**NCERA222: Integrated Pest Management**

**Annual Report**

**Compiled by Robert Wright, University of Nebraska-Lincoln**

**Project Number:** NCERA222

**Project Title:** Integrated Pest Management

**Period Covered:** 2016

**Date of This Report:** 9/6/2017

**Annual Meeting Dates:** 3/21/2017 to 3/22/2017

**Participants**

**NCERA State Representatives:** Sue Ratcliffe, Univ. of Illinois; Cliff Sadoff, Purdue Univ.; Daren Mueller, Iowa State Univ.; Frannie Miller, Kansas State Univ.; Joy Landis, Michigan State Univ.; Bill Hutchison, Univ. of Minnesota; Lee Miller, Univ. of Missouri; Bob Wright, Univ. of Nebraska; Patrick Beauzay, North Dakota State Univ.; Jim Jasinski, The Ohio State Univ.; Paul Johnson, South Dakota State Univ.; Bryan Jensen, Univ. of Wisconsin

**NC IPM Center:** Sue Ratcliffe, Univ. of Illinois; Lynnae Jess, Michigan State Univ.; Laurie Vial, Univ. of Illinois

**USDA-NIFA:** Herb Bolton, Rubella Goswami

**EPA:** Seth Dibblee

**APLU:** Jeff Jacobsen

**Brief Summary of Minutes**

**Tuesday March 21st**

Welcome and introductions (Pat Beauzay, group)

National IPM Coordinating Committee Update (Pat Beauzay)

NC IPM Center Update (Sue Ratcliffe, Lynnae Jess)

ECOP/ESCOP/APLU/ Administrative Update (Jeff Jacobsen)

EPA Update (Seth Dibblee)

NIFA Update (Herb Bolton, Rubella Goswami)

Begin State IPM Reports

Sunflower iPiPE Program in North Dakota (Sam Markell, Janet Knodel)

North Dakota Ag Weather Network (NDAWN) Applications in IPM (Daryl Ritchison, Janet Knodel, Andrew Friskop, Mohamed Khan, Andrew Robinson)

State IPM Reports (continued)

**Wednesday March 22nd**

State IPM Reports

Open Discussion

NCERA222 Business Meeting

-Upload State Reports to Basecamp website

-Robert Wright (Univ. of Nebraska-Lincoln) was elected Chair, effective immediately to fill vacancy caused by resignation of Jaime Pinero; motion by Ravlin, seconded by Ratcliffe. Vote was unanimous. Lee Miller (Univ. of Missouri) is Chair-elect

-2018 meeting will occur in association with Int. IPM Symposium, Baltimore MD,

Continue State IPM Reports

Open Discussion

Adjourn

**Accomplishments**

**University of Illinois:**

First Detector Invasive Pest Workshops were held in 6 locations across the state, attracting

over 200 registrants. Attendees were trained in emerging and current invasive species risks,

including invasive insect threats to forests, jumping worms, thousand cankers disease,

boxwood blight, and the updated Illinois Exotic Weed Act. Course elements included:

identification/detection, life cycle, hosts, sampling, management, look-a-likes, and regulation.

Each workshop also offered a hands-on section where participants examined samples, asked

questions, and used problem-solving skills to identify the pest.

**Purdue University:**

**Herbicide Resistant Weed Meetings** were held at 3 locations in 2016, 6 locations in 2015, and 3 locations in 2014. Herbicide-resistant field days were held at two sites in the summer of 2015 and 2016. These half-day meetings and field days were specifically targeting areas with severe infestations of glyphosate resistant weeds. Weed identification, weed biology, control strategies, and an understanding of herbicide modes of action and new mode of action labeling were presented. Over 500 people attended the meetings and field days each year. In addition, multi-day, Herbicide Action courses were provided in both 2015 and 2016.  In 2017, we are in the planning stages to conduct four in-field field days to demonstrate proper application techniques for dicamba and 2,4-D herbicides in their new herbicide-resistant soybean varieties. To date we have produced around 2 dozen, 1-page fact sheets on the biology and management of specific weeds, and have 3 more of these in various stages of preparation for release in 2017.

**Iowa State University:**

An **Iowa Pest Resistance Management Plan** (IPRMP) was started following a strategic planning meeting with farmers, commodity groups, ag industry, state government and academics. A primary goal of the IPRMP is “todocument and promote holistic and integrated management solutions that will effectively and sustainably control pests, postpone or delay resistance development, foster methods of early detection and then mitigate, to the extent possible, the spread of pest resistance.”

Because mobile pests affect wide areas, a community acting together is required to combat pest resistance. This community includes not only farmers but landowners, farm managers, crop advisors, financial institutions, technology, seed and input providers and others. Thus, efforts to reach and initiate change with this diverse group must incorporate the natural and socio economic sciences to be successful. This project is unique in that it focuses on the social aspects of implementing resistance management by the people in charge of making management decisions, rather than simply pest biology.

Combining expertise from plant pathology, entomology, weed science, economics and sociology, four pilot projects on resistance management will be developed and initiated on western corn rootworm, soybean aphid, Palmer amaranth and waterhemp in Iowa communities. Focusing on socioeconomic factors, community leaders/champions will be identified as agents of change and long-term economic benefits for farmers and communities demonstrated.

**Michigan State University:**

The IPM Program collaborated with MSU Extension educators, researchers and specialists to address rising concerns with pest management in Michigan vegetable production, which is seventh in the nation and was valued at $463 million in 2012 (Census of Agriculture). Cover crops are being evaluated as a sustainable practice for reducing disease, weed, insect and nematode pressure in a number of vegetable crops including asparagus, carrots and squash. Information from these studies was disseminated through demonstrations, field days, workshops, news articles, a journal article (Journal of Nematology) and a video.

**University of Minnesota:**

**New Initiative in 2016: “MN Pollinator Health and Crop Protection Task Force”**

The MN legislature, beekeepers and MN citizens are increasingly aware of, and concerned about the decline in honey bee populations, as well as the overall health and impact of native pollinators, and their relationship to production agriculture. In response to these concerns, Governor Dayton held a press conference on Aug. 25, 2016, to announce his Executive Order and action items, to protect pollinators in the state. A key element of the Governor’s EO, is that MDA will require farmer’s to show a “justification of need”, before applying an insecticide, for example for soybean aphid. There are additional discussions about the use of insecticidal seed treatments on crops in MN, encompassing a total of 8 Action Items.

In response to the Governor’s plan, subsequent requests by the Pesticide Division of the MDA, and the MDA’s discussion about potential new regulations for MN farmers, the MN IPM Program initiated two activities: a) increased communication with the MDA on each of these topics, including a meeting held in early October at MDA, and b) the establishment of a MN Pollinator task force. The first meeting of the Task Force was held Dec. 8, 2016. A multi-disciplinary task force has been assembled, and the team is pursuing three broad initiatives, including: a) Landscape-based ecological risk assessment (ERA), to better understand probabilities of neonic residues and pollinator exposure under MN conditions, at planting, and mid-season (flowering) of key crops (to complement the EPA’s ERA), b) use the ERA to determine key research gaps, for future funding support and research, and c) expand the extension/outreach effort to provide guidelines to growers, crop consultants and beekeepers, to help mitigate the risk of bee/pollinator exposure to insecticide drift. In addition, as part of the Extension effort, we will encourage more growers, pesticide applicators and beekeepers to participate in the voluntary *“Driftwatch*” program, and register their locations on-line. This will lead to improved communication among all parties.

**University of Missouri:**

***Curriculum Development for Urban Landscapes:***  In September 2016, the pocket-sized guide IPM1035: Pest Management for Home Lawns was published. The manual contains descriptions and photos to aid in identification of turfgrasses and the most common lawn weeds, diseases, and insects in Missouri. In addition, the manual emphasizes IPM principles in pest management including target audience is individual homeowners, municipalities or lawn care businesses who can utilize the publication to train their staff or in communication with their clientele. In total, there are ~ 700 lawn care businesses, and 180 municipalities that could benefit from the resource, and since release over 300 guides have been purchased. This guide serves as an integral piece of the curriculum to our successful Lawn Care Workshop Series, which we hold 2-3 times a year in larger metropolitan areas such as Springfield, St. Louis and Kansas City.

**University of Nebraska-Lincoln:**

Nebraska Extension Issue Teams were developed after extensive stakeholder input on priority needs. A total of 18 teams; comprised of Extension Specialists and Educators across Nebraska were initiated; 2 with major IPM focus are

**Protect beneficial insect ecosystems including pollinators**

Current situation: Pollinators and beneficial insects are influenced by people’s practices in multiple environments; agriculture, public lands, and home landscapes. There is a need for education to promote use of pesticides within an IPM context, and adoption of practices that encourage pollinators and beneficial insects.

**Adopt management strategies to deal with resistant and invasive pests;**

Current situation: Resistant and invasive pest problems are not new but have regained prominence with an increase in weed resistance to several herbicides, resistance of corn rootworms to Bt corn hybrids, and invasive pests such as emerald ash borer, invasive rangeland and pasture weeds such as cheatgrass, and invasive pathogens such as bacterial leaf streak disease of corn.

Developed new website (http://cropwatch.unl.edu/resistance-management) to organize Nebraska Extension resources relative to resistance issues at one site

**North Dakota State University:**

Each year, insects and diseases attack North Dakota’s crops, potentially causing large losses in yield and quality. Crop producers, consultants, and other agricultural industry stakeholders need up-to-date information on pest occurrence, distribution and severity so that informed, timely, environmentally sound and economically justified management decisions can be made. In 2016, six NDSU field scouts were trained and operated out of the NDSU campus in Fargo, and the Research Extension Centers located in Carrington, Dickinson, Langdon, Minot and Williston. Field scouts surveyed for insects and diseases in four major crops: wheat (817 fields), soybean (488 fields), sunflower (208 fields + 10 static insect traps sites) and barley (115 fields). Pest data was submitted weekly to the Extension Entomologist, and weekly pest occurrence, frequency and severity maps were created. Maps were disseminated through the NDSU IPM Website and through the weekly NDSU Extension Service *Crop & Pest Report*.

**The Ohio State University:**

Conducted a Spotted Wing Drosophila identification and management workshop for 20 small fruit growers; trained 27 new and beginner growers at one day high tunnel workshop on current and emerging pest management topics; conducted herbicide drift injury workshop for 20 people; held a pumpkin field day focused on disease management for 33 growers; trained 4 people on IPM basics of Urban Agriculture systems; conducted a full day train-the-trainer workshop on Ornamental Plant and Turfgrass Diseases and Insects for 15 Extension educators and program assistants; held three soybean production workshops for 49 farmers on soybean cyst nematode, insect identification, and seed treatment; co-sponsored and resourced Central Ohio Bed Bug Task Force Summit attended by 117 people from a variety of Departments, associations, and businesses; processed 773 samples for businesses and homeowners in the C.Wayne Ellett plant and pest diagnostic clinic.

**South Dakota State University:**

The South Dakota IPM program along with the SDSU WEEDS Project and South Dakota Department of Ag embarked of an enhanced noxious weed educational program in 2014. The purpose of the program was to make more people aware of the problem and educate them on all the possible controls. Materials were updated and enhanced such as factsheets, South Dakota weed ID book, Pocket ID guides, spot treatments materials cards, Bio controls pocket guide, Test plot data results guide all to help farmers on the possible control programs. Demonstration plots were added on options for control. Additional Bio control programs were started along with material on past successes. Farmer meetings were added to discuss programs. Radio and news prints ads were increased scope and coverage.

**University of Wisconsin:**

Most of Wisconsin’s grain, alfalfa and specialty crops receive at least one pesticide application as part of an IPM strategy, with commercial pesticide applicators treating a significant portion of that acreage. Several agencies ensure these applicators are well trained. Wisconsin’s Pesticide Applicator Training Program provides new and existing applicators with training on safe and proper use of pesticides. Wisconsin’s Department of Agriculture, Trade and Consumer Protection (WDATCP) is responsible for certifying applicator knowledge, with particular emphasis on applicator safety and legal issues. Since 2006, the UW-IPM Program has been providing hands-on training in the application equipment they would be operating through its Custom Applicator Program (CAP), thus filling a training void aimed at reducing pesticide mishaps while providing some basic IPM training to what is often considered the last line of defense, the applicator, in a pest management scenario.

**Impacts**

**Purdue University:**

2016 Crop Management Workshops (CMWs), all-day, winter IPM and agronomic meetings, held in different locations of the state had 905 in attendance. Nearly 40% of the participants indicated that they make or influence pest management decisions on 10,000 or more acres and 69% of the attendees monitored customer fields at least once per month. 92% indicated they would use the information presented for the upcoming growing season while 73% have already implemented crop production/IPM strategies into their operation from ideas that originated at past CMWs. Participants highly rated the educational value of the meetings as the following evaluation values indicate: 92 percent of those attending said they would apply the information on pest identification and treatment decisions to next season’s crops and 90% of the participants indicated they would share what they learned with co-workers and/or customers. Concerning their “bottom line,” 94% said that it was worth both their time and money to attend the workshop. Of the participants that attended the previous year’s Crop Management Workshop, 80% of participants stated the recommended guidelines were followed during the season.

**Iowa State University:**

Integrated Crop Management (ICM) Conference is two-day, winter IPM and agronomic meeting held annually in late November/early December in Ames, IA. Approximately 940 agronomists and farmers attended the 2016 meeting. A total of 45 workshops covering crop production, crop protection and soil and water management were offered. Seventy four percent of participants rated the selection of topics as very good to excellent and 76 percent rated the quality of presentations as very good to excellent. As a result of attending the conference, two thirds of those attending estimated more than a $5 per acre increase in profits to their or their customer’s operation based on information from the conference, and 15 percent estimated more than a $10 per acre increase in profits. Some of the comments received include:

“I thought that the presentations on resistance management were very good.”

“Liked the multiple topics, as always, to choose from. New topics of interest as hot spots occur every year (diseases weeds insects).”

“Good, timely topics and knowledgeable speakers”

**Kansas State University:**

**Michigan State University:**

Our IPM program is providing vegetable producers with sustainable alternatives using cover crops within a framework of integrated pest management. We produced a video on mustard cover crops for biofumigation (https://youtu.be/jePUyzjXlmw) that has been viewed over 1,200 times. We also hosted eight breakfast meetings for vegetable crop consultants who scout a combined 3,000 acres. These meetings featured IPM discussions on diseases, insects, nematodes, weeds and resistance. Of survey respondents (n=46), 93% said they used information from at least one breakfast to advise their clients. A survey of 150 participants at another event, the 2016 Asparagus Field Day, found that 80% (n=35) responded positively to the question “Did you learn anything today that you, or your clients, will use in 2016 to increase yield or quality of asparagus?” At the Bay Area Vegetable Grower Meeting, cover crops for weed control in vegetables was presented to 41 growers and 14 other participants. For this session, 42% (n=12) of respondents said they would use the information on their farm or to advise their clients. We also presented research on cover crops and nematodes at the Great Lakes Fruit, Vegetable and Farm Market Expo to 40 participants. Only four responded to the survey, but all said yes to “Did you learn anything that you can apply on your farm next year?”

**University of Missouri:**

***Missouri IPM website:*** In 2016, the website received 307,037 page views during 110,666 sessions. This represents a 121% increase in page views over the previous year, and is 57 k more page views than 2014 and 2015 combined. The overall number of users increased 66% from nearly 50 k users in 2015 to 82,604 in 2016. Website information reached a broad audience with all 50 states accessing the site, with 45% of web traffic originating from within MO, followed by IL (7%), TX, and KS (both at 2.5%).

**University of Nebraska:**

2016 Nebraska Independent Crop Consultants meeting

77% increased knowledge of insect resistance management practices

59% will change or adopt new resistance management recommendations

41% will change corn rootworm management practices

46% will change western bean cutworm management practices

Resistance management workshops for western corn rootworm, Northeast Nebraska

522 participants at 11 sessions.

91% improved their knowledge of WCR biology and management

76% plan to adopt practices to prevent WCR resistance on their farms

Average knowledge gained valued at $6.21/A

**North Dakota State University:**

IPM articles published in the *Crop & Pest Report* often related directly to what was being discovered in the field as the IPM Crop Survey progressed through the season and scouts turned in their data. This provided near real time updates to stakeholders. As examples, timely information obtained by the field scouts was critical in updating our producers and agricultural professionals throughout the state about the early arrival of stripe rust in small grain crops. Soybean aphid populations were sub-economic, reducing insecticide inputs for soybean aphid management. Insect trapping provided early detection and tracked seasonal activity of banded sunflower moth and sunflower head moth.

 A survey administered through the *Crop & Pest Report* to assess the impacts of the IPM Crop Survey garnered 705 respondents either farming or with consulting responsibility for over 5 million acres. Respondents agreed or strongly agreed with the following:

90.1% of respondents found pest identification articles and images useful

80.3% used the weekly maps generated from IPM Crop Survey data

84.3% found articles on pest scouting useful

82.9% found articles on economic thresholds useful

80% relied on NDSU’s pesticide recommendations, guides and other NDSU Extension resources for managing pests

A Google Analytics analysis of web traffic on the NDSU IPM website and the NDSU *Crop & Pest Report* webpage between March 1, 2016 and March 1, 2017 revealed:

The NDSU IPM website received 999 visits from 11 countries, with visits resulting in 4,511 page views. 38.3% of users were new visitors to the site.

The NDSU *Crop & Pest Report* webpage received 102,289 visits from 149 countries!. Those visits resulted in 184,769 page views and 74.6% of users were new visitors to the website.

**The Ohio State University:**

In an effort to re-establish and maintain contacts with agronomic and specialty crop producers, OSU has developed an intern scouting program called Agricultural Crop Research and Extension (ACRE). The goal of this program is to train eight college student interns to assist Department specialists in a variety of research and outreach related tasks in eight multi-county regions across the state. Impacts from this program include 15 state-wide research and extension projects supported, 66 county based field trials supported, 32,000 agronomic and specialty crop acres scouted or researched during 600 farm visits during the 2016 season.

**South Dakota State University:**

The South Dakota IPM program has been the driving force behind this process to educate farmers to look at a whole farm approach to noxious weed control and realize control in the wet areas and fence lines and tree belts is just as important as it is in the fields and pastures. South Dakota Department of Ag each year surveys the state by county reports of noxious weeds in each county. This hit a record high of 2,046,000 acres in 2015. In 2016 we are starting to see the tide turn as acres decreased to 2,028,000. This is small decrease but if we look at 2014 there was 1,755,000 acres reported just to stop the increase is a big success.

**University of Wisconsin:**

***Crop Consultants*:** The Wisconsin IPM Program evaluated the Pest Management Update meetings which consisted of 7 regional meetings. This program was a cooperative effort between UW Extension faculty and IPM Program staff.

Evaluation results: 354 people attend and 237 responded to our survey. Respondents were a mix of several groups including crop consultants (45%), agribusiness (39%). Other groups included cooperative extension agents, government agencies, technical college instructors and producers. 157 participants were Certified Crop Advisers who collectively received 471 hours of Pest Management Continuing Education Units.

Most 2016 attendees (72%) also attended the 2015 program. 90% of respondents found the material appropriate and covered the type of information they expected, 98% of the respondents indicated they thought the information was unbiased and valuable (100%). 71% of the responded indicated this was a unique training opportunity and they could not get this information elsewhere. 100% indicated this was a valuable use of their time and 95% indicated the information provided will affect their management decisions in 2017.

Of those participants (87%) who indicated this meeting positively affected their management decisions and/or recommendations respondents indicated that we reached 13,600 farms and the value of our information was $38.7 million saved or earned ($10.90/acre).