

USDA NATIONAL INSTITUTE OF
FOOD AND AGRICULTURE'S NORTH
CENTRAL REGIONAL INTEGRATED PEST
MANAGEMENT GRANTS PROGRAM

Providing pest management
tools while protecting human
health and the environment



This work was supported by the USDA National Institute of Food and Agriculture, North Central Regional Integrated Pest Management Grants Program Management award (2013-41530-21436).



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



FEBRUARY 2016

The North Central Integrated Pest Management Center (NCIPMC) began managing the North Central Regional IPM Grants Program (NCRIPM) in 2003. During the 11 years the NCIPMC provided oversight, the grants program received 449 proposals and funded 96 projects.

Approximately \$8.5 million was invested across the region to address stakeholder identified pest management priorities. The NCRIPM Grants Program offered applicants three types of funding opportunities including research-only (up to \$100,000), extension-only (up to \$80,000) and research-extension (up to \$175,000). While these amounts are modest compared to many other competitive grant programs, these funds have addressed critical pest issues and educated diverse audiences about IPM's role in sustainable and organic pest management from field crops to schools.

Leading research and Extension personnel have coordinated projects that include a multitude of topics involving insects, weeds and diseases associated with corn, soybean, wheat, potato, sweet corn, apple, berries, stored grain and livestock systems to assist growers in achieving bountiful yields while protecting human health and the environment. Sensitive areas such as urban landscapes and golf course management projects have further reduced human exposure to pesticide applications.

Perhaps two of the most important areas addressed by the NCRIPM Grants Program that are considered vital to food security in the United States were resistance management and pollinator protection. Data obtained from grants funded by this program have impacted regulatory decisions by the Environmental Protection Agency and provided key pieces of information used in the development of the National Strategy to Promote the Health of Honey Bees and Other Pollinators.

The NCIPMC has produced a series of five publications highlighting the achievements of the NCRIPM awardees and the important impacts of over 100 projects that were funded between 1998 and 2012. The North Central Regional IPM Grants Program publication series is available electronically on the North Central IPM Center's website at ncipmc.org/action/usdanifa_sponsored_pub.php.

Susan T. Ratcliffe, Ph.D.

NCRIPM Grants Program Panel Manager and NCIPMC Director

POLLINATOR PROTECTION



David Cappaert, Michigan State University, Bugwood.org

Quantifying the intersections between neonicotinoid insecticide use for seed treatments and foraging honey bees

Reports of dead honey bees in Indiana at corn planting time led to identifying an unknown route of exposure for honey bees to neonicotinoid insecticides used in seed treatments—the talc exhaust produced by planters. The mobility of this exhaust and the high toxicity and persistence of neonicotinoids create a risk to honey bees during planting. The results of this study led to the registrants' development of novel polymers/planter lubricants to reduce dust during planting. EPA has accelerated a registration review of neonicotinoid insecticides and requested any data from land-grant researchers regarding yield benefits of seed treatments in corn and soybeans, as they continue their registration review.

GRANT AMOUNT

\$97,321

INVESTIGATORS

Krupke, C.

Holland, J. D.

PROJECT LEADER

Krupke, C.

LEAD INSTITUTION

Purdue University



RISK REDUCTION

GRANT AMOUNT

\$60,773

INVESTIGATORS

Hirsch, R. M.

PROJECT LEADER

Hirsch, R. M.

LEAD INSTITUTION

University of Wisconsin

Advancing the use of IPM with Midwest apple and grape growers

Pesticide selection and proper application is critical in cropping systems to ensure management of pests and protection to humans and the environment. Growers trained to calibrate pesticide application equipment and who used tools to evaluate pesticide risk to non-target organisms resulted in the elimination of eight pesticides with high-risk toxicity scores for avian, fish, invertebrates and small mammals. Partnership efforts continue with the packinghouse and growers to further reduce pesticide risk.



Scott Bauer, USDA Agricultural Research Service, Bugwood.org

R.A. Hammon, Bugwood.org

VECTOR IDENTIFICATION



David Riley, University of Georgia, Bugwood.org

A multi-scale approach to forecasting plant disease epidemics by identifying vector sources and reservoirs

This study documented that, in contrast to original expectations, soybean aphid was not a major vector in these cucurbit systems. This is due to the fact that soybean aphid regional flight patterns have shifted to later in the summer and they are less abundant. This shift in distribution and timing of infestation may be weather related. In contrast during cucurbit production, researchers found that the cowpea aphid was a more abundant aphid vector early in the summer and is likely more important as a vector in this system. The shift in species dominance refocused efforts to understand the genetics of the cowpea aphid to reduce its impact on cucurbit production.

GRANT AMOUNT

\$99,164

INVESTIGATORS

Kaplan, I.
Holland, J.
Michel, A.

PROJECT LEADER

Kaplan, I.

LEAD INSTITUTION

Purdue University



Howard F. Schwartz, Colorado State University, Bugwood.org

NORTH CENTRAL REGION

EDUCATIONAL RESOURCES

GRANT AMOUNT

\$48,202

INVESTIGATORS

Creswell, T. C.

Ruhl, G. E.

Bargerion, C. T.

Osborne, L. E.

Sweets, L. E.

PROJECT LEADER

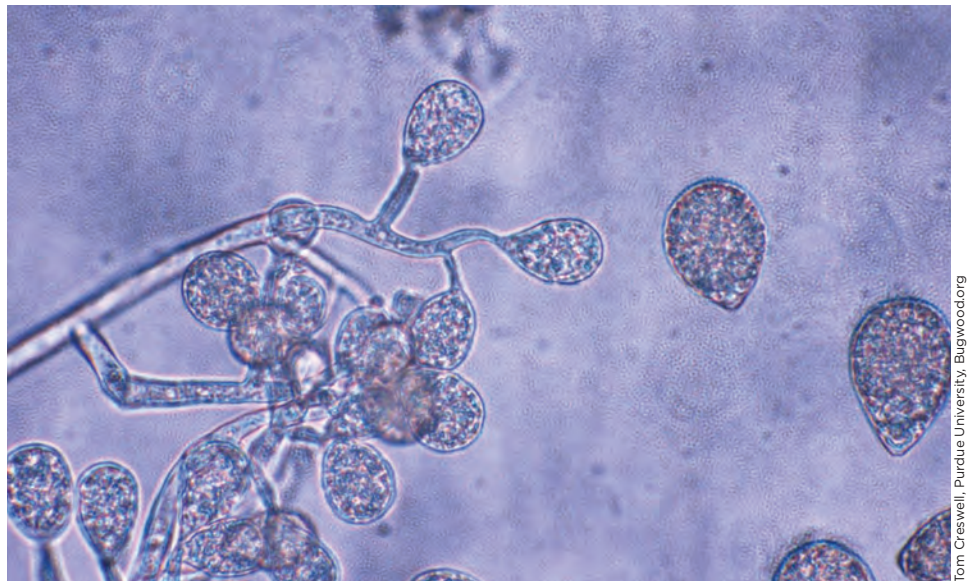
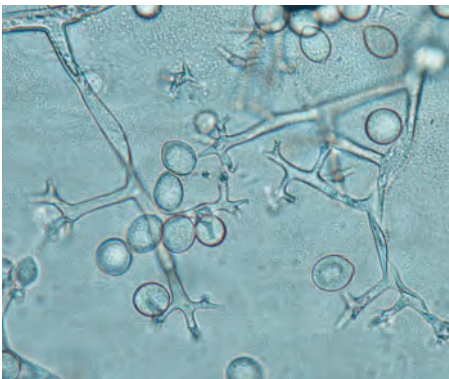
Creswell, T. C.

LEAD INSTITUTION

Purdue University

Diagnostic image series development for supporting IPM in the North Central region

Availability of accurate and high quality pest images is critical to the education of growers, crop advisors and students. This project has contributed images to the BugwoodWiki (wiki.bugwood.org/). Traffic to these pages is monitored via Google Analytics. Over the course of the project, they have received 7,778 page views from 590 users in 870 visits to the site. Average number of pages viewed per visit was 8.97, indicating that users were engaged by the content and willing to explore additional content aside from what brought them to the site.



ECONOMIC BENEFITS

GRANT AMOUNT
\$61,997

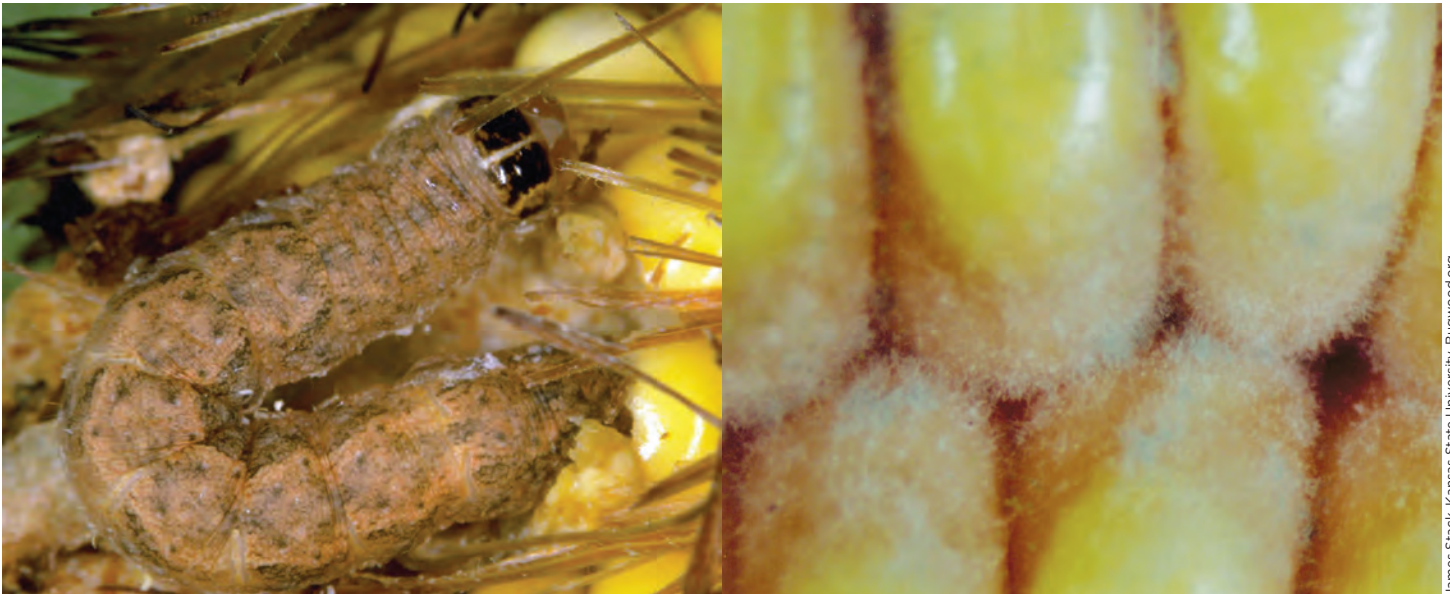
INVESTIGATORS
Wise, K.
Krupke, C.

PROJECT LEADER
Wise, K.

LEAD INSTITUTION
Purdue University

Integrating management plans for western bean cutworm and *Gibberella* ear rot

Using an iPad-based *Gibberella* ear rot diagnostic tool developed by Purdue University Extension corn and soybean growers can reduce fungicide application costs by \$24-26 per acre. A short YouTube video that was developed on scouting and ear rot identification to assist growers has received over 900 views (youtube.com/watch?v=vJoDHkXfVVg).



STAKEHOLDER NEEDS

GRANT AMOUNT
\$98,824

INVESTIGATORS
Robertson, A. E.
Jackson, T. A.
Kruger, G. R.

PROJECT LEADER
Robertson, A. E.

LEAD INSTITUTION
Iowa State University

Towards improved management of Goss's wilt in corn through enhanced understanding of epidemiological factors associated with the disease

To understand which agronomic and environmental factors contribute to the severity of disease outbreaks in corn it is necessary to determine what disease species are present.

In order to address these management needs, a multistate survey was implemented in the Corn Belt states. Of the 2,400 surveys distributed, 486 surveys were returned by participants and included leaf samples. Of the leaf samples submitted, 70% tested positive for Goss's wilt. This enabled Extension personnel in the North Central region to provide information to growers about Goss's wilt identification and factors that influence disease development.



Connie Tande, SDSU Plant Science Dept., Bugwood.org



PEST IDENTIFICATION

GRANT AMOUNT

\$10,837

INVESTIGATORS

Mueller, D. S.

Sisson, A. J.

PROJECT LEADER

Mueller, D. S.

LEAD INSTITUTION

Iowa State University

Development of scouting cards to increase recordkeeping for corn and soybean production

A key to pest management is scouting of fields to identify and quantify pest levels. To assist growers, nearly half a million scouting cards have been distributed across the North Central region. A partnership between land-grant Extension and industry leveraged additional funding and allowed for the printing of an additional 290,000 copies. All scouting card publications are available from the Extension Distribution Center (store.extension.iastate.edu/ProductList.aspxKeyword=CSI).





RESISTANCE DETECTION

Monitoring corn rootworm for development of resistance to *Bt* corn

Western corn rootworm is one of the most serious pests of corn in the United States, imposing economic losses on U.S. growers annually in excess of \$1 billion dollars. In fields where *Bt* resistance occurs, feeding injury from western corn rootworm can be severe, with greater than one node of root injury occurring resulting in an average yield reduction of 17 percent. An on-plant assay was developed to allow researchers to evaluate *Bt* resistance in growers' fields independent of industry diet assay assessments. This new resistance management assessment tool has been included in resistance management plans under consideration by EPA and registrants of corn rootworm *Bt* hybrids.

GRANT AMOUNT

\$99,661

INVESTIGATORS

Gassmann, A. J.

PROJECT LEADER

Gassmann, A. J.

LEAD INSTITUTION

Iowa State University



PEST PREDICTION

GRANT AMOUNT

\$99,031

INVESTIGATORS

Gut, L. J.

Weinzierl, R.

Nechols, J.

PROJECT LEADER

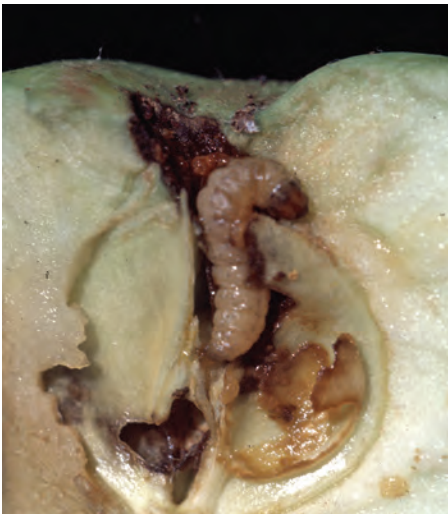
Gut, L. J.

LEAD INSTITUTION

Michigan State University

Strengthening fruit pest predictive models by incorporating effects of weather on reproductive behavior

Weather and moth flight data collected over several years was used to develop predictive models to refine the timing of insecticide spray applications to reduce damage and increase crop value. Educational presentations on the potential impact of weather on codling moth and Oriental fruit moth flight were given to approximately 5,000 agricultural stakeholders at state and regional conferences.



Whitney Cranshaw, Colorado State University, Bugwood.org



Whitney Cranshaw, Colorado State University, Bugwood.org



Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org



RISK MANAGEMENT



Tom Hlavaty, USDA ARS, Bugwood.org

Developing management plans for glyphosate-tolerant *Bt* corn: does volunteer corn present short- and long-term risks for corn rootworm management?

GRANT AMOUNT

\$89,923

INVESTIGATORS

Krupke, C. H.

PROJECT LEADER

Krupke, C. H.

LEAD INSTITUTION

Purdue University

Research findings show that corn rootworm resistance to the Cry3Bb1 *Bt* toxin has developed in several North Central states and volunteer *Bt* corn in soybean fields expresses the toxin at a more unpredictable and variable rate than the hybrid plants. As a result, sub-lethal exposure to the Cry3Bb1 toxin can hasten the development of corn rootworm resistance. Based on these findings management of volunteer corn plants is particularly important as resistance to the Cry3Bb1 *Bt* toxin continues to be found in new areas of the Corn Belt.



Howard F. Schwartz, Colorado State University, Bugwood.org

PEST DETECTION



Leah Bauer, USDA Forest Service Northern Research Station, Bugwood.org

Identifying sentinels for delimiting invasive borers in urban forests

Invasive borers are a major threat to urban forests. This project developed a process to meet the challenges posed by new and as yet undiscovered exotic invasive borers. The assessment tool provides urban foresters with a tool that can focus their activities on trees that are most likely to be attacked by an invasive borer rather than the entire urban forest. This approach was validated to detect the first emerald ash borer infested ash tree in West Lafayette, Indiana.

GRANT AMOUNT

\$92,557

INVESTIGATORS

Ginzel, M. D.
Sadof, C. S.

PROJECT LEADER

Ginzel, M. D.

LEAD INSTITUTION

Purdue University



Steven Katovich, USDA Forest Service, Bugwood.org

YOUTH EDUCATION

GRANT AMOUNT

\$59,832

INVESTIGATORS

Mueller, D. S.

Staker, J. W.

Schultz, T. L.

PROJECT LEADER

Mueller, D. S.

LEAD INSTITUTION

Iowa State University

Development of an IPM curriculum with scouting competitions to promote youth education

Training the next generation of Integrated Pest Management scientists is critical to food security. Educational materials including a 14-part PowerPoint series on IPM topics with scripts for instructors and a computer-based learning module that covers the basics of scouting corn and soybean fields were developed and are available at ipm.iastate.edu/ipm/crops scouting and cai.iastate.edu/modules/module.aspx?modID=114. These materials were delivered to over 230 high school and community college agricultural teachers and 4-H instructors. A one-day scouting competition has been held since 2012 with both indoor and outdoor components in partnership with DuPont Pioneer, the Iowa Soybean Association, and the Iowa Independent Crop Consultants Association.



Lesley Ingram, Bugwood.org



The screenshot shows the CAI website interface. At the top, the URL is cai.iastate.edu. The header includes the Iowa State University logo and navigation links: Cart | Login | Register | Help. Below the header is a banner with various agricultural images. The main content area is titled 'Scouting Fields' and includes a 'Description' section. The description states: 'When students are finished with this module, they will have: - Learned why field scouting is important and the basics of what a scout does - Learned how to prepare before the season - Learned the basics of scouting, including scouting patterns, assessment methods, and submitting samples - Learned some of the specifics of soybean scouting, including how to correctly determine growth stage of a soybean field and what problems one should be particularly aware of during each stage - Learned some of the specifics of corn scouting, including how to correctly determine the growth stage of a corn field and what problems one should be particularly aware of during each stage.'

Below the description, there is a table with the following information:

CEUs and Area:	2.0 CM
Approved by:	ASA
Item Number:	SS 04780
Free Online Version:	None
(CEU test costs money)	
Module Homepage:	None
Module Developers:	Lori Abendroth, Dr. Roger Elmore, Dr. Daren Mueller, Dr. Alison E. Robertson, Clarke McGrath, Dr. Erin Hodgson, Adam Sisson, Dr. Alison Robertson, Dr. Kristine Schaefer

At the bottom of the page, there is a link: [Click Here For System Requirements](#).

PEST REDUCTION



Whitney Cranshaw, Colorado State University, Bugwood.org

Development and implementation of novel strategies for stable fly IPM

Stable flies are considered a major pest in both urban and rural environments due to their painful and persistent biting. While often considered a livestock pest issue, the ability of stable flies to utilize a variety of organic materials during development expands their habitat. Different volatiles emitted from fresh and aged horse manure have been isolated and characterized to develop a lure for stable fly egg laying attractant. A lure was developed to reduce populations by disrupting egg laying by the female stable flies.

GRANT AMOUNT

\$92,711

INVESTIGATORS

Zurek, L.

PROJECT LEADER

Zurek, L.

LEAD INSTITUTION

Kansas State University



DETECTION NETWORK

GRANT AMOUNT
\$99,987

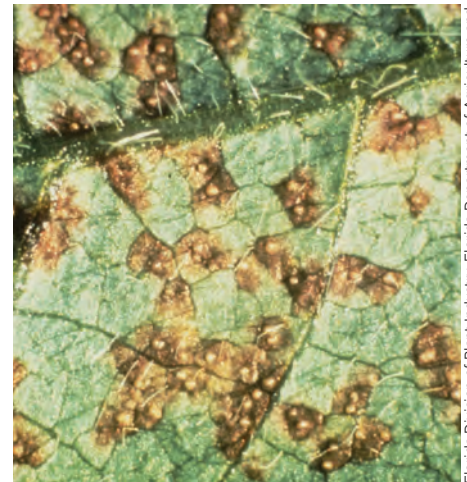
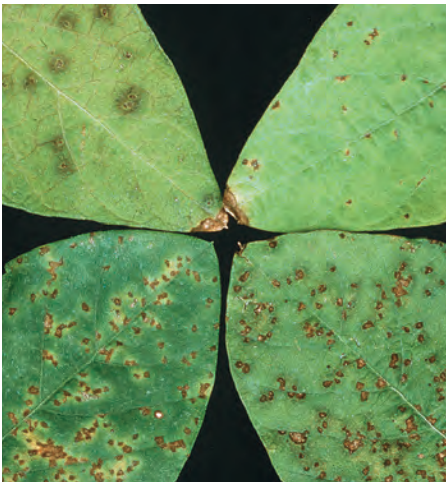
INVESTIGATORS
Garrett, K.
Scoglio, C.

PROJECT LEADER
Garrett, K.

LEAD INSTITUTION
Kansas State University

Network analysis for forecasting the spatial progress of soybean rust epidemics and optimizing sentinel plot strategies

Effective disease management in soybean and other field crops relies on identification of pathogens by monitoring fields. Scouting is time consuming so a model was developed to improve sampling strategies for soybean rust, wheat rusts and other emerging diseases. The strategy identifies the most important sampling locations in an epidemic network to provide maximum benefit with minimal efforts. The utility of the model was demonstrated for soybean rust, but the general principles can be applied in most epidemic invasions.



Reid Frederick, USDA Agricultural Research Service, Bugwood.org

Florida Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Bugwood.org



BIOLOGICAL CONTROL



Understanding functional linkages between natural enemies and pests to improve North Central region tree fruit Integrated Pest Management and production

GRANT AMOUNT

\$65,181

INVESTIGATORS

Grieshop, M.

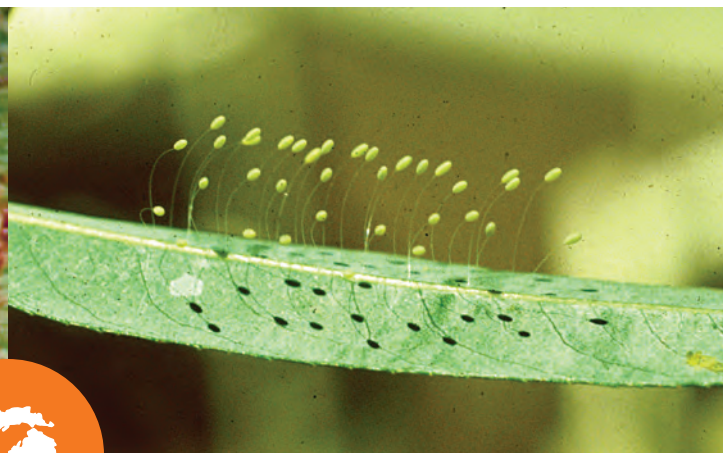
PROJECT LEADER

Grieshop, M.

LEAD INSTITUTION

Michigan State University

Natural enemies control a variety of pests and are more abundant in organic apple orchards than conventional apple orchards. The abundance of predators was evaluated using a variety of monitoring techniques that can be implemented by growers to better assess the presence of natural enemies in their orchards. With limited pest management options in organic production systems these data can assist in treatment decisions and more effective pest management.





Eric Burkness, Bugwood.org

Using pheromone traps to predict oviposition and damage by *Helicoverpa zea* (Boddie) on sweet corn

In sweet corn, wind, humidity, the phases of the moon and the timing of plant silking impact egg laying of the corn earworm. This pest damages the corn ear and makes it unmarketable. Data collected in this study allows growers to better time their insecticide applications to prevent pest damage and reduce unnecessary treatments.

GRANT AMOUNT

\$94,564

INVESTIGATORS

Foster, R. E.

Krupke, C.

Weinzierl, R.

PROJECT LEADER

Foster, R. E.

LEAD INSTITUTION

Purdue University



Howard F. Schwartz, Colorado State University, Bugwood.org

PESTICIDE REDUCTION

GRANT AMOUNT

\$97,152

INVESTIGATORS

Richmond, D. S.

Holland, J.

Alexander, C.

Williamson, R. C.

Gibb, T.

Bigelow, C.

PROJECT LEADER

Richmond, D. S.

LEAD INSTITUTION

Purdue University

IPM for white grubs on golf courses: clarifying biological and economic trade-offs

This study demonstrated that white grub population infestations in turf can be estimated by using mean grub densities in “hot spots.” This approach allows golf courses to use these data as predictors for grub infestations on a larger spatial scale. When grub densities are low in hot spots, so are overall densities allowing for reduced insecticide applications on golf courses and other urban turf areas.

Alton N. Sparks, Jr.,
University of Georgia,
Bugwood.org



PEST PREDICTION

Todd M. Gilligan and Marc E. Epstein, Tortricids of Agricultural Importance, USDA APHIS ITP, Bugwood.org



Validation and implementation of a degree day model for grape berry moth management in the North Central states

GRANT AMOUNT

\$96,953

INVESTIGATORS

Isaacs, R.
Weinzierl, R.
Rothwell, N.

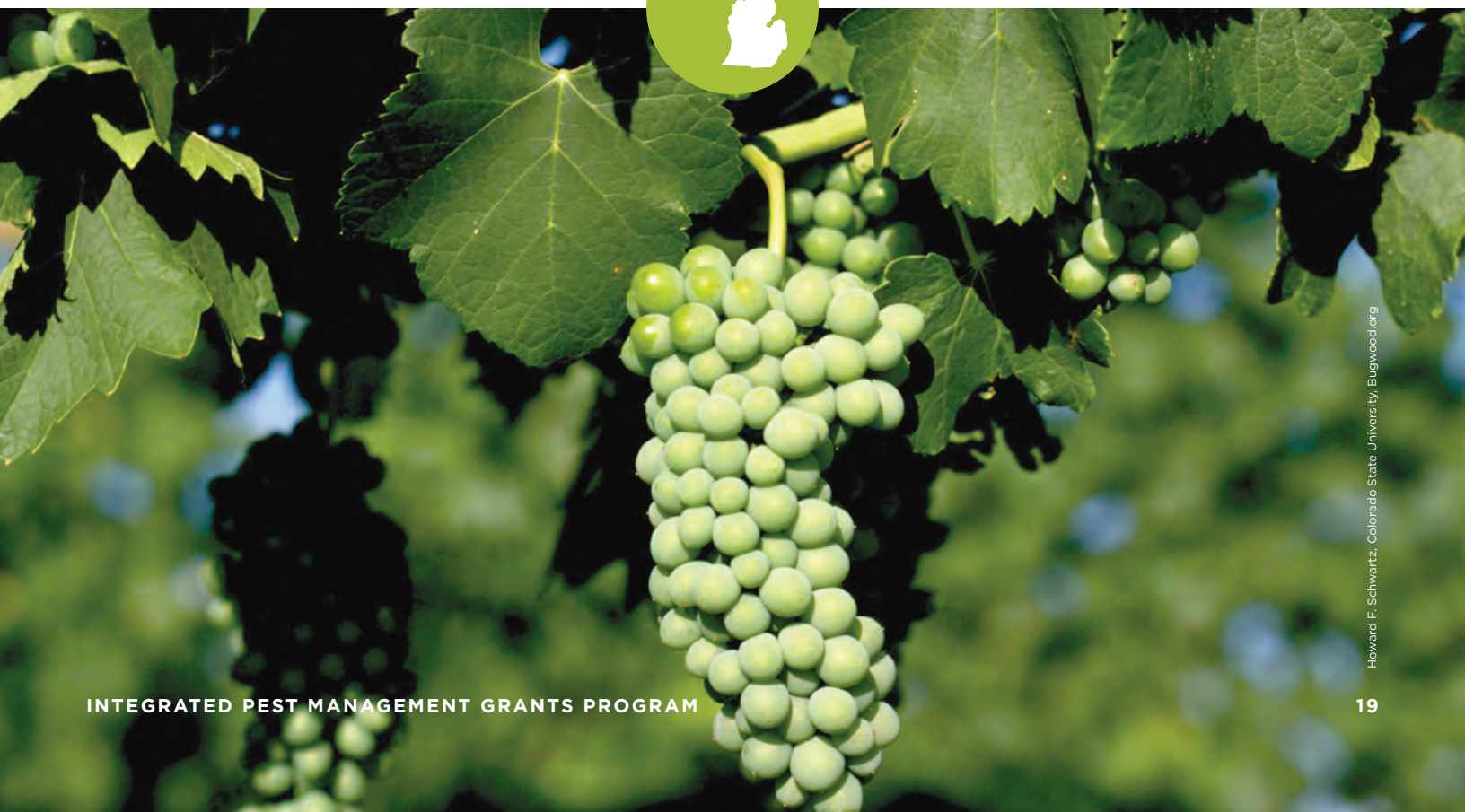
PROJECT LEADER

Isaacs, R.

LEAD INSTITUTION

Michigan State University

Scouting and monitoring of vineyards for grape berry moth in Michigan and Illinois was used to refine and validate the predictive model for grape berry moth and to guide applications of treatments to control the infestations. This project improved the model interface and amended the system to take account of the possibility of a late-season fourth generation of this pest, as observed during 2010. In 2011 this model predicted a partial third generation near harvest time, and growers were able to use this information to better protect their crops from pest damage.



Howard F. Schwartz, Colorado State University, Bugwood.org

PRECISION AGRICULTURE

GRANT AMOUNT

\$97,500

INVESTIGATORS

Ozkan, H. E.

Zhu, H.

Derksen, R.

Bonello, P.

Hermes, D. A.

Ellis, M.

Welty, C.

PROJECT LEADER

Ozkan, H. E.

LEAD INSTITUTION

The Ohio State University

Reducing pesticide consumption through target oriented variable rate application in orchards and nurseries

Field tests demonstrated that the use of a precision sprayer could reduce the airborne spray drift by three to eight times and the pesticide spray volume by 50 to 70 percent during a growing season. For an orchard with a six-spray schedule this translates to a savings of \$900 to \$1,260 per acre. In the United States apples are produced on 488,273 acres. Transition to precision spraying translates to a potential savings of \$122 million dollars if only 25% of commercial apple farms adopt this new technology.



WEED SUPPRESSION

GRANT AMOUNT
\$95,816

INVESTIGATORS

Regnier, E. E.
Harrison, S. K.
Metzger, J. D.
Bennett, M. A.

PROJECT LEADER

Regnier, E. E.

LEAD INSTITUTION

The Ohio State University

Renewable mulches for integrated weed management in small-scale crop production

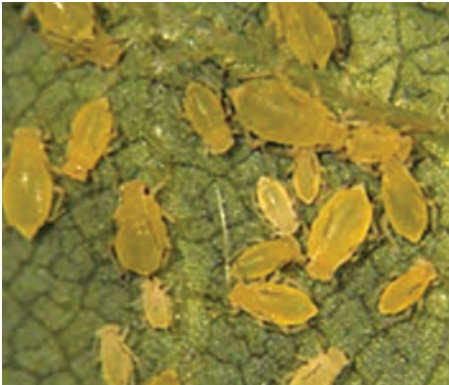
Two master's students conducted field and greenhouse experiments in collard and squash production to evaluate the effects of mulches on weed populations, crop growth, yield, and pollinator activity of the squash bee. Based on findings from this study, a renewable mulch was developed and an invention disclosure (Tech ID #2013-159) was filed with The Ohio State University Office of Technology Commercialization & Knowledge.



Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org



HOST PLANT RESISTANCE



David W. Ragsdale, Texas A&M University, Bugwood.org

Inheritance of virulence in the soybean

Results of this project confirmed the presence of different virulence genes in soybean aphid biotypes and may explain soybean aphids' differential ability to colonize soybean plants. Information on the frequency and distribution of soybean aphid biotypes will enable plant breeders, soybean seed companies, university Extension scientists, and soybean producers to intelligently deploy soybean aphid resistant soybean cultivars where they would be most effective, and reduce the need for pesticides.

GRANT AMOUNT

\$94,995

INVESTIGATORS

Hill, C. B.

Hartman, G. L.

Voegtlin, D.

PROJECT LEADER

Hill, C. B.

LEAD INSTITUTION

University of Illinois



Michasia Harris, University of Georgia, Bugwood.org

ON-FARM RESEARCH

GRANT AMOUNT

\$29,249

INVESTIGATORS

Mueller, D. S.

Tylka, G. L.

Dixon, P. M.

PROJECT LEADER

Mueller, D. S.

LEAD INSTITUTION

Iowa State University

Facilitating real world crop production research through experimental design and data collection and analysis training

More than ever before, crop management products are being promoted to growers based on data that are incomplete or otherwise of questionable scientific validity to support product sales. To address this concern, over 50 individuals representing Extension personnel, agribusiness, and leading growers conducted a two-day conference to allow a greater understanding of how to properly conduct on-farm research as well as interpretation of field-research results.



WEED REDUCTION

GRANT AMOUNT

\$94,696

INVESTIGATORS

Sprague, C. L.

Taylor, E. C.

Renner, K. A.

PROJECT LEADER

Sprague, C. L.

LEAD INSTITUTION

Michigan State University

Winter annual weed seed fate in no-till cropping systems

Timely management of winter annual weeds reduces seed production which can reduce problems with planting and pest management. Information on the importance of winter annual weed management was shared broadly with growers at conferences, in blog posts and on YouTube. The YouTube video, entitled “2010 Winter Annual Weed Seed Study” has been viewed over 1,300 times.



Theodore Webster, USDA Agricultural Research Service, Bugwood.org



John D. Byrd, Mississippi State University, Bugwood.org



SUSTAINABLE LANDSCAPES

GRANT AMOUNT

\$15,211

INVESTIGATORS

Kroening, M. K.

Starbuck, C. J.

Quinn, J. A.

PROJECT LEADER

Kroening, M. K.

LEAD INSTITUTION

University of Missouri

A statewide educational program featuring IPM in the urban homeowner's landscape

The materials developed through this project have been utilized to educate over 400 individuals in Missouri about environmentally responsible landscape management practices. Workshop participants indicated they were very likely to make simple changes in their landscape management practices that can reduce the use of pesticides by up to 50 percent. A \$10,000 "mini-grant" was obtained from the Missouri Department of Natural Resources to provide funding for communities to initiate Healthy Yards for Clearer Streams Programs and support the production of educational materials.



Andrew Koeser, International Society of Arboriculture, Bugwood.org

Gary Kling, University of Illinois, Bugwood.org

COVER CROPS

GRANT AMOUNT
\$93,990

INVESTIGATORS
Gibson, K.
Weller, S. C.

PROJECT LEADER
Gibson, K.

LEAD INSTITUTION
Purdue University

Integration of late-season weed control into vegetable production systems

Organic growers who produce fresh market tomatoes rely heavily on manual weeding. This project stimulated new research on the potential use of living mulches to manage seed banks in tomatoes and potentially reduce production costs. The use of living mulches coupled with mowing between rows has the potential to reduce the need for manual weeding while not impacting yields in organic fresh market tomatoes.



WEED MANAGEMENT

GRANT AMOUNT
\$5,000

INVESTIGATORS

Renner, K. A.

Hill, E. C.

Sprague, C. L.

Mutch, D. R.

PROJECT LEADER

Renner, K. A.

LEAD INSTITUTION

Michigan State University

Advancing existing knowledge of integrated weed management

Weed management in organic production systems can be a costly challenge in reduced yields and increased personnel expenses. This study developed a new Michigan State University Extension bulletin covering integrated weed management for organic systems. Additional funding leveraged in support included Project GREEN (Generating Research and Extension to meet Economic and Environmental Needs) and United States Department of Agriculture Cooperative State Research, Education and Extension Service, Michigan Sustainable Agriculture Research and Education Program.



Howard F. Schwartz, Colorado State University, Bugwood.org



Gerald Holmes, California State University, Stanislaus, Bugwood.org

GROWER EDUCATION

GRANT AMOUNT

\$23,462

INVESTIGATORS

Hogg, D.

Proost, R.

Jensen, B.

PROJECT LEADER

Hogg, D.

LEAD INSTITUTION

University of Wisconsin

Revitalizing potato leafhopper IPM in alfalfa through local farmer networks

To better assess growers' needs for potato leafhopper management in alfalfa, surveys were conducted prior to the development of educational programs and at a follow-up meeting. The results of these surveys indicated that both the knowledge and behavior of the farmers were positively influenced (i.e., toward IPM and away from prophylactic insecticide use) by their participation in the educational program. Use of a sweep net for potato leafhopper scouting was helpful in changing farmer behavior.



Steve L. Brown, University of Georgia, Bugwood.org



Bryan Jensen, University of Wisconsin, Bugwood.org



GRANT AMOUNT

\$99,986

INVESTIGATORS

Regnier, E. E.

Harrison, S. K.

Taylor, R. A.

Diekmann, F.

Loux, M. M.

Cardina, J.

PROJECT LEADER

Regnier, E. E.;

LEAD INSTITUTION

Ohio State University

Slowing the spread of giant ragweed through region-wide management

Giant ragweed is a major challenge for farmers and allergy sufferers in the North Central Region of the United States. It is escaping current management tactics as well as expanding into previously non-infested areas.

In this research the cause of ragweed spread and areas that are vulnerable to its invasion were identified. Researchers developed new guidelines for giant ragweed management and have shared this information broadly to address this growing problem.



Chris Evans, University of Illinois, Bugwood.org



John D. Byrd, Mississippi State University, Bugwood.org

PEST REDUCTION

GRANT AMOUNT

\$99,646

INVESTIGATORS

Guedot, C.

Isaacs, R.

Asplen, M. A.

Gratton, C.

Hutchison, W.

PROJECT LEADER

Guedot, C.

LEAD INSTITUTION

University of Wisconsin

Developing and delivering sustainable SWD management solutions for North Central region berry growers

Spotted wing drosophila is an invasive insect pest that economically affects soft skinned fruit, including berries and can significantly increase pesticide applications as growers try to protect their crops. To assist berry producers address this problem, researchers evaluated the effect of nearby woodland landscape on infestation levels and determined exclusion netting reduces the need for chemical control.



Gevorg Arakelian



PEST IDENTIFICATION



Developing aquaculture IPM strategies and training for fish farmers in Missouri

Aquaculture is growing and fish are predicted to be a main source of food for the world in the future. The greatest economic loss and threat to farmed fish is disease. Working together, researchers and fish farmers formed a network to share knowledge and implemented IPM strategies. Monitoring has led to pest identification resulting in reduced management costs and healthier fish.

GRANT AMOUNT

\$14,837

INVESTIGATORS

Borgwordt, C. J.

Hicks, C.

PROJECT LEADER

Borgwordt, C. J.

LEAD INSTITUTION

Lincoln University



PESTICIDE REDUCTION

GRANT AMOUNT
\$71,897

INVESTIGATORS
Buczkowski, G.
Wang, C.

PROJECT LEADER
Buczkowski, G.

LEAD INSTITUTION
Purdue University

Evaluating IPM approaches to bed bug management in public housing

Bed bugs are a serious economic and medical pest that continues to spread due to their hitchhiking and cryptic behavior making early detection difficult. Available treatment methods are expensive, time-consuming, and eradication often requires professional pest management intervention. Sports tape impregnated with insecticide dust provided effective control while lowering human exposure to insecticides.

This management tool can be made without tools or prior experience and offers a highly localized insecticide delivery system that is highly effective.



Gary Alpert, Harvard University, Bugwood.org



Allen Szalanski, Bugwood.org



North Central
IPM
Center

