, developed a brief questionnaire on aphid control in and awareness of current soybean ahid management recommendations. The questionnaire was given to producers and agribusiness representatives at Extension meetings in Iowa, Michigan and Minnesota in the winter of 2005. Dr. Olson is tabulating the results, which will be used to design a more detailed, random mail-in survey later in the project. – *Christina DiFonzo, Entomology.* ♦

Michigan's contribution to the national tracking effort for soybean rust

The summer of 2005 marked an unprecedented national effort between 30 soybean-producing states and the federal government to identify and track occurrence of soybean rust (*Phakopsora pachyrhizi*), a new and damaging crop disease that could reduce yields by as much as 80 percent. Michigan's 2.2 million acres of soybeans contribute $800 million to the state's economy, a significant asset to protect. Michigan State University and the Michigan Department of Agriculture (MDA) took the lead in bringing together commodity leaders, industry representatives, university scientists and government officials to address the threat. Thirty sentinel plots were established in the state, 20 by MSU Extension in cooperation with the North Central Plant Diagnostic Network and funded by the North Central Soybean Research Program, and 10 by the MDA in cooperation with USDA-APHIS (Animal and Plant Health Inspection Service). The 50 by 50 foot sentinel plots serve as early detection sites for rust infection so that growers can be alerted in time to protect their crops with fungicide.

Reid Frederick, USDA ARS
www.ipmimages.org

Advanced stage of soybean rust.

Asian soybean rust is a serious disease of soybeans in other parts of the world. It had not been found in the United States until November 2004, when rust spores blew into the country from Central America on the wind currents of a series of hurricanes. By mid-December 2004, rust infections were found in nine southern states. While the disease cannot overwinter on soybean refuse or soil, it is able to overwinter along the Gulf Coast and Florida on an alternate host, kudzu vine. The 2005 soybean growing season began with many questions. Had the disease overwintered in the United States? Would it spread north on wind currents, and if so, how far and how fast?

Twenty MSU soybean sentinel plots were distributed among 16 counties. From early June to harvest, plots were scouted weekly for soybean rust by county Extension personnel who submitted reports to MSU Diagnostic Services. Any soybean plants showing suspicious symptoms were sent by overnight courier to Diagnostic Services where the samples were immediately tested with a specific molecular procedure (real-time PCR) to identify the presence or absence of rust. No soybean rust

Soybean rust monitoring

Team members:
MSU Extension - Mike Staton, Dan Rajzer, Bruce MacKellar, Mike Metzger, Mike Score, Ned Birkey, George Silva, Phil Kaatz, Mark Seamon, Dave Pratt, Martin Nagelkirk.

MSU Plant Pathology - Ray Hammerschmidt, Jan Byrne, Jackie Smith, Sandy Perry.

Michigan Soybean Promotion Committee - Keith Reinholt

For more information, contact Ray Hammerschmidt, Plant Pathology Department chairman and NCPDN director, hammers1@msu.edu.

Soybean pest information on-line

Because soybean rust was a potential problem for Michigan soybean growers this year, the MSU IPM Program worked with Laura Probyn, MSU Extension, and Sara Long, Project GREEEN, to compile information on the disease for quick access on the Internet. The new web page has articles that were published in the *Crop Advisory Team (CAT) Alert* newsletters, as well as other Michigan resources.

Growers and consultants interested in what specialists and educators at Michigan State University would recommend for soybean rust control and prevention can view the information at: http://www.ipm.msu.edu/soybean/rust.htm

Another pest for Michigan soybean growers in the last few years is the soybean aphid. Because information on this insect also needs to be monitored closely, a companion page has been made. It features articles from the *Crop Advisory Team (CAT) Alert* newsletters and can be found at: http://www.ipm.msu.edu/soybean/aphid.htm. – *Rebecca Lamb, IPM Program.*

Tart cherry RAMP project continues to help growers with pest management

Michigan produces on average 75 percent of the United States' tart cherry crop. Most of the cherry production is on 27,000 acres of scenic orchards located along the state's western shore, from Berrien County in the southwest corner up to the northwest lower Michigan counties surrounding Traverse Bay. Cherry production directly contributes over $58 million annually to the Michigan economy.

The significance of tart cherry production in Michigan, along with proactive and progressive commodity group leadership, has led to industry collaboration with MSU researchers and the MSU IPM Program on many innovative projects. In 2003, this partnership resulted in the awarding of a four-year USDA RAMP (Risk Avoidance and Mitigation Program) grant to deliver reduced risk tart cherry pest management strategies in Michigan, Wisconsin and Utah.

The project has brought together a team of entomologists, pathologists, horticulturists, a soil microbiologist, an agricultural economist and a social evaluation specialist to work with the tart cherry industry as it encounters ever changing pest management challenges. The team includes researchers from Michigan State University, University of Wisconsin, Utah State University, Haley Consulting, LLC and Cornell University.

To ensure industry participation and leadership, the project is guided by a management team of 17 individuals from the tart cherry industry, and is co-chaired by Don Gregory (Cherry Bay Orchards, Inc., Suttons Bay, Mich.) and Jim Seaquist (Seaquist Orchards: Sister Bay, Wis.). Other management team members include extension personnel, project researchers, input suppliers, processors, growers, and pest management consultants.

The Tart Cherry RAMP project just completed its second full field season. Our focus is on developing and delivering reduced risk IPM strategies that will help keep tart cherry production viable into the future. For Michigan, Wisconsin, and Utah cherry growers, this means providing them with the tools and knowledge necessary to overcome management challenges brought about through federal regulation restricting pesticide use (Food Quality Protection Act of 1996), and reduced efficacy of some traditionally used pesticides against key pests.

Research is currently being conducted on over a dozen farms in the major cherry growing counties in the three states. We are finding that pest management de-emphasizing the use of pesticide chemistries targeted for further government restriction is possible in the short-term, with two prominent concerns: economics and long-term effects on pest management. Control programs based on using alternative materials are proving to be generally two to three times more expensive than conventional programs. The additional expense is due to the higher price of the new pesticides, and the narrower spectrum of pests that can be targeted for control. Many of the

Tart cherry RAMP project

For more information, visit : www.ipm.msu.edu/tartcherry.htm or contact:

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Soybean rust *continued from page 7*

was detected in Michigan, other Midwestern states or Canada in 2005. Scouting data were uploaded weekly to the USDA soybean rust surveillance and monitoring network website (http://www.sbrusa.net/) where the progress of the disease has been plotted on a United States map, and states' scouting reports are available.

Soybean rust did overwinter in the United States during 2004-05, and gradually spread from the Gulf Coast north through Florida, Georgia, Alabama, Mississippi and South Carolina. Economic damage has yet to be assessed and many questions about the degree and speed of spread to the northern states remain to be answered for the 2006 season.

The sentinel plot system, in cooperation with the state plant diagnostic labs has been highly successful in early identification and monitoring the spread of the pathogen in the affected states. This early warning system has allowed farmers in infected areas to time their pest management spray applications to the most effective window for disease control, and it has provided the confidence to refrain from applying control measures when and where they are not needed. – *Sandy Perry, Plant Pathology*. ♦

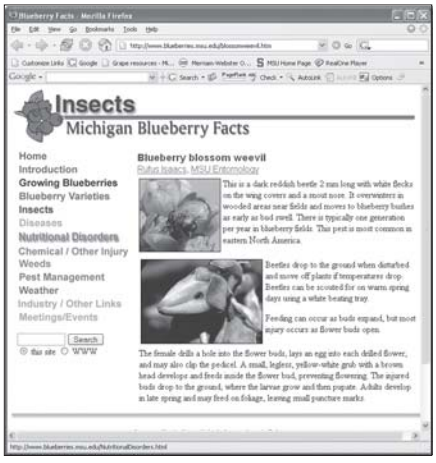
newer materials are pest specific, targeting only one or two pests, where the more traditionally used pesticides were broad-spectrum and could be timed to control several pests with one application. As profit margins have been small for fruit growers in recent years, increased costs for pest management are a major concern.

The second issue, long-term effects, also results from decreased use of broad-spectrum materials. There are many insect and disease organisms present in today's orchards that have not reached key pest status because populations have been kept at low levels through the use of broad-spectrum pesticides. As the use of these materials is reduced, control of several of these organisms may become more problematic. Project researchers are aware of these concerns, and are working with growers to learn how to incorporate reduced-risk pest management strategies in an effective and economically viable manner.

The Tart Cherry RAMP Project will continue through September 2007. – *Andrea Coombs, Entomology.* ♦

Interest continues for web site partnerships with IPM

The IPM Program's communication staff teamed up with several researchers this spring and summer to produce three web sites. The first effort collaborated with Plant Pathologist Annemiek Schilder to place content from *A Pocket Guide to IPM Scouting in Highbush Blueberries* into a new web site she was developing for blueberry growers with funding from Project GREEEN. The web site titled Michigan Blueberry Facts (http://www.blueberries.msu.edu/) includes scouting guide information under the headings of insects, diseases, nutritional disorder and chemical/other injuries. It further expands these categories with additional information from fact sheets and *Fruit Crop Advisory Team (CAT) Alert* newsletter articles. Beyond the scouting guide content, Schilder and her colleagues have compiled resources related to varieties, production practices, industry links and weather.



The second web site (http://www.invasivespecies.msu.edu/) was developed by IPM in partnership with the new Invasive Species Initiative at MSU. Coordinators of the initiative are Doug Landis (Entomology) and Doug Schemske (Plant Biology). The charge of the new initiative is to develop a multidisciplinary Great Lakes Invasive Species program at MSU that integrates research, outreach, regulatory and teaching campus-wide. A key feature of the web site is a search engine that identifies people working on various aspects of invasive species at MSU and can also be used for topical searches. Tim Polack, MSU CANR Communication & Technology Services, developed the search tool. Other members of the web team included Joy Landis (IPM Program), Carol Swinehart (Sea Grant), Robin Millsap (Emerald Ash Borer communications), Rufus Isaacs (Entomology) and Doug Landis. The web site was funded through the IPM Program.

The third web site provides information for enhancing biological control by planting native plants (http://ipm.msu.edu/plants/home.htm). Modern agricultural landscapes often lack habitats that provide the pollen, nectar and shelter resources that beneficial insects need to thrive. This web site features the work of researchers who are looking at establishing and managing native plant habitats in fields, orchards and conservation buffers to increase biological pest insect control. Entomology graduate student Anna Fiedler developed fact sheets on 24 native plants and their attractiveness to natural enemies that are included at the web site. There is also information and photos of beneficial insects. Researchers involved in the project include entomologists Doug Landis, Rufus Isaacs and Mike Brewer. The IPM Program provided the web expertise for this project. – *Joy Landis, IPM Program.* ♦

The IPM Report

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