



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

MICHIGAN STATE UNIVERSITY



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2020 ANNUAL REPORT

(January 1 – December 31, 2020)

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. Projects to conduct research and efficacy demonstrations with biopesticides are also solicited and prioritized nationally at the annual Biopesticide Workshop.

The plant protection industry has limited 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 \$2,042,215 for FY20. The starting date for the FY20 funding was August 15, 2020.

D. Overview of Productivity in 2020

This was a productive year for the IR-4 North Central Region. Field Research Directors (FRD) effectively worked around weather-related events, such as frosts and flooding, to carry out field trials to completion. State and institutional restrictions related to the COVID19 pandemic challenged all aspects of work in the NCR, but because of outstanding efforts by all no trials were lost. Even with travel restrictions, the prioritization workshops were accomplished by utilizing virtual event platforms in 2020.

E. Future Challenges

The IR-4 program continues to face significant challenges in relation to the budgetary constraints on completing its mission. The continued flat funding in the NIFA grant will add continued pressures on the NC Region for maintaining its facilities, field and lab personnel, while providing the highest quality outputs for the specialty crop growers of the region.

While recent restructuring of the IR-4 Food, Biopesticide and Ornamental programs will reduce costs and help us balance budgets under flat NIFA funding, the trend of host universities demanding indirect costs (IDC) is yet another uncertainty for the sustainability of IR-4. In 2019, IR-4 moved its headquarters from Rutgers to NC State, in part because of excessive costs associated with remaining at Rutgers. With concern that other “host universities” may follow suit, IR-4 is taking action to shift our NIFA funding from a “special research grant” (not allowing IDC) to a “cooperative agreement” model (allowing up to 10% IDC).

F. Personnel Changes/Additions and Awards in 2020

NC Lab: Mr. Brad Arnold was hired and started in the laboratory in January of 2019. Ms. Diane Haddad was hired and started in July of 2019 in the laboratory as well.

NC Field: Allison Robinson was hired as a new technician in Doug Doohan’s lab at Ohio State University, replacing Chengsong Hu.

Awards: Dr. Cliff Sadoff was awarded the 2020 NCR Meritorious Service Award for conducting quality Environmental Horticulture field trials leading to registration of uses important for ornamental producers in the state and region. Lisa Latham was awarded the 2020 NCR Technical Service Award for her outstanding achievement implementing IR-4 Quality Assurance for the North Central Region and going above and beyond to assist in the first remote laboratory auditing process during the Covid-19 pandemic.

G. Regional IR-4 Activities:

Field Research

(Dr. Anthony VanWoerkom)

Food Uses: As a result of the 2020 NC Regional IR-4 Advisory Committee Meeting in East Lansing, MI, the subsequent IR-4 Food Use Workshop, and the National Research Planning Meeting followed by inevitable adjustments, 70 (68 NIFA funded) food use field studies (56 GLP food crop field residue trials and 14 efficacy/ crop safety studies) were assigned in 2020. See Table 1 of this report for the distribution of the funded 2020 field research projects and the projects completed during this period.

Table 1. 2020 NCR FOOD GLP AND EFFICACY/CROP SAFETY PROJECTS

2019 Studies	FRD
8 GLP	Chapman, Scott (WI)
6 GLP	Doohan, D. (OH)
5 GLP	Hausbeck, Mary (MI)
7 E/CS	Hausbeck, Dr. Mary
9 GLP	Heider, Daniel J. (WI)
10 GLP	Reicks, Graig (SD)
3 E/CS	Reicks, Graig
1 GLP	Spotanski, Jess J. (NE)
4 GLP	Van Woerkom, Dr. Anthony (MI)
12 GLP	Zandstra, Dr. Bernard H. (MI)
4 E/CS	Zandstra, Dr. Bernard H.

Ornamental Horticulture: As a result of the 2019 Ornamentals Prioritization workshop, in 2020 NCR cooperators conducted 40 trials to assess the safety of pesticides on ornamental crops and 28 efficacy studies (may contain multiple trials each). The outcomes of these projects will help to deliver new pesticide registrations in ornamentals, expand registrant labeling through positive performance data, and enhance their adoption through demonstration of their effectiveness in controlling pests. See the Table 2 for details.

Table 2. 2020 NCR ORNAMENTAL HORTICULTURE PROJECTS

Project Title	Protocol	State	Cooperator
New Disease Products Crop Safety - Foliar (5)	20-011	IN	Beckerman
New Disease Products Crop Safety - Soil (2)	20-012	IN	Beckerman

Efficacy of Management Tools for Non-oomycete Root Rots - Thielaviopsis (5)	20-007	IN	Beckerman
Efficacy of Management Tools for Non-oomycete Root Rots - Rhizoctonia (5)	20-008	IN	Beckerman
Pythium Efficacy (6)	20-006	MI	Hausbeck
New Disease Products Crop Safety- Foliar (5)	20-011	MI	Hausbeck
BioFungicides for Powdery Mildew Efficacy (6)	20-015	MI	Hausbeck
Pre-emergent Herbicide Crop Safety (In Season) (12)	20-013	OH	Mathers
New Disease Products Crop Safety - Soil (2)	20-012	MI	Marisol
Pythium Efficacy (6)	20-006	OH	Hand
New Disease Products Crop Safety- Foliar (4)	20-011	OH	Hand
SOR Regional Post-emergent Herbicide Crop Safety (In Season) (5)	20-022	OH	Doohan
New Pest Products Crop Safety - Foliar (5)	20-005	IA	Currey

Integrated Solutions: As a result of the 2019 Integrated Solutions Prioritization Workshop, in 2020 NCR cooperators conducted 3 Integrated Solutions projects. With the outcomes of these projects we expect to better service the needs of the IR-4 stakeholders by integrating products. It will take advantage of the considerable increase in development of efficacious biopesticides that are increasingly playing a more significant role in both conventional and organic agricultural production systems.

Table 4: Integrated Solutions Projects in the NC Region in 2020

Title	Principal Investigator
Bitter Rot (Colletotrichum spp) / Apple	Janna Beckerman, Purdue University
Damping-off / Hemp(2019 carry over)	Burton Johnson, North Dakota State University
Downy mildew / Organic basil (2019 carry over)	Mary Hausbeck, Michigan State University

Outreach and Collaborative Activities:

Extension and outreach activities included increasing awareness of IR-4 to stakeholders through zoom calls, phone calls, and email. We gained several new IR-4 stakeholders that want to be involved for the North Central Region. We have received many positive feedbacks from valuable stakeholders that our efforts are very much appreciated.

Laboratory Program

(Dr. Susan Erhardt)

The laboratory was able to complete the analysis of over xx trials while reporting xx of these for a total of xx reports in 2020. Even with the changes in personnel, the emphasis continues to be reduce the backlog

of projects so that overall turnaround for projects comes more consistently closer to the 30 month

2020 Projects for NCR Laboratory at MSU

PR#	CHEMICAL	MATRIX
09520	FLUTOLANIL	BEET (GARDEN)
12902	FLUTOLANIL	CARROT
12634	SULFOSULFURON	TOMATO (PROCESSING)
12757	ABAMECTIN	BEET (SUGAR)
12675	EMAMECTIN BENZOATE	BEAN, LIMA (SUCCULENT)
08609	INDOXACARB	AVOCADO
10827	AZOXYSTROBIN	POMEGRANATE
10630	PERMETHRIN	DRAGON FRUIT (PITAYA)
12564	ABAMECTIN	MIRACLE FRUIT
12841	BENTAZON + ACIFLUORFEN	PEA (DRY)
12791	ACIFLUORFEN	BASIL

turnaround time where ever possible while maintaining data quality.

Quality Assurance Program

(Dr. Zhongxiao Michael Chen)

The Quality Assurance Unit (QAU) in 2020 monitored xx field trials and xx 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 2020 are:

Quality Assurance Officers

Dr. Zhongxiao Michael Chen
 Ms. Lisa Latham
 Ms. Eileen Nelson
 Ms. Stacy Gieck

Area of Responsibility

Regional QAU management, inspections, and audits
 Analytical Lab Inspections and audits
 UW-Madison IR-4 Research Center
 NE Field Site/Midwest Research Inc.

QAU Performance in Last 5 Years including current year: In 2020, the QAU performed a total of xx inspections and audits (Table 1). This included quite a few audits that our region helped HQ QAU in auditing draft final reports, analytical raw data and reports, and field data books. We also picked up a few field in-life inspections during the season to meet the overall inspection requirements nationwide when other regions encountered difficulties. QAU also provided the critical GLP trainings to personnel at OH field site when the field technician left the job in middle of the season and the new replacement was lacking of formal GLP training. Overall, 2020 was a productive and successful year and our QAU performed very well.

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

Inspections or Audits	2015	2016	2017	2018	2019
Draft Final Report Audit	14	9	16	15	17
Analytical Raw Data & Report Audit	33	34	34	40	26
Field Data Book Audit	74	117	76	78	99
Lab and Field In-life Inspection	63	59	56	52	37
Facility Inspection	10	6	5	6	5
Total QA Reports	194	225	187	190	184

EPA Inspection:

International Activities:

(Drs. Wayne Jiang and John Wise)

Dr. Wayne Jiang had been involved in USDA FAS funded international capacity building efforts in 2020. Dr. Jiang’s outreach efforts are related to the FAS grants, for which in 2020 he continued informal training (mostly online venues following COVID restrictions) to developing countries to help establish their capacities for the minor uses and registration programs; and trained international lab chemists with EPA and OECD GLP standards, as in Capacity Building, sponsored by USDA FAS, STDF, IR-4 Projects, and GMUF. He actively participating in USDA FAS Capacity Building Program, Tropical Fruit Studies are selected in ASEAN, North African, Central and South American countries. Wayne also traveled to Colombia in January 2020 on the USDA FAS’s Capacity Building mission.

NCR State Researchers Participating in the IR-4 Program for 2020

(* indicates State Liaison Representative)

ILLINOIS Open*	MICHIGAN M. Hausbeck J. Wise A. VanWoerkom	MINNESOTA A. Robinson*	OHIO D. Doohan* H. Mathers F. Hand Allison Robinson	WISCONSIN D. Heider* S. Chapman R. Groves*
INDIANA J. Beckerman S. Meyers	B. Zandstra E. Hotchkiss M. Quintanilla S. Chaudhari D. Saha	NEBRASKA A. Jhala*		
IOWA R. Hartzler*		NORTH DAKOTA Andy Robinson* B. Jenks	SOUTH DAKOTA S. Clay* G. Reicks	
KANSAS Open*	MISSOURI Reid Smeda*	INDEPENDENT CONTRACTORS J. Spotanski		

NC Liaison Committee Officers

G. Reicks - Chairperson
T. Van Woerkom - Vice Chairperson
W. Jiang - Secretary

NC Region Administrative Advisor

D. Buhler - Administrative Advisor

MSU Leader Lab

J. Wise - NC Region Director
A. VanWoerkom - Regional Field Coordinator
S. Erhardt - Regional Lab Coordinator
W. Jiang - Associate Regional Lab Coordinator
L. Geissel - Research Assistant
S. Kumar - Research Assistant
D. Haddad - Research Assistant
R. Fader - Laboratory Technologist
B. Arnold - Research Assistant
Z. Chen - QAU Coordinator
L. Latham - QAU associate

Field Research Center Directors

MI: B. Zandstra
MI: A. VanWoerkom
WI: S. Chapman and D. Heider

Field QA

Z. Chen, MI/L.Latham
D. Killilea, ND
E. Nelson, WI