



ISU Plant and Insect Diagnostic Clinic

2016 annual report



The Plant and Insect Diagnostic Clinic (PIDC) is an integral part of the ISU Integrated Pest Management Program (IPM) and the Departments of Horticulture, Agronomy, Entomology and Plant Pathology and Microbiology. We provide plant problem diagnosis, plant, weed, mushroom and insect identification. We process soil samples for soybean cyst nematodes and nematodes that feed on corn. We provide

diagnoses and unbiased IPM recommendations to landscape and turf grass commercial providers, pest management professionals, agribusiness professionals, growers and homeowners.

The clinic is part of the National Plant Diagnostic Network (NPDN, www.npdn.org), a network that aims to quickly detect and identify pests and pathogens of concern, and safeguard the health and productivity of agricultural and natural ecosystems in the U.S.



SAMPLE SUMMARY

The PIDC staff processed a total of 1675 samples in 2016. This number includes 336 corn samples screened for an emerging disease of corn, bacterial leaf streak.

Sample Type	Number of samples
Field crop - soil	553
Field crop - plant	527
Broadleaf trees	272
Coniferous trees	145
Fruit and Vegetables	76
Perennial and Annuals	39
Turfgrass	31
Plant ID	25
Mushroom ID	7

TYPES OF DIAGNOSES

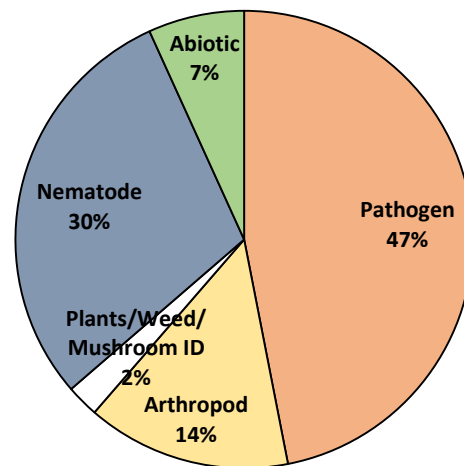


Table 11. Most frequent diagnosis by sample type.

Sample Type	Host	Pathoge/pest Scientific anme	Common name
Broadleaf Trees	Bur Oak	<i>Tubakia iowensis</i>	Bur Oak blight
	Ash (multiple)	<i>Agrilus planipennis</i>	EAB
	Oaks	<i>Ceratocystis fagacearum</i>	Oak Wilt
	Bur Oak	<i>Family Cynipidae</i>	Cynipd galls
	Ash	<i>Eriophyes fraxiniflora</i>	Eriophid mites
Coniferous Trees	Spruce	<i>Stigmia lautii</i>	Stigmia neddle cast
	Spruce	<i>Setomelanomma holmii</i>	SNEED
	Spruce	<i>Rhizosphaera sp./spp.</i>	Rhizosphaera needle cast
	Spruce	<i>Oligonychus ununguis</i>	Spider mites
	Pine	<i>Diplodia sapinea</i>	Diplodia tip blight
Field Crops	Field Corn	<i>Cercospora zeae-maydis</i>	Gray leaf spot
		<i>Puccinia sorghi</i>	Common rust
		<i>Exserohilum turcicum</i>	Northern corn leaf blight
		<i>Colletotrichum graminicola</i>	Anthracnose
	Soybean	<i>Xanthomonas vasicola vasculorum</i>	Bacterial leaf streak
		<i>Diaporthe phaseolorum sojae and spp</i>	Soybean pod and stem blight
		<i>Macrophomina phaseolina</i>	Charcoal rot
		<i>Fusarium sp./spp.</i>	Fusarium root rot
	<i>Colletotrichum destructivum</i>	Soybean anthracnose	
Insect ID	Domestic Dwellings	<i>Cimex lectularius</i>	Bed bug
	Insect Id Request	<i>Dermacentor variabilis</i>	American dog tick
		<i>Order Collembola</i>	Springtails



Diagnostic highlights

This was a molecular pathogen detection year in the Plant & Insect Diagnostic Clinic. Our plant disease diagnosticians Lina Rodriguez Salamanca and Ed Zaworski both succeeded in implementing and offering to our client's DNA-based diagnostic techniques for plant pathogens. Lina implemented a PCR test for *Ceratocystis fagacearum* (the pathogen that causes oak wilt), and Ed used PCR to confirm a new disease of corn – bacterial leaf streak caused by *Xanthomonas vasicola vasculorum*. The Plant & Insect Diagnostic Clinic (PIDC) processed samples for regulatory officials as part of a bacterial leaf streak survey in Iowa for the occurrence of this disease, and we were designated the Regional PCR Testing Laboratory for this disease for the North central region within the National Plant Diagnostic Network (NPDN, www.npdn.org). We confirmed Tar spot in corn in the state of Iowa.

Customer relations

The clinic staff responded 495 phone calls, and a total of 1111 email from costumers. Our two groups with the most email inquiries were Extension personnel (459), followed by Homeowners (441). Commercial producers/service providers and state agencies also contacted the clinic via email (191 and 20 email respectively).

The PICD staff also engaged with stakeholder via social media. Our Facebook page (<https://www.facebook.com/ISUPIDC/>) has 738 likes and the pages average yearly total reach was 122. Diagnosticianscian

PUBLICATIONS

Horticultural crops and trees

Horticulture & Home Pest News (ipm.iastate.edu/ipm/hortnews/). L. Jesse and L. Rodriguez-Salamanca wrote 11 diagnostic updates, 7 plant disease articles, 6 insect related articles, 2 mushroom articles and 1 general services article.

Category 3, Ornamental, Turf, and Greenhouse Pest Management -- Iowa Commercial Pesticide Applicator Manual. L. Rodriguez-Salamanca assisted with the update.

Category 3, Ornamental, Turf, and Greenhouse Pest Management -- Iowa Commercial Pesticide Applicator Resources for both 2015 and 2016. L. Rodriguez-Salamanca contributed 3 video recordings.

Master Gardener Resource Guide. L. Jesse and L. Rodriguez-Salamanca updated chapters for the 2016 edition of the Master Gardener Resource Guide.



Iowa High Tunnel Fruit and Vegetable Production Manual. Updated chapters. L. Rodriguez-Salamanca and L. Jesse.

Midwest Vegetable Production Guide 2017. Contributions from L. Rodriguez-Salamanca and L. Jesse

Midwest Fruit Pest Management Guide 2017. Contributed to the update. L. Rodriguez-Salamanca, L. Jesse.

Ticks and Tick-borne Diseases in Iowa. Update. H. Joel Hutcheson, Ken Holscher, James W. Mertins, Laura Jesse, Donald Lewis.

Scale Insects on Ornamental Landscape Plants. (Update) Donald Lewis, Mark Shour, Laura Jesse.

Crops

Four articles were posted on the Integrated Crop Management News as follows
Spring Seedling Sampling, Plant and Insect Diagnostic Clinic update 6/17/2016,
Plant and Insect Diagnostic Clinic update 7/7/2016, Tar Spot Confirmed in Corn in
Eastern Iowa.

Posters

Rodriguez-Salamanca, L.M., and Creswell, T, Expanding the impact of NPDP: Diagnostic Training in Colombia. NPDP 4th National meeting, Washington, DC March 8 – 12, 2016. Poster presentation.

Balbalian, C., Hale, F., Ruhl, G. Bec, S., Blunt, T., Byrne, J., Conner, K., French, J. Garzon, C., Iriarte, F., Jogi, A., Lamborn, J., Levy, L., May, S., O'Mara, J., Putnam, M., Rane, K., **Rodriguez-Salamanca, L. M.**, Shiel, P., Snover-Clift, K., Singh, R., and Thomas, C. The National Plant Diagnostic Network Diagnostics Program Area Committee. NPDP 4th National meeting, Washington, DC March 8 – 12, 2016. Poster presentation

Allen, J., McCarthy R., Hoenisch, R., Dobesh S., David Clement, G. Keith Douce, Hill, M., LaForest, J., Arenz, B., Olson J., **Rodriguez-Salamanca L.**, French R., Draper, M., Harmon, C. NPDP first detectors: new and updated resources for enhanced pest and pathogen Detection. The National Plant Diagnostic Network Training and education Program Area Committee. NPDP 4th National meeting, Washington, DC March 8 – 12, 2016. Poster presentation



Creswell, T., Harmon, C., Williamson, C., Wick, R., Marra, B., Hazelrigg, A., and **Rodriguez-Salamanca, L. M.**, Beyond 'National': The NPDN at Work Abroad. NPDN 4th National meeting, Washington, DC March 8 – 12, 2016. Poster presentation

OUTREACH VIDEOS

Horticultural crops and trees

- Rhizosphaera Needle Cast <https://www.youtube.com/watch?v=Bp-heSkQWIA>
- Collecting Tip and Needle Blight Samples <https://youtu.be/gdkL17Rlwlq>
- Collecting Mushroom Samples <https://youtu.be/C2uEawdisP8>
- Greenhouse- Properly Collecting and Packaging a Sample for Diagnosis <https://youtu.be/T3S2PZ8s8T8>
- Field- Collecting Whole Plants For Plant Problem Diagnosis <https://youtu.be/WcY71SSVM0M>
- Oak wilt-Special type of sample needed when testing for oak wilt <https://youtu.be/Fkgomb4pvsM>

Crops

- Sampling For Seedling Disease <https://youtu.be/X044yiE1ldU>

PRESENTATIONS

PIDC staff members are vital members of many programs on a variety of topics. This past year we gave the following presentations:

Horticultural crops and trees

Iowa Fruit and Vegetable Growers Conference: Plant problem diagnosis trivia

Annual Shade Tree Short Course: Diagnosing Problems of Woody Plants

Redefining Prison Environments: "Garden IPM: intro to plant diseases",

Morel identification workshop

Turfgrass field day: Turf IPM

Tomato production workshop: What to look for and how to confirm if it is a disease

Amish Produce program and Field Day (commercial vegetable production IPM updates: Vegetable IPM, managing diseases.



Iowa master gardener training: Plant pathology and IPM webinars and hand on training,

Master Woodland Managers, Common Insect Pests of Broadleaf and Conifer Trees

Building Owners and Managers Association, Insects all around us!

Horticulture conference call (professional development for extension horticulturalist state wide), PIDC staff lead discussion on recognizing the importance of sample background

Horticulture Extension in service, Plant and Insect Diagnostic Clinic Tour during the ANR-Annual Conference

Crops

Crop Scout School, Scouting for field crop diseases

Integrated Crops Management Conference, IPM 101

Wyffels Field Day, Corn pests, weed ID and scouting challenges

4-H Youth Conference, Plant pathology 101

Crops team fall in-service, PIDC Update

TEACHING ACTIVITIES

PIDC staff contribute to graduate and undergraduate education here at ISU by bringing our hands-on experience into the classroom.

Co-instructed

PLP 590, Extension Experience, summer semester (3 grad students), 4 sessions in the PID Clinic. Instructors: Daren Mueller, Alison Robertson, Greg Tylka, Laura Jesse, Lina Rodriguez-Salamanca

Guest lectures

HORT 332, Biological Control of Greenhouse Pests (Dr Jesse) Spring semester

HORT 471, Vegetable disease management. Spring semester (~30 students) 2 lectures and a PIDC tour. (Dr Jesse and Dr Rodriguez-Salamanca)

PLP 590, Extension experience, summer semester (3 grad students), 4 session at PIDC (Dr Jesse and Dr Rodriguez-Salamanca). Co- teach with Dr Mueller, Dr Robertson, Dr Tylka.



HORT 376, Disease management in horticultural crops. Fall semester (~20 students) 2 lectures. (Dr Jesse and Dr Rodriguez-Salamanca)

Micro 302, Introduction and history of Microbiology. Fall semester (105 students), 2 lectures (Dr Rodriguez-Salamanca).

COLLABERATION AND PERSONNEL

The Plant and Insect Diagnostic Clinic (PIDC) is an integral part of the ISU Integrated Pest Management Program (IPM) and the Departments of Horticulture, Agronomy, Entomology and Plant Pathology and Microbiology. The PIDC benefits realty form the extension specialist expertise.

Extension specialist that collaborated frequently on sample diagnostics:

<p>Agronomy Kendall Lamkey Robert Hartzler Mark Licht</p>	<p>Ecology and Evolution and Organismal Biology Deb Lewis</p>
<p>Entomology Sue Blodgett Donald Lewis Erin Hodgson Ken Holscher Mark Shour</p>	<p>Plant Pathology and Microbiology Thomas Baum Alison Robertson Daren Mueller Doug McNew Gary Munkvold Greg Tylka Leonor Leandro Mark Gleason Tom Harrington X.B. Yang</p>
<p>Horticulture Jeff Iles Ajay Nair Chris Currey Cindy Haynes Diane Cochran Adam Thoms Kathleen Delate Gail Nonnecke Nick Christians Richard Jauron</p>	<p>Natural Resource Ecology and Management Sue Blodgett Jesse Randall</p>

Special thanks to John VanDyk and Ann Greazel for IT assistance and to Jennifer Bungert and Brenda Downs clerical help.



Staff Updates

Laura Jesse Ph.D., Entomologist- Clinic director, celebrated her 9th anniversary as clinic director and 10th anniversary as entomology diagnostician

Lina Rodriguez-Salamanca Ph.D., Extension Plant Pathologist and Diagnostician for (Horticultural crops, tree and ornamentals) celebrated her 1st anniversary with the clinic on April 1, 2016

Ed Zaworski M.S., Plant pathologist Diagnostician for Field crops and conifers celebrated her 2nd anniversary with the clinic on November 17, 2016

Undergraduate and graduate assistants

Melissa Irizarry graduated from her master degree in spring 2016. Melissa moved to Florida where she is working on Ph.D degree. She assisted the clinic for 2 years with plant ID and plant problem diagnosis.

Caitlin Irwin graduated from her Microbiology degree and move to work for Monsanto after 2 years of assisting in the clinic. She did a wonderful job supporting every day laboratory task and clerical work at the clinic. She is a bright and motivated young scientist and we are sure she has a bright future.

Erika Johnson who help us processing soil samples moved on to work with Dr Chris Currey with the Department of Horticulture.

This fall we welcome three Undergrad assistance to the PIDC team. Grant Hughes (freshman, horticulture), Alexandra Benz (sophomore, Microbiology and genetics, Dean Leadership scholar award recipient), and Cristian Olmos (sophomore Microbiology, minor in food safety).