

Western
IPM
Center

2019

Annual Report



Western Integrated Pest Management Center
Creating a Healthier West with Fewer Pests

From Director Amer Fayad

New Beginnings and Challenges Defined 2019

Friends,

Thank you for your continued support of the Western IPM Center and the important work we do. If we haven't met yet, I had the privilege of joining the Center in August, coming from the IPM Innovation Lab at Virginia Tech. At the Innovation Lab, we promoted integrated pest management to growers in developing nations, and my work involved a lot of international travel and teaching.

So for me personally, and for the Western IPM Center itself, 2019 was a year of transition and change.

The Western IPM Center was understaffed for the first half of the year, then in the fall our funder, the U.S. Department of Agriculture's National Institute of Food and Agriculture, relocated from Washington, D.C. to Kansas City, Missouri. The move resulted in huge turnover at NIFA, and we're hopeful that as the agency hires new staff in Kansas City that business will keep running smoothly.

Through those challenges, the Western IPM Center stayed vital and active. We funded 10 projects in 2019, from rodent and kochia work groups to research into codling moth mating disruption and bacterial blight in seed crops.

We launched a new signature program helping extension educators throughout the West better understand and communicate the uncertainties of risk (especially pesticide risk) to growers and stakeholders.

Center Associate Director Matt Baur, in addition to leading the Center for much of 2019 and overseeing our grant program, also was an active participant in the Western Governors' Association initiative on invasive species. Matt continues to work with the WGA on implementing its initiative to better share and communicate information about newly detected or spreading invasive species.

Center Communicator Steve Elliott continued to spotlight the variety of places and ways integrated pest management is used to protect people and the environment from pests, reporting stories from as far away as Guam and as unexpected as IPM in Yellowstone National Park. His work received four awards from the Association of Communication Excellence in Agriculture and Natural Resources, including gold honors for stories on emerald ash borer in Colorado and coyotes in Southern California.

The year ended with our call for proposals for the 2020 funding cycle. We received 36 proposals representing 10 of the 13 Western states, and our review panels were impressed by the quality of those submissions. The projects selected for funding are listed in this report.

Thank you for reading and sharing our annual report, and for your help in creating a healthier West with fewer pests. I look forward to working with you in the year ahead.



Amer Fayad, Ph.D

Amer Fayad

At a Glance:

2014-2018 Western IPM Center Grant Outputs



24 journal articles



273 conference papers or presentations



26 websites



3,933 people directly trained



One book



229 Extension publications



48 newsletters



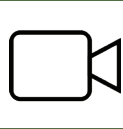
Two audios



84 workshops



Eight survey instruments



28 videos

IPM Strategic Planning for Organic and Conventional Brassicaceae Vegetable Crops in Oregon and Washington

Katie Murray, Oregon State University, \$14,999

Type: Planning Document

Center Priorities Identified: Biological Control of Pests, IPM and Ecosystem Services, IPM for Pest-Resistance Management, New Technologies to Manage Pests, Soil-Borne Pest Management

The Pacific Northwest is a premier production area for both conventional and organically grown vegetable Brassicaceae crops, including broccoli, Brussels sprout, cabbage, cauliflower, greens, horseradish, radish and turnip. Many pests of these crops have lengthy and overlapping population peaks which makes spray programs alone unsuccessful; instead, integrated approaches with cultural management and biocontrol are needed. This project will develop an IPM Strategic Plan for brassica vegetable crops that documents the current practices and priorities of both organic and conventional farmers. The process will enable the industry to discuss and identify current and emerging pest management concerns and needs.



Varroa Mite Tolerance in Hawaii's Honeybees: Field and Laboratory Testing of a Dynamic System

Ethel Villalobos, University of Hawaii, \$28,819

Type: Project Initiation

Center Priorities Identified: Biological Control of Pests, IPM and Ecosystem Services, IPM for Indigenous, Insular and Isolated People, IPM for Pest-Resistance Management, New Technologies to Manage Pests

The Varroa mite is a deadly pest of honeybees and linked to a viral disease known as deformed wing virus. The development of resistant bees through selective breeding has been ongoing in the United States and Europe for decades. Natural behaviors, called hygienic behaviors, which are based on the inspection and removal of dead capped brood, are being used to reduce the mite load of bee colonies. This study will investigate the presence of mite-resistant populations in Hawaii and examine whether recapping behavior is a reliable proxy for mite resistance and if it is linked to reduced mite reproduction.

2020 Western IPM Center Funded Projects

In consultation with our advisory committee and stakeholders, the Western IPM Center adopted 11 priorities in 2019 and for the first time asked grant applicants which priority area their project supported. Each of those priorities is addressed in one or more of these 10 projects selected for funding.

For a full description of each priority area, visit westernipm.org/index.cfm/center-grants/priorities/



Mid Klamath Invasive Species Management Collaboration

Tanya Chapple, Mid Klamath Watershed Council, CA, \$30,000

Type: Work Group

Center Priorities Identified: IPM and Ecosystem Services, IPM for Indigenous, Insular and Isolated People, Invasive Species

This project seeks to strengthen and build capacity of a long-established work group that includes the Karuk, Yurok and Hoopa tribes, the Quartz Valley Indian Reservation, two national forests and multiple resource conservation districts and watershed councils (among others). The work group will address invasive species concerns across political boundaries of Humboldt and Siskiyou counties, national forests and the ancestral territories of the Karuk, Yurok and Hoopa tribes. The region warrants its own invasive species management area due to considerations unique to the Klamath Mountains, such as their remote location, rugged terrain, tribal sovereignty, and committed community opposition to herbicide use.

Development of an Integrated Pest Management Strategic Plan for Dairy Cattle in California

Alec Gerry, University of California, \$14,986

Type: Planning Document

Center Priorities Identified: IPM Culture and Capacity, IPM in New Places, New Technologies to Manage Pests

To capture the current state of pest management in the California dairy industry, this project will produce a Pest Management Strategic Plan following the general guidance outlined by Oregon State University Extension for an IPM Strategic Planning Process. The resulting document will describe the modern dairy industry in California as well as the major pests, challenges to pest management and critical needs for future research and regulatory action to support the dairy industry. Major pests and strategies to manage these pests will be identified by producers, veterinarians and extension personnel, and ranked by their economic importance.

Demonstration and Outreach for Control of Stable Flies and Cattle Bunching on California Dairies

Sharif Aly, University of California, \$23,000

Type: Outreach & Implementation

Center Priorities Identified: IPM Culture and Capacity, IPM in New Places

Each spring, California dairy cows suffer stable fly (*Stomoxys calcitrans*) season. Stable flies are one of most serious pests of dairy cattle in the United States. High stable fly numbers will reduce weight gain, feed efficiency and milk production of dairy cows. The project team recently completed research on the epidemiology, risk factors and management of stable flies. Now it is important to extend this information to the dairy industry. This effort will provide dairy producers, herd managers, dairy nutritionist and veterinarians in California outreach knowledge about stable fly biology and behavior, risk factors for cattle bunching and IPM-focused methods for fly control on dairies.

Habitat Management in Alfalfa Irrigation Ditches: Evaluating the Potential for Conservation Biological Control of Aphid Pests

Elizabeth Pringle, University of Nevada, \$29,996

Type: Project Initiation

Center Priority Identified: Biological Control of Pests

Aphids cause serious yield losses in Western alfalfa. The broad-spectrum insecticides typically used for aphid control can harm beneficial insects and lead to insecticide resistance. This project will investigate habitat management as a means to augment biological control by aphid predators in irrigated desert alfalfa. Weedy plants that occur naturally in irrigation ditches may act as sources of indigenous predators, and this project will investigate whether engineering this habitat would be effective as a management strategy to control alfalfa aphid pests.

Identification of Environmental and Agronomic Factors Influencing Potato Powdery Scab Disease in the San Luis Valley, Colorado

Ana Cristina Fulladolsa, Colorado State University, \$23,000

Type: Project Initiation

Center Priorities Identified: New Technologies, Soil-Borne Pest Management

Spongospora subterranea (Ss) is a soil-borne pathogen that causes powdery scab in potato and can transmit the *Potato mop-top virus* (PMTV). Farmers try to predict powdery scab disease-risk based on soil tests for Ss sporosori inoculum, but the disease is also influenced by production practices and environmental factors. The objectives of this research are to identify environmental and management inputs that correlate with Ss soil inoculum level changes and the development of powdery scab and PMTV in field-grown potatoes; and to construct a mathematical model using those factors to aid agronomists and farmers in the San Luis Valley in making management decisions.

Western IPM Kochia Work Group

Todd Gaines, Colorado State University, \$29,993

Type: Work Group

Center Priorities Identified: IPM for Pest-Resistance Management

This renewal of the 2019 Western IPM Kochia Work Group will focus on implementing and coordinating research and educational objectives for the widespread weed *Kochia scoparia*. This effort will address three priorities identified by the 2019 work group. The first is to establish long-term soil seedbank studies at multiple locations. The second is to develop standardized herbicide resistance testing and reporting protocols for kochia, including production and distribution of standard reference seed lines. The third is to continue the research and education network to share results and develop new funding proposals to address additional work group priorities.

Developing a New Method for Controlling Weeds Using Electricity: An Environmentally Friendly, Non-Herbicidal, Tree and Weed Killing Technique

Erik Lehnhoff, New Mexico State University, \$29,999

Type: Project Initiation

Center Priorities Identified: New Technologies, Urban Pest Management

Urban weed management in the United States costs billions of dollars and uses millions of pounds of herbicide annually, yet weeds remain abundant and problematic. Many cities, seeking to alleviate concerns about the health impacts of herbicides, have banned the use of some herbicides, which further exacerbates management difficulties. This project will (in suburban and urban environments) test, refine and showcase a new technology the project team previously developed to manage weeds safely and effectively using electricity. The team previously demonstrated the system's effectiveness, but refinements and advancements are needed to make it applicable for more situations and weed species, and to increase user friendliness.

Western Hemp IPM Work Group

Amanda Skidmore, New Mexico State University, \$29,690

Type: Work Group

Center Priorities Identified: IPM Culture and Capacity, IPM and Ecosystem Services, IPM for Pest-Resistance Management, IPM in New Places

While production of industrial hemp (*Cannabis sativa*) is rapidly expanding, developing IPM plans for the industry is a challenge because of a lack of science-based research available due to the crop being banned for more than 60 years. Also, because industrial hemp can be grown for medical uses, fiber, or food and forage, producers are essentially looking at three separate cropping systems. Although pests are similar across those systems, IPM practices need to be adapted for each based on the planned end-use. This work group will address regional management challenges and stakeholder education. It will hold a workshop and produce educational materials for industrial hemp production (management guides, extension videos and a website) for the Western United States.



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Introducing the Western Integrated Pest Management Center

At the Western IPM Center, we promote smart, safe and sustainable pest management to protect the people, environment and economy of the American West. Our vision is a healthier West with fewer pests.

The Western IPM Center funds and promotes IPM development, adoption and evaluation to solve pest problems in agriculture, natural settings and communities. As one of four Regional IPM Centers funded by the USDA National Institute of Food and Agriculture, we serve as the hub of a multi-state partnership and communication network helping researchers, growers, extension educators and others work across state lines and academic disciplines to manage pests safely and effectively.

From our main office in Davis, California, and through network coordinators in Arizona, Hawaii and Oregon, we serve 17 Western states and Pacific Island territories.

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