



**IR-4 NORTH
CENTRAL REGION
RESEARCH CENTER**

MICHIGAN STATE UNIVERSITY



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2014 ANNUAL REPORT

A. Mission and Goals of the North Central Region IR-4 Program

The mission of the NC Region IR-4 program is to ensure that safe and effective pest management tools are available for growers of specialty crops, including ornamental crops, and for minor uses on major crops through the generation of high quality field and laboratory data.

The goals of the program are to identify pest management needs for these crops in the region, to participate in the prioritization of these needs at the national level, to conduct field research and analytical studies that develop the information to obtain clearances and label additions from USEPA to meet these needs, and, finally, to make information available on the status and progress of these studies and their final outcome to growers and other interested parties.

B. Background and Justification

The IR-4 Minor/Specialty Crop Pest Management Project (IR-4 Project) is a comprehensive, national program that consists of six units working together on a common mission to meet the nationally defined goals and objectives presented above. The national program is currently comprised of: IR-4 National Headquarters (IR-4 HQ), four Regional IR-4 Centers (Northeast, North Central, Southern and Western), and the USDA Agricultural Research Service (USDA-ARS) Office of Minor Uses. The North Central Region (NCR) program is responsible for the operations of the program in the 12 states of the region (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD and WI) and has been located at Michigan State University (MSU) since the inception of the regional programs in 1967. The NCR program, while located at MSU, has developed three field research centers in Michigan and Wisconsin, and works with other field research cooperators around the region, has established an advanced laboratory unit at MSU, and, in response to the Good Laboratory Practice (GLP) requirements of EPA, has developed a group of Quality Assurance personnel to serve the region. The NC program also works co-operatively with the USDA-ARS IR-4 field research unit located at Wooster, OH. Each of the 12 states of the Region (with the current exception of Missouri) has one or more State Liaison Representatives who identify research needs in their state and transmit back the activities of the program to interested parties within their state.

In the NCR program, needs are identified and prioritized by research and extension personnel, farmers, grower organizations and others at a regional meeting, and prioritized at a National Food Use Workshop. Field trials in which pest management chemicals are applied to food crops are conducted and crop samples are collected and analyzed for the magnitude of residues. All food use research is

conducted under the requirements for Good Laboratory Practice issued by the USEPA. The analytical reports, after Quality Assurance checks, are forwarded to USEPA as petitions for the development of clearances for these materials. Efficacy (performance) studies on key pests that are currently difficult to control are also funded where this is deemed necessary to obtain later clearances for these pests. Like food uses, ornamental projects are prioritized at a specific workshop and assigned to collaborators in the NCR. The ornamentals projects focus on efficacy and crop safety (phytotoxicity) with primary emphasis on pests for which no satisfactory controls currently exist. The reports are sent to the registrants of the chemicals to assist in obtaining label amendments to include new crops and pests. Proposals to conduct research and efficacy demonstrations with biopesticides are also solicited nationally and prioritized by an expert panel.

The plant protection industry has little economic incentive to conduct the research necessary to obtain registrations for most specialty crops. To fill this pest management gap, IR-4 develops the data that provide legal, effective, safe and IPM-compatible pest control agents. Without this program, many specialty crops could no longer be produced in the USA with severe economic implications for American agriculture, food processors, and consumers. Specialty crop growers and food processors are the primary beneficiary of the IR-4 Project by having legal access to effective pest management products, but the general public also benefits by having a safe, healthy, and reasonably priced food supply.

C. Budget

Funding for the NCR IR-4 program comes primarily from USDA/NIFA as an annual competitive research grant. We received \$1,957,506.00 for FY14. This is an increase of \$17,333 compared to FY13. The starting date for the FY14 funding was August 1st.

D. Overview of Productivity in 2014

This was another good year for laboratory productivity with the residue results from 96 trials completed and submitted to HQ. In quite a few cases these were high priority projects with critical deadlines that were all met. There is reason to be pleased with both the quality and quantity of productivity of this unit. A total of 87 food use reports were submitted for the region. In the ornamentals program, a total of 5 studies of pesticide efficacy and crop safety were submitted from the region. A downward trend of trial completions is reflective of fewer project assignments for NCR, however the costs of completion are on the rise because of expanding demands on trial samples (i.e. more decline studies) and greater analytical complexity of test substances. The two EPA compliance inspections conducted in 2012 were closed on February 8, 2013 without adverse findings. This illustrates the continuing effectiveness of the regional Quality Assurance program. More details of these results are provided below.

E. Future Challenges

The IR-4 program faces several challenges in the coming year. In view of continued focus on budget deficits in government spending, it is hard to be highly optimistic about increasing our current funding level from USDA, but so far we have not suffered significant reductions. Inflation and the need to replace expensive analytical equipment slowly decrease our capacity under this scenario.

Additionally, the deadlines for finishing residue analytical work have become shorter and much more critical. EPA now insists that all tolerance requests for a given pesticide must be bundled together for consideration rather than submitted piecemeal as in the past. If a study misses this bundling deadline, it may be several years before it can be included in the next package submitted to the agency. Also, agrichemical companies are increasingly reluctant to submit petitions to EPA more often than necessary since these can trigger new and expensive data requirements by EPA. These trends make it critical that analytical deadlines should not be missed. If they are, the delays will likely result in disappointment to

growers who are expecting to be able to use the new pesticide, unhappiness and decreased cooperation with IR-4 in the agrochemical industry, and, for the IR-4 lab involved, a black mark within the national program. So far we have adapted quite well to these added pressures but the margin for error is sometimes small.

It is also worth noting that while the rate of innovation in the form of new active ingredients introduced by the agrochemical industry has slowed, losses of older compounds through regulatory action and resistance continues. Down the road this may provide challenges both for growers and for IR-4.

On the brighter side, the productivity of the program remains high, grower support is strong, the very effective collaboration with the Canadian IR-4 program has been recognized by an invitation to participate in the joint US-Canadian Regulatory Cooperation Council (RCC), and IR-4 is taking a leading role in encouraging harmonization and more efficient data use at the international level including the sponsorship of a second Minor Crop “summit” Very few programs can claim such a comparable continuity of support and significance over half a century. IR-4 successfully received FAO funding to participate in Capacity Building efforts in SE Asia, with hopes that this will aid in harmonizing MRLs and in turn enhance global trade opportunities of US Specialty Crop producers.

F. Personnel Changes/Additions in 2014

John Wise, Entomology, MSU became Director of IR-4 North Central Region effective July 1, 2014. Bob Hollingworth, Director Emeritus, remains as Associate Director until July 2015. We thank Bob for his dedicated contributions to the IR-4 Project for more than quarter centuries and welcome John. More details are found in the IR-4 Newsletter. Vol. 45 No. 2 Spring 2014.

Brian Bowman resigned his position on June 21, 2014 after 4-year services at MSU IR4. Brian mainly worked in MSU Analytical Lab and conducted analytical phase inspections, analytical raw data audits, analytical summary reports audits, and draft final report audits, plus other duties. **Lisa Latham replaced Brian Bowman effective October 1, 2014.**

G. Regional IR-4 Activities:

Field Research

Food Uses: As a result of the **2014** NC Regional IR-4 Advisory Committee Meeting in East Lansing, MI, the subsequent IR-4 Food Use Workshop, and the National Research Planning Meeting, 76 food use field studies (68 GLP residue trials and 8 Efficacy/Crop safety studies) were assigned in 2014 while 91 field studies (85 GLP and 6 Efficacy/Crop safety) were conducted in 2013 (down 16%). The decrease in new trials this year is due to many repeat trials (red A projects) in 2013 resulting from unusual spring weather in Michigan in 2012. Ten tree fruit trials were lost to frost. In calendar year 2014 the region completed and sent to IR-4 HQ field data packages for 95 food use field trials (87 GLP trials and 8 Efficacy/Crop safety trials). See Table 4 of this report for the distribution and status of funded 2014 field research projects as of December 31, 2014. The 2014 projects will be completed by the end of the 2015 first quarter. Fig. 1 provides a graph of all projects completed for the 2005-2014 period as a 3-year moving average (food, ornamentals and lab) as of 12/31/14.

Ornamental Horticulture: Significant changes have been made nationally in the IR-4 Ornamental Horticulture program that brings with it an enhanced focus on efficacy research based on key pests and needs (as determined at the Ornamentals Workshop). In the ornamentals program in 2014, **23** studies of pesticide efficacy and crop safety were completed and the reports were forwarded to IR-4 HQ.

The remaining 86 studies are still in progress and will be completed in 2015. The following scientists (Table 1) participated in the program.

Table 1. Ornamental Research Projects in the NC Region in 2014

PROJECT	STATE	COOPERATOR
Thrips Efficacy Screen	MI	Terry Davis, Michigan State University
New Insecticide/Miticide Crop Safety	MI	Terry Davis, Michigan State University
Leaf Spots & Anthracnose Efficacy	MI	Mary Hausbeck, Michigan State University
New Disease Products Crop Safety – Foliar	MI	Mary Hausbeck, Michigan State University
New Disease Products Crop Safety – Foliar	MI	Willie Kirk, Michigan State University
Pre-emergent Herbicide Crop Safety	OH	Doug Doohan, Ohio State University
Ornament Grasses Herbicide Crop Safety	OH	Doug Doohan, Ohio State University
New Insecticide/Miticide Crop Safety	OH	Anand Persad, Davey Tree Experts Co. Ltd
Pre-emergent Herbicide Crop Safety	OH	John Siefer, Davey Tree Experts Co. Ltd
Pre-emergent Herbicide Crop Safety	IA	Daina Cochran, Iowa State University
Ornament Grasses Herbicide Crop Safety	IA	Diana Cochran, Iowa State University
New Disease Products Crop Safety – Foliar	OH	Francesca Hand, Ohio State University
New Insecticide/Miticide Crop Safety	KS	Ray Cloyd, Kansas State University

Biopesticides: In 2014, the NCR conducted the following biopesticide projects (Table 2). These projects seek to advance the registration and demonstrate the efficacy of naturally occurring pest management agents. These materials often have particular importance for organic growers.

Table 2. Biopesticide Research Projects in the NC Region in 2014

Title	Principal Investigator
Integrating Biopesticides into Soilborne Disease Control for 2-year old Ginseng	Mary Hausbeck, Michigan State University
US Efficacy Trials for the Turf Bioherbicide Sarritor	Steven Hallett, Purdue University

Canadian Biopesticides and Minor Use Pesticides Priority Setting Workshops: Satoru Miyazaki (plus Jerry Baron, Dan Kunkel and Edith Lurvey) participated in the 2014 Canadian Biopesticides and Minor Use Pesticides Priority Setting Workshops, which took place from March 25th to the 27th at the Hilton Lac-Leamy Hotel, 3 Boulevard du Casino, Gatineau, Quebec. From IR-4, Jerry Baron, Dan Kunkel and Edith Lurvey were also present. About 200 people attended. Much of the NC Region is contiguous with Canada and we have many pest management problems in common. These workshops facilitated the prioritization of biopesticides and minor use pesticides projects for the 2014 field season. The Canadian minor use priority rankings are set in each separate pest category (weeds, insects and diseases) for biopesticides, food, ornamentals uses, forestry and organic crops together. The pest priority is ranked nationally with the final decision being made by consensus. The final pest control solution for research is chosen from the list of potential solutions (conventional pesticides and other alternatives). IR-4 was also asked for input to assist in reaching a final determination, as needed. They prefer registration candidate products to be developed jointly with IR-4.

Interactions with Wisconsin Ginseng Growers: The NCR is home to a unique specialty crop, ginseng. Marathon County, Wisconsin, produces 90% of the cultivated American ginseng grown in the United States. To date through IR-4 13 fungicides are labeled for ginseng since the research started in 2002. On-going ginseng research includes seven fungicides and one molluscicide (metaldehyde).

On March 22, 2014, along with MSU's Mary Hausbeck, Department of Plant, Soil and Microbial Sciences and Johannes Corley, IR-4HQ, Satoru Miyazaki attended the 2014 Spring Wisconsin Ginseng Growers' meeting to present ginseng research results as well as provide information on the petition status of fungicides for ginseng. The ginseng growers are awaiting new labels for ginseng disease control and are very active in getting the word out to the Wisconsin federal and state legislators.

The 2014 Ginseng Research Field Day was held on August 8 in Marathon County, Wisconsin. Over 100 growers, industry representatives, policy makers, and researchers were in attendance. Mary Hausbeck and her staff highlighted the ongoing research trials in the various ginseng gardens of the cooperating growers. Satoru Miyazaki presented a progress report of the IR-4 ginseng research on new product registrations. Russ Groves, Department of Entomology, University of Wisconsin, talked about identification and management guide for pests of ginseng in Wisconsin. Mary Hausbeck showed the evaluation results of various new and experimental products for control of ginseng diseases. They could see and hold the infected samples and learned the most important aspect of having a healthy ginseng crop for their gardens.

Great Lakes Fruit, Vegetable and Farm Market Expo, Grand Rapids, MI, December 9-11, 2014:

The NCR IR-4 program joined the MSU AgBioResearch and Extension as exhibitor at the Great Lakes Expo to promote and publicize the IR-4 Project to fruit and vegetable growers, farm marketers and greenhouse operators. With the cooperation of IR-4HQ, a poster was set up depicting how the IR-4 project helps specialty crop growers with emphasis on Michigan and other NCR crops. The IR-4 brochure, "How IR-4 Helps Michigan Growers" was well received.

IR-4 Laboratory

Laboratory Performance: The Michigan State University lab was assigned analytical responsibility for 114 residue trials from US and Canadian sites in the 2014 National Planning Meeting. As shown in Fig. 1, the laboratory productivity in terms of trials completed and reported to the IR-4 Headquarters has slipped from previous years with 73 trials reported in 10 analytical summary reports and an additional 22 trials analyzed that are in the final stages of completion. While no additional major instrumentation

had been purchased in 2014, the lab has completed a lease for a new HPLC triple-quadrupole to be installed in February 2015.

International Activities: The laboratory continues to receive visits from international groups interested in pesticide regulation and residue analysis. The lab has also assisted Headquarters in hosting scientists, joint discussions and developing interactions with China, through Dr. Jiang. We currently have Mr. Zhiyong Yang working with us for the next year as of the second week of August 2013. He will be working with Dr. Jiang to learn how we generate and document data under GLP regulatory guidelines. In addition, Dr. Jiang has traveled to Thailand and the Philippines to work with international laboratories and the IR4 headquarters building international laboratory capacity for residue analysis.

Quality Assurance Program

The Quality Assurance Unit (QAU) in 2014 monitored 77 field trials and 127 laboratory analytical trials that were conducted in the region including the USDA ARS facility at Wooster, OH. QAU conducted periodic in-life inspections of the GLP studies to assure the management that the study protocol and appropriate Standard Operation Procedures (SOPs) were followed in compliance with the EPA GLP standards (40 CFR 160), and audited the field data books, analytical raw data, analytical summary report, and draft final report of each study to assure the data quality and integrity for GLP compliance. As part of the GLP requirements, QAU also conducted facility inspections to assure that the personnel, equipment, and test facilities were properly set up and adequate for conducting the requested GLP studies.

The personnel in the QAU that were involved in NCR studies in 2014 are:

<u>Quality Assurance Officers</u>	<u>Area of Responsibility</u>
Dr. Zhongxiao Michael Chen	Regional QAU management, inspections, and audits
Mr. Brian Bowman	Inspections and audits (until June 21, 2014)
Ms. Lisa Latham	Inspections and audits (Since October 1, 2014)
Dr. Derek Killilea	ND/SD Field Sites
Dr. Bryan Jensen	UW-Madison IR-4 Research Center

QAU Performance in Last 4 Years: In 2013, the QAU performed a total of 192 inspections and audits (Table 1). This workload had steady increases since 2009 after the closure of the Cornell University analytical lab and now it seems to be leveled off after 2012. In 2014, the draft final report audits has been dropped considerably due to uncontrollable external reasons.

Table 1. Numbers of Quality Assurance Reports Accomplished in Last 5 Years

Inspections or Audits	2011	2012	2013	2014
Draft Final Report Audit	8	24	14	4
Analytical Raw Data & Report Audit	35	38	42	23
Field Data Book Audit	139	91	76	76
Lab and Field In-life Inspection	65	47	52	40
Facility Inspection	6	4	8	4
Total QA Reports	253	204	192	147

EPA Inspection: There was no EPA inspection in the region in 2014. Up to date, our region has received 25 EPA inspections in total. The latest two EPA inspections were conducted at NDSU, Fargo,

ND and UW-Madison, WI in 2012 and were closed on February 8, 2013 without findings. There are no compliance issues reported by EPA inspectors since 2000.

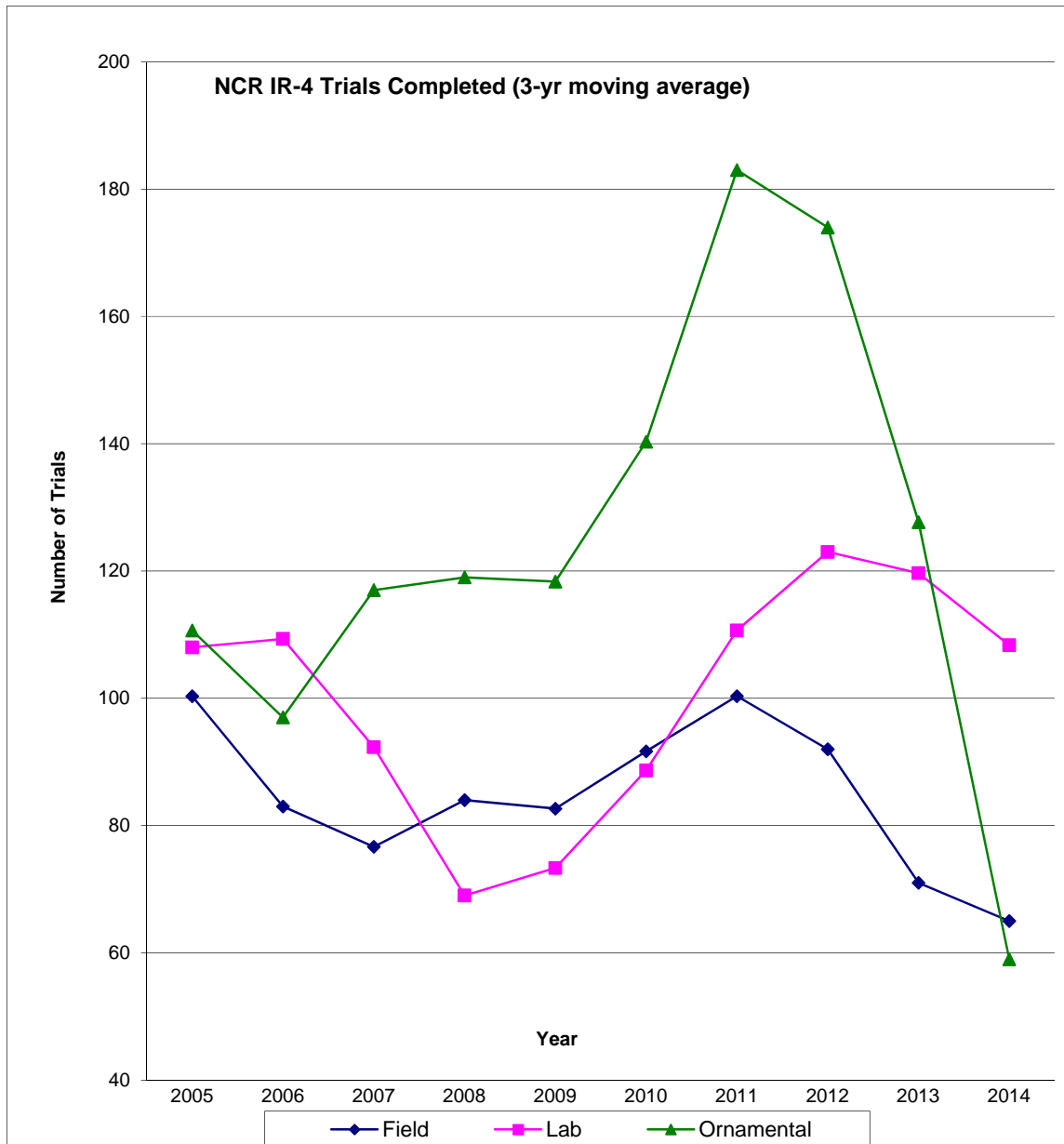
Personnel Change: Mr. Brian Bowman left the QAU on June 21, 2014 after 4-year services at MSU IR4. Brian mainly worked in MSU Analytical Lab and conducted analytical phase inspections, analytical raw data audits, analytical summary reports audits, and draft final report audits, plus other duties. Ms. Lisa Latham joined the NCR QAU on October 1, 2014.

Table 4. Distribution and Status of Funded 2014 Projects (Initiated/Completed*)

State	Food Use			Ornamental Use		
	Field	Efficacy	Lab	Fungicide	Herbicide	Insecticide
IL						
IN						
IA					14/0	
KS						6/0
MI	35/35	4/7	114/73	22/5		18/18
MN						
MO						
NE						
ND	8/19					
OH		1/0		5/0	25/0	1/0
SD	4/8					
WI	21/25	3/1				
TOTAL	68/87	8/8	114/73	27/5	39/0	25/18

*For 1/1/14 – 12/31/14. In some cases, the year of project initiation was not 2014.

Figure 1. Record of Project Completions in the NC Region*



*as of December 31, 2014

NCR State Researchers Participating in the IR-4 Program for 2014

(* indicates State Liaison Representative)

ILLINOIS D. Williams*	MICHIGAN S. Miyazaki* T. Davis M. Hausbeck	MINNESOTA V. Krischik *	OHIO D. Doohan* H. Mathers A. Persad J. Siefer F. Hand	WISCONSIN D. Heider* S. Chapman B. Jensen R. Groves*
INDIANA D.Egel*	A. VanWoerkom J. Wise B. Zandstra W. Kirk	NEBRASKA S. Kamble*	NORTH DAKOTA R. Zollinger* M. Ciernia B. Jenks	SOUTH DAKOTA S. Clay*
IOWA R. Hartzler* D. Cochran				
KANSAS R. Cloyd *	MISSOURI Open*			

NC Liaison Committee Officers

D. Williams - Chairperson
J. Wise - Vice Chairperson
S. Erhardt - Secretary

NC Region Administrative Advisor

D. Buhler - Administrative Advisor

MSU Leader Lab

J. Wise - NC Region Director
R. Hollingworth - Associate Director
S. Miyazaki - Regional Field Coordinator
S. Erhardt - Regional Lab Coordinator
W. Jiang - Associate Regional Lab Coordinator
L. Geissel - Research Assistant
S. Kumar - Research Assistant
E. Gomaa - Research Assistant
R. Fader - Laboratory Technologist
R. Othoudt - Part time Analyst
Z. Chen - QAU Coordinator
B. Bowman - QAU associate
L. Latham - QAU associate

Field Research Center Directors

MI: B. Zandstra (21 veg. and tree fruit crop use trials)
MI: A. VanWoerkom (17 tree fruit use trials)
WI: S. Chapman and D. Heider (15 veg. crop use trials).

Field QA

Z. Chen, MI
D. Killilea, ND
B. Jensen, WI