

# 2017 Annual Report for the North Dakota State University Extension Plant Diagnostic Lab

January 1 through December 31, 2017

Available on-line at <http://www.ag.ndsu.edu/pdl>

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**NDSU** College of Agriculture, Food  
Systems, and Natural Resources

NORTH DAKOTA STATE UNIVERSITY  
**NDSU Extension Service**

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## About the Lab

Since 1962, the NDSU Plant Diagnostic Lab has helped individuals and professionals in agriculture and horticulture identify plant pests, diseases, cultural and environmental problems. While the majority of our samples come from the local community, samples originated from 27 different states and Canada in 2017. Before submitting a sample to the NDSU Plant Diagnostic Lab, consider calling or emailing us. In many cases we are able to offer assistance without receiving a physical sample. In other instances, it might be necessary to aide in sample collection. For more information, please visit our webpage: <https://www.ag.ndsu.edu/pdl>

If you submit a sample to the NDSU Plant Diagnostic Lab for seed health testing or phytosanitary testing, a modest fee may apply to offset the costs of lab technicians and supplies. Routine diagnostic fees are waived for some services for some clients. Commercial entities are not exempt from fees; homeowners may be in the event that no third-party supplies are used and samples are not received in bulk. For more information, please refer to page 5 or contact the lab directly. Current fee rates for commonly requested services are available online at <https://www.ag.ndsu.edu/pdl/services-and-fees>. Other services not listed or bulk pricing may be available on request. We consider it our mission to serve the agricultural/horticultural/forestry community on all levels. Doing so requires a flexible and responsive work ethic.

## Personnel

The lab supports a lead diagnostician/director and up to three full-time support personnel. The lab also employs several hourly students at various times throughout the year. Lab technicians and hourly help (as well as supplies and equipment) are supported with funds generated by the lab. Since 2016, Jesse Ostrander (MS, Plant Pathology) is the current director of the lab and previously, plant diagnostician (since 2013). Aimee Thapa (BS, Horticulture) is the extension administrative assistant who supports the lab. Christine Ngoan (MS, Botany) joined the lab as the Seed Health Technician in 2017. Alex Knudson (MS, Entomology) is the acting entomological diagnostician. The assistant diagnostician position was vacant for all of 2017.

## National Plant Diagnostic Network and NPDN First Detector Training

The National Plant Diagnostic Network (NPDN) was established in 2002 and consists of five regions. The NDSU Plant Diagnostic Lab is a member of the Great Plains Diagnostic Network (GPDN), a 9-state region of the NPDN. The NPDN provides critical diagnostic training for plant diagnosticians around the country as well as a means of secure communication among plant diagnosticians and regulatory personnel if high risk plant pest threats occur. Its mission stresses the importance of early detection of pests that can negatively impact our agricultural, forestry, natural, or horticultural resources, and to this end the NPDN, via the NDSU PDL, offers NPDN First Detector training in North Dakota through face-to-face training events or online training.

NPDN website: <https://www.npdn.org/>

GPDN website: <https://www.npdn.org/gpdn>

**County extension agents:** For a programming idea for your county, consider offering NPDN First Detector training. Learn how by contacting the Plant Diagnostic Lab.

A registered **NPDN First Detector** is any individual in agriculture, horticulture, or forestry who has undergone NPDN First Detector training and who has volunteered to become registered with the NPDN. Professionals and master gardeners who are involved in some way with agriculture, forestry, or horticulture are especially encouraged to consider becoming registered NPDN First Detectors. *Self-directed training, via on-line training modules, is available at <http://firstdetector.org/>.* After successfully completing three or more of the online modules,

individuals may call the NDSU Plant Diagnostic Lab to become registered in the NPDN First Detector national database, although registration is optional/not required.

Face-to-face NPDN First Detector training is an option, and it may be possible to arrange a session near you if interest exists. Contact the lab if you would like to become a registered NPDN First Detector (phone: 701-231-7854; email: [jesse.ostrander@ndsu.edu](mailto:jesse.ostrander@ndsu.edu)).

## Activities of the NDSU Plant Diagnostic Lab

Our goal is to provide economical, unbiased plant and pest diagnostic services to agricultural professionals, the horticulture/turf/forestry industries, homeowners, and individuals in North Dakota. We can accept samples of plants, soil, and insects from throughout the United States including Alaska and Hawaii.

## 2017 Accomplishments and Highlights

- The lab once again processed a higher-than average number of samples in 2017.
- The lab maintained USDA certification to test for bacterial ring rot to fulfill requirements of the Canadian Seed Potato Certification Program, for seed destined to be sold as certified seed in Canada.
- We continued to support the Master Gardener program and other horticultural community programs.
- Christine Ngoan (MS, Botany) joined the lab as the Seed Health Technician this year.
- The lab expanded its seed health testing to include *Dickeya spp.* and PMTV/TRV screening services.
- In addition to offering routine diagnostic services, we continued to provide:
  - seed health testing for seed growers
  - phytosanitary testing to support the efforts of the North Dakota Department of Agriculture to facilitate exportation of ND crops
  - research support services for faculty and private entities

## Services and Fees

By nature we are flexible and adaptable, and it is not possible to list everything we can do. For a list of our most common services and their current fee rates, please visit our webpage at: <https://www.ag.ndsu.edu/pdl/services-and-fees> or contact us by phone. Please contact the lab (phone: 701.231.7854; email [jesse.ostrander@ndsu.edu](mailto:jesse.ostrander@ndsu.edu)) for information on special tests, bulk pricing, or research/survey support options not listed – **we are flexible and may be able to offer the services necessary to fulfill your needs.**

## Fee Waivers for Extension Personnel

The lab offers fee waivers for Extension Personnel. In 2017, samples referred (or submitted) to the lab by **Extension Personnel for non-commercial clients** usually qualified for a **fee waiver**. The purpose of these waivers is to help foster relationships between extension personnel and their stakeholders. These waivers were used to waive the following fees:

- routine diagnosis
- culture (including the Dutch elm disease culture test)
- herbicide injury evaluation (visual only; NDSU Plant Diagnostic Lab does not offer wet chemistry residue analysis)
- plant/insect/fungus identification

**Note:** The fee waiver cannot be applied to seed health/phytosanitary tests, the potato spindle tuber viroid test, DNA-based tests, most serological testing and certain other tests. If you have any questions, please contact the lab. Fee waivers and other information are typically distributed during the annual extension conference.

## Turn-Around Time

The NDSU PDL is a first-come first-serve lab, with some exceptions. Under certain circumstances, some samples, particularly commercial ones or those suspected to be infected by a 'high risk' pest (as defined by USDA-APHIS or the National Plant Diagnostic Network), may be given priority, especially if a very narrow window of time for treatment or response exists. While some of the samples are easily diagnosed the same day they are received, many samples have uncommon or unusual symptoms that are not routinely encountered by the diagnosticians or supporting experts. As a result, be prepared for longer turn-around times.

Actual turnaround times may vary, depending on complexity of the problem, availability of expert consultants, types of tests needed, number of tests needed, number of samples, knowledge of the crop, type of problem suspected, priority, availability of reagents, availability of PDL staff, and so on.

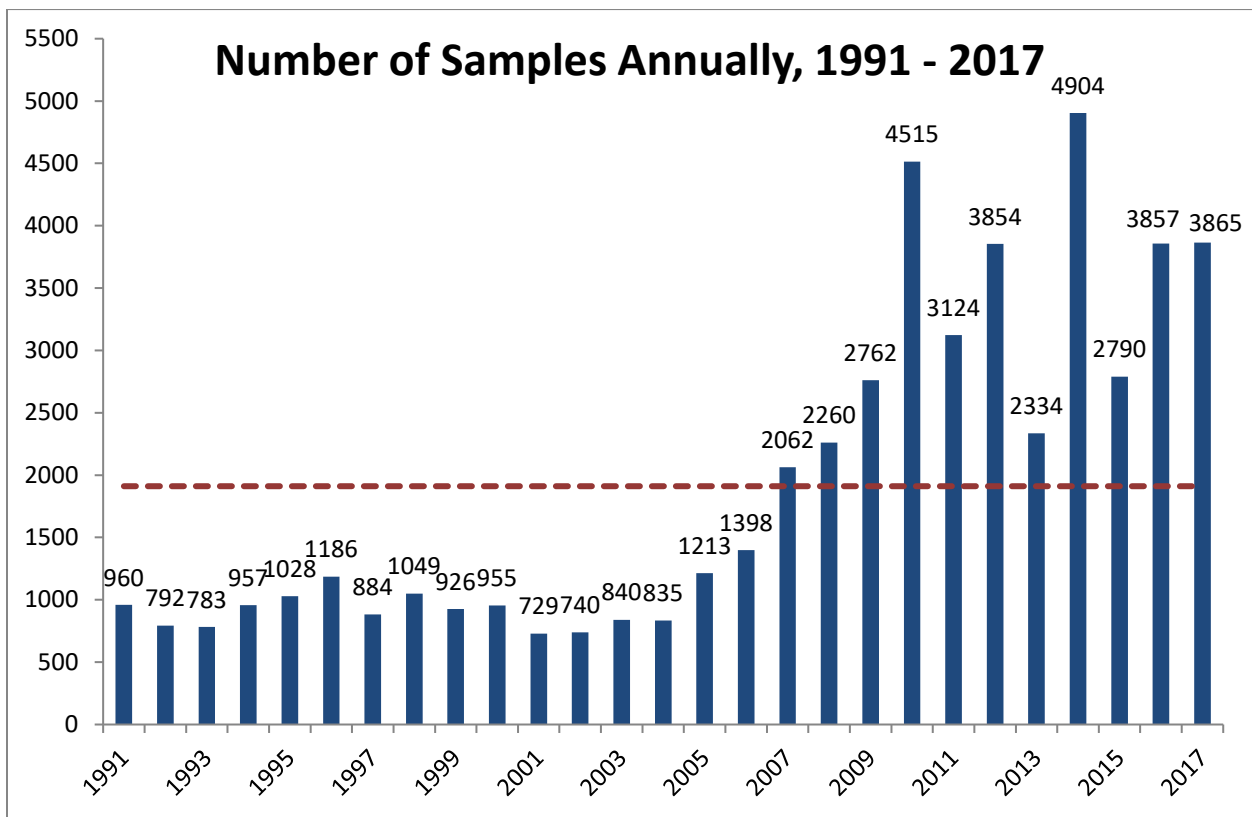
Turn-around times for certain tests like PCR and ELISA is generally within one working week, however, it may take longer depending on which day of the week the sample was received on, quantity of material submitted for testing, and the amount of available reagent. Additionally, conferences and utilization of annual leave time may interfere with average turn-around time. If you have any concerns, please contact us.

Often, by the time a sample is submitted to the lab, corrective measures for the current season may not be available; thus, the problem may be a management issue for subsequent seasons. In some cases, if the problem is especially new or unusual, there is no realistic way to determine the turn-around time. All submitters should contact the lab with any concerns regarding turn-around times.

## Lab Statistics

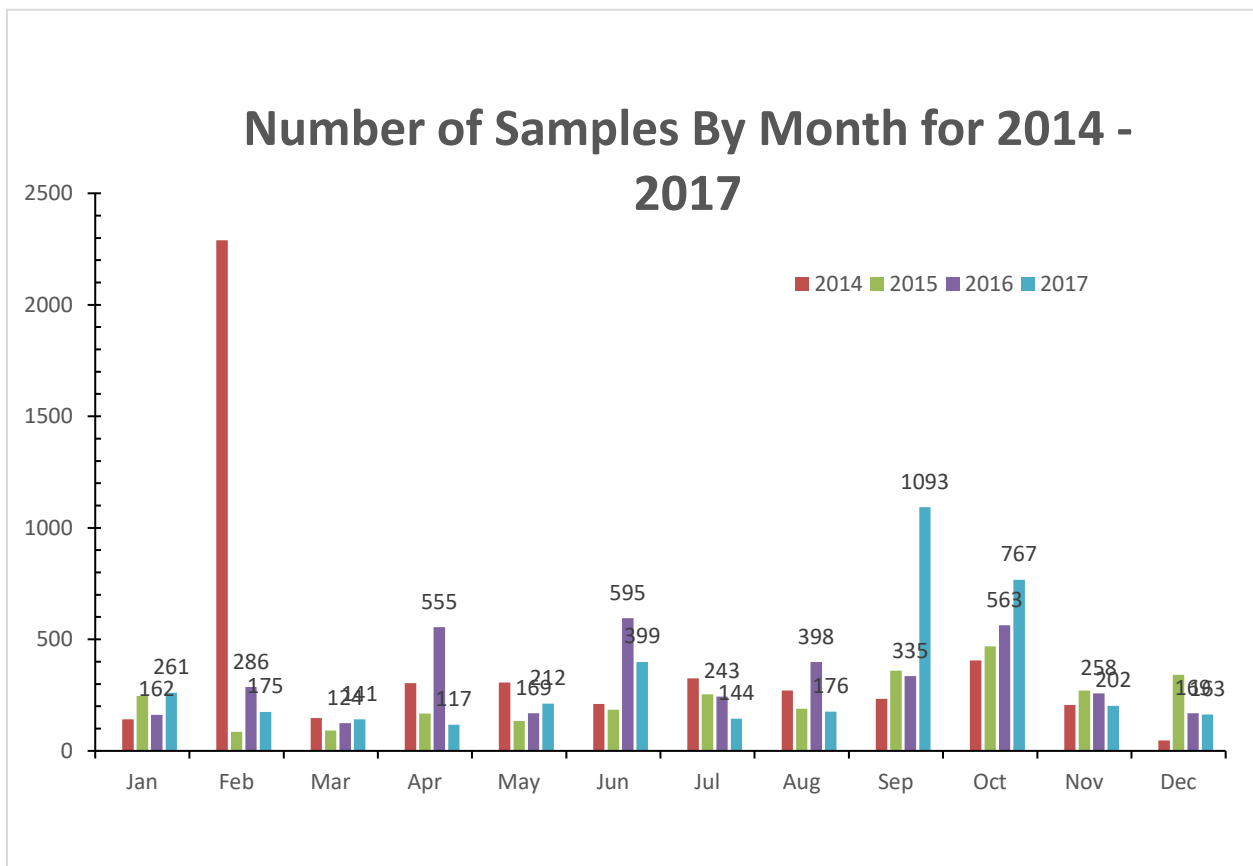
### Total samples Received by Year, 1991 through 2017

A historical perspective of total number of samples received by the lab is presented in the graph below. The total number of samples received per year includes routine diagnosis, phytosanitary certification, seed health, research, and survey samples. The average total sample number has been steadily on the rise, albeit inconsistently. A historical average of 1,911 samples have been processed per year (dotted red line).



## Monthly Sample Submission 2014 through 2017

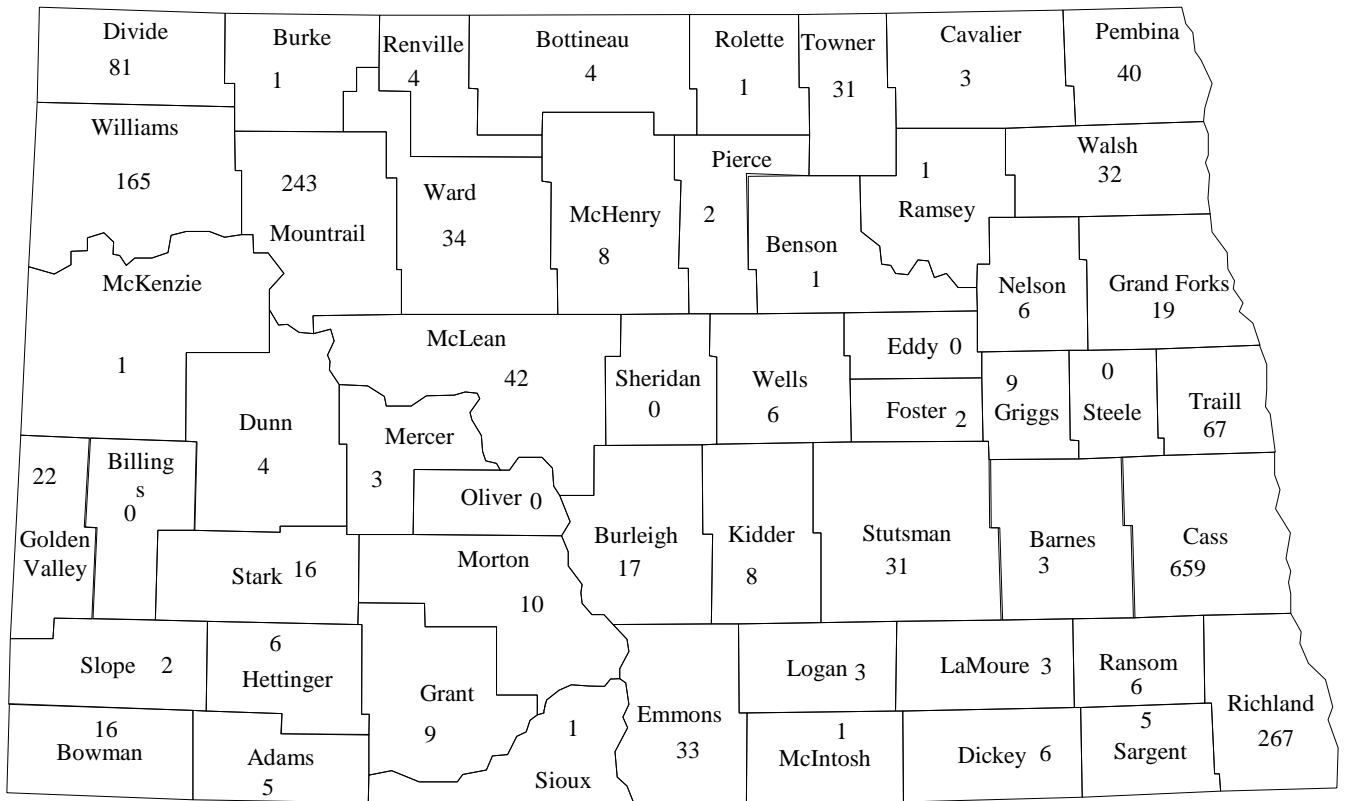
Samples submitted for routine diagnosis, seed health testing, phytosanitary testing, surveys, and research support are received throughout the year. A large proportion of samples received during June, July, and August are those for routine diagnosis, although survey samples and phytosanitary samples are also received during this time. Samples received in December, January, and February are predominantly research samples. Phytosanitary samples are received throughout the year and seed health testing occurs largely during fall, winter, and spring. The numerical data labels in the chart below correspond to 2017 data only. The large increase in sample numbers for 2014 is due to over 1,500 research samples being received in spring 2014, rather than December 2013 when such samples are normally received.





## North Dakota Samples by County 2017

Includes Routine Diagnosis, Phytosanitary, Research, Seed Health, and Survey samples.



## Out-of-State samples 2017

(Includes routine diagnosis, seed health, and phytosanitary samples)

Location	# Samples
Arizona	1
California	2
Colorado	67
Idaho	167
Illinois	1
Indiana	59
Louisiana	1
Massachusetts	1
Maine	3
Maryland	1
Michigan	63
Minnesota	333
Missouri	1
Montana	7

Location	# Samples
Nebraska	563
New Mexico	3
New York	8
Oregon	2
South Dakota	8
Tennessee	1
Texas	206
Utah	25
Virginia	2
Washington	7
Wisconsin	32
Wyoming	1
<b>Total Out of State</b>	<b>1565</b>

## Photo Insect Identification requests by country 2017

(This only includes photos submitted to the PDL from other countries)

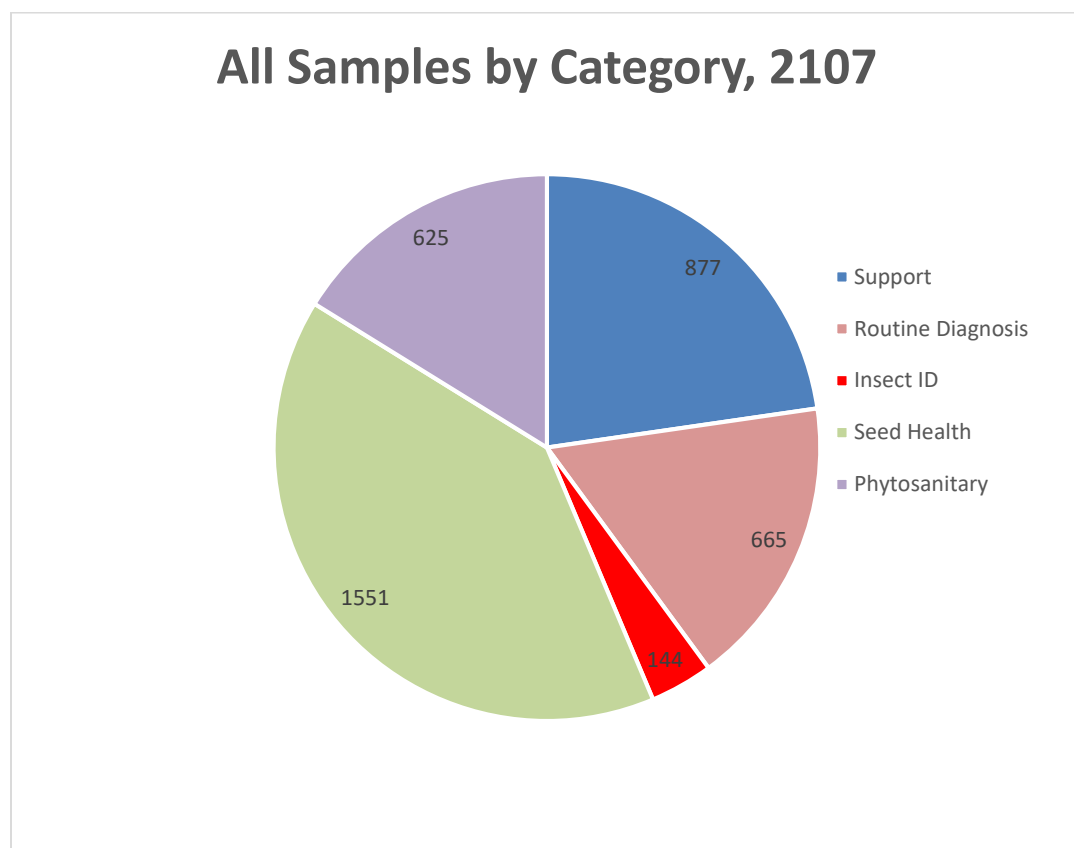
<u>Country</u>
Canada
Mexico
Sri Lanka
Turkey

## Total Number of Samples Received By Sample Category, 2017

Samples processed by the lab are separated into five main categories:

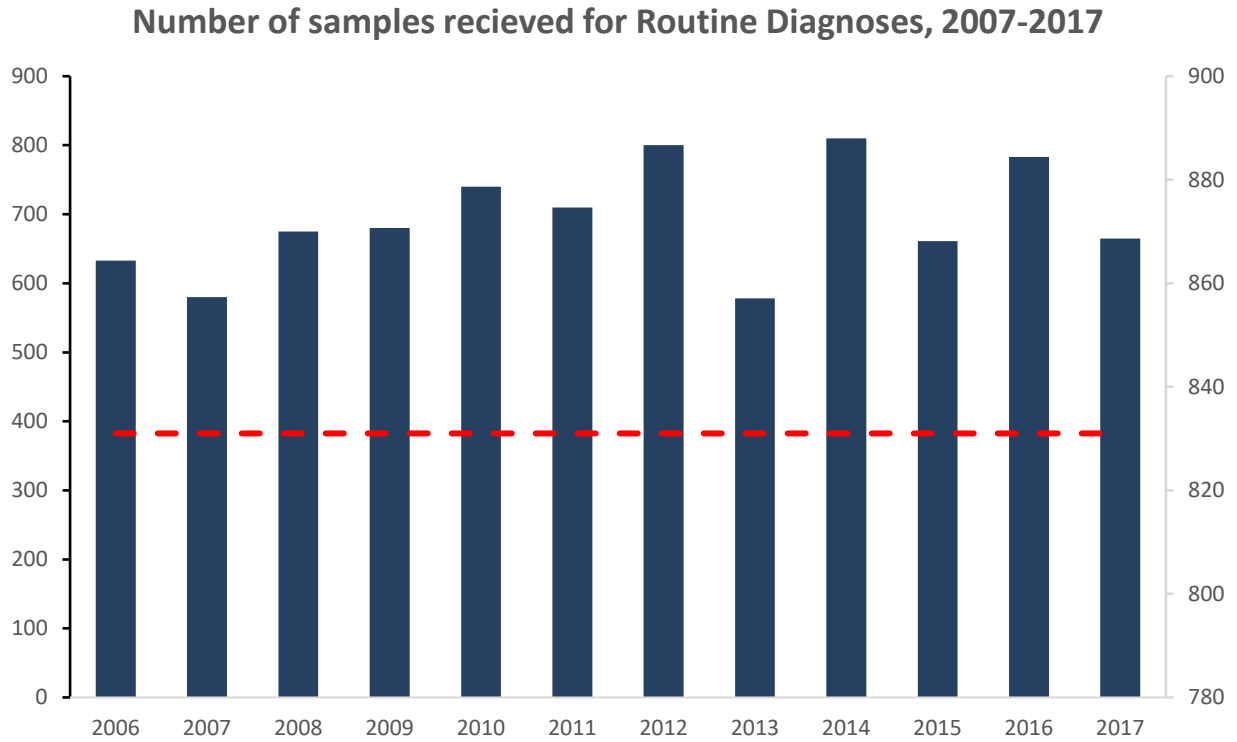
1. Support
2. Routine Diagnosis
3. Insect ID
4. Seed Health
5. Phytosanitary

A total of **3,865** samples were submitted in 2017. The pie chart below summarizes the total number of samples submitted by main category.



## Routine Diagnoses Received in 2017

The following figure details sample numbers for **Routine Diagnosis** only (Phytosanitary, Seed Health, and Research samples are NOT included). The ten-year average is 831.5 (dotted red line). While numbers were at the highest in 2014, they were close to average in 2015.



## Dutch Elm Disease in ND and MN

Dutch elm disease continues to infect American elm trees throughout the Red River Valley and the state of ND. The data presented here is limited to samples submitted to the Diagnostic Lab and as such cannot fully indicate whether incidence has risen or lowered from one year to the next. While symptoms of Dutch elm disease are fairly diagnostic by experienced tree health professionals, only a laboratory test can confirm the presence of the Dutch elm disease pathogen.

Keeping American elm trees healthy is the best defense against infection. An NDSU Extension bulletin is available with more information on managing Dutch elm disease. An electronic version of this publication is available online at:

<http://www.ag.ndsu.edu/publications/landing-pages/gardens-lawns-trees/dutch-elm-disease-in-nd-pp-1635>

A PDF version is available at: <http://www.ag.ndsu.edu/pubs/plantsci/trees/pp1635.pdf>

### Dutch Elm Disease Samples by ND County, 2013 - 2017

County, Number submitted	2013		2014		2015		2016		2017	
	Positive	Not Detected	Positive	Not Detected	Positive	Not Detected	Positive	Not Detected	Positive	Not Detected
Barns	--	--	--	--	--	--	--	1	--	--
Burleigh	1	--	--	--	--	--	--	--	--	--
Cass	8	--	2	--	5	2	2	3	3	--
Clay, MN	--	--	2	--	--	1	--	--	--	--
Dicky	--	--	--	--	--	--	1	--	--	--
Eddy	--	--	1	--	--	--	--	--	--	--
Griggs	--	--	--	--	1	--	--	--	--	--
Grand Forks	--	--	1	1	--	--	--	--	--	--
Kidder	1	--	--	--	--	--	--	--	--	--
Mountrail	--	--	1	--	--	--	--	--	--	--
Richland	1	--	--	--	--	--	--	--	--	--
Stark	--	1	--	--	--	--	--	--	--	--
Stutsman	--	1	--	--	--	--	--	1	--	--
Wells	--	--	--	--	--	--	--	--	--	1
<b>Total:</b>	<b>11</b>	<b>2</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>5</b>

## 2017 Sample Details

The table below summarizes selected diagnoses by the NDSU Plant Diagnostic Lab, sorted by host or habitat. Note that the level of confidence of the diagnosis is included, where **Confirmed** or **Suspected** indicates that the pest or pathogen was keyed out (morphology) or verified with serological or genetic testing, or based on general morphology, microscopy, or other evidence; **Not Detected** means that the pathogen was not detected using one or more tests such as microscopy, culture, serology, or PCR; or test results were contradictory or unresolved.

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Adzuki Bean</b> ( <i>Vigna angularis</i> )				
	Chemical injury (Abiotic disorder)	0	0	1
<b>Cowpea</b> ( <i>Vigna unguiculata</i> )				
	Unspecified Pathogen ( <i>Fusarium</i> sp./spp.)	1	0	0
	Cowpea Mosaic (Comovirus Cowpea Mosaic Virus)	0	0	1
<b>Alfalfa</b> ( <i>Medicago sativa</i> )				
	Alfalfa Mosaic (AMV) (Alfavirus Alfalfa Mosaic Virus)	0	0	1
	Hail Damage (Abiotic disorder)	0	1	0
<b>Apple, Common</b> ( <i>Malus sylvestris</i> )				
	Apple Powdery Mildew ( <i>Podosphaera leucotricha</i> )	1	0	0
	Fire Blight ( <i>Erwinia amylovora</i> )	1	0	0
	Frogeye leaf spot; Black rot ( <i>Botryosphaeria obtuse</i> )	1	1	0
	Silver Leaf ( <i>Chondrostereum purpureum</i> )	0	1	0
	Wood Rot Fungus ( <i>Bjerkandera adusta</i> )	1	0	0
<b>Apple, Domestic</b> ( <i>Malus domestica</i> )				
	Fire Blight ( <i>Erwinia amylovora</i> )	1	0	0
<b>Barley</b> ( <i>Hordeum</i> sp./spp.)				
	Bacterial Stripe; Black Chaff ( <i>Xanthomonas campestris</i> pv. <i>translucens</i> )	4	0	0
	Barley Stripe Mosaic Virus (BSMV))	0	0	1
	Barley Yellow Dwarf Virus (BYDV-MAV)	0	0	6
	Barley Yellow Dwarf Virus (BYDV-PAV)	0	0	6
	Barley Yellow Dwarf virus (BYDV)	0	0	6
	Cereal Yellow Dwarf Virus (CYDY)	1	0	5
	Dwarf bunt ( <i>Tilletia controversa</i> )	0	0	9
	Flag Smut ( <i>Urocystis tritici</i> )	0	0	2
	High Plains Disease (High Plains Virus (HPV))	1	0	5
	Wheat Streak Mosaic Virus (WSMV)	2	0	4
<b>Bean; Dry Bean</b> ( <i>Phaseolus vulgaris</i> var.)				
	Bean Anthracnose ( <i>Colletotrichum lindemuthianum</i> )	1	1	0
	Nematodes, Bulb & Stem ( <i>Ditylenchus</i> sp./spp.)	0	0	2
	Chemical Injury	0	2	2
	Colletotrichum Stem Decay ( <i>Colletotrichum</i> sp.spp)	0	0	3

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Bean; Dry Bean (<i>Phaseolus vulgaris</i> var.) cont.</b>				
	Cyst Nematodes ( <i>Heterodera</i> sp./spp.)	0	0	2
	Soybean cyst nematodes ( <i>Heterodera glycines</i> )	0	0	1
	Dome Test	3	0	0
	Ozone Damage (Abiotic Disorder)	0	1	0
	No Pathogen Found (Identification/analysis)	2	0	0
	Rhizoctonia root rot ( <i>Rhizoctonia</i> sp./spp.)	1	0	0
	Soil Compaction (Abiotic disorder)	0	1	0
	Unknown Abiotic Disorder (Abiotic disorder)	0	1	0
	Wind Damage (Abiotic disorder)	0	1	0
<b>Blackeyed Susan (<i>Rudbeckia hirta</i>)</b>				
	Verticillium wilt ( <i>Verticillium</i> sp./spp.)	0	1	0
	Growth regulator effect (Abiotic disorder)	0	1	0
<b>Black Walnut (<i>Juglans nigra</i>)</b>				
	Chemical Injury (Abiotic disorder)	0	1	0
<b>Blueberry (<i>Vaccinium</i> sp./spp.)</b>				
	Phomopsis Canker/Twig Blight ( <i>Diaporthe vaccinia</i> )	1	0	0
<b>Butterfly Bush (<i>Buddleia</i> sp./spp.)</b>				
	Leaf Scorch (Abiotic disorder)	0	1	0
	Leaf Spot (Unidentified Fungus)	0	1	0
<b>Cantaloupe (<i>Cucumis melo cantalupensis</i>)</b>				
	Bacterial fruit blotch ( <i>Acidovorax</i> sp./spp.)	0	1	0
<b>Cherry (<i>Prunus</i> sp./spp.)</b>				
	Chemical injury (Abiotic disorder)	0	0	1
	Leaf scorch (Abiotic disorder)	0	1	0
	Shothole leaf spot ( <i>Mastigosporella nyssae</i> )	1	0	0
<b>Amur Chokecherry (<i>Prunus maackii</i>)</b>				
	Mycosphaerella leaf spot ( <i>Mycosphaerella</i> sp./spp.)	0	1	0
<b>Chickpea (garbanzo) (<i>Cicer arietinum</i>)</b>				
	Ascochyta Blight ( <i>Ascochyta</i> sp./spp.)	0	1	1
	Bulb; Stem Nematodes ( <i>Ditylenchus</i> sp./spp.)	0	0	42
	Cyst Nematodes ( <i>Heterodera</i> sp./spp.)	0	0	42
<b>Chrysanthemum (<i>Chrysanthemum</i> sp./spp.)</b>				
	Septoria leaf spot ( <i>Septoria</i> sp./spp)	0	1	0
<b>Corn (<i>Zea mays</i>)</b>				
	Black Mold ( <i>Alternaria</i> sp./spp.)	1	0	0
	Chemical injury (Abiotic disorder)	0	0	1
	Cladosporium Mold ( <i>Cladosporium</i> sp./spp.)	1	0	0
	Cold Wet Soils (Abiotic disorder)	0	1	0
	Goss's Wilt/Goss's Bacterial Blight ( <i>Clavibacter michiganensis</i> subsp. <i>nebraskensis</i> )	6	0	4

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Corn (<i>Zea mays</i>) cont.</b>				
	Leaf Scorch (Abiotic disorder)	0	1	0
	No Pathogen Found (Identification analysis)	5	0	0
	Nutrient Imbalance (Abiotic disorder)	0	1	0
	Potassium Deficiency (Abiotic disorder)	0	1	0
	Rhizoctonia Damping Off ( <i>Rhizoctonia sp./spp.</i> )	1	0	0
	Unknown Abiotic Disorder	0	1	0
	Unspecified Pathology ( <i>Fusarium sp./spp.</i> )	1	0	0
	Wheat Curl Mite ( <i>Aceria tosichella</i> )	0	1	0
<b>Cucumber (<i>Cucumis sativus</i>)</b>				
	Cucumber Mosaic Virus (CMV)	0	0	1
	Mites	1	0	0
	Poor Pollination (Abiotic disorder)	0	1	0
	Thrips Damage (Unidentified Thrips)	1	0	0
<b>Elm (<i>Ulmus sp./spp.</i>)</b>				
	Dutch Elm Disease ( <i>Ophiostoma sp./spp</i> )	1	0	1
<b>Elm, American (<i>Ulmus americana</i>)</b>				
	Dutch Elm Disease ( <i>Ophiostoma sp./spp</i> )	2	0	0
<b>Fescues (<i>Festuca spp.</i>)</b>				
	Endophyte ( <i>Neotyphodium sp./spp.</i> )	1	0	0
<b>Flax (<i>Linum usitatissimum</i>)</b>				
	Chemical Injury, compaction (Abiotic disorders)	0	3	1
	Damping Off ( <i>Fusarium oxysporum</i> )	1	0	0
<b>Grape (<i>Vitis sp./spp.</i>)</b>				
	Grape Anthracnose; Birds-eye Rot ( <i>Elsinoe (Sphaceloma) ampelina (ampelinum)</i> )	0	0	1
	Grape Cane Gallmaker ( <i>Ampelogypter sesostris</i> )	0	1	0
<b>Hazel (filbert) nut (<i>Corylus maxima</i>)</b>				
	<i>Colletotrichum sp./spp.</i>	1	0	0
<b>Hackberry (<i>Celtis sp./spp.</i>)</b>				
	Chemical Injury (Abiotic disorder)	0	1	0
<b>Hollyhock (<i>Alcea rosea</i>)</b>				
	Hollyhock/Mallow Rust ( <i>Puccinia malvacearum</i> )	1	0	0
<b>Holy Thistle (<i>Cnicus benedictus</i>)</b>				
	Insect Damage (Unidentified insect)	0	1	0
	No Pathogen Found (Identification/analysis)	1	0	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Honeysuckle (<i>Lonicera sp./spp.</i>)</b>				
	Mechanical Damage (Abiotic disorder)	0	1	0
	Sunscald (Abiotic disorder)	0	1	0
	No pathogen found (Identification Analysis)	1	0	0
<b>Hops (<i>Humulus lupulus</i>)</b>				
	Potato leafhopper ( <i>Empoasca fabae</i> )	1	0	0
<b>Hydrangea (<i>Hydrangea sp./spp.</i>)</b>				
	Alternaria leaf spot ( <i>Alternaria sp./spp.</i> )	0	1	0
<b>Insect Identification</b>				
	Achemon Sphinx ( <i>Eumorpha achemon</i> )	1	0	0
	Ambush bug ( <i>Phymata sp.</i> )	1	0	0
	Aphids (Aphididae)	1	0	3
	Araneae	1	0	2
	Araneid spider ( <i>Micrathena sagittata</i> )	1	0	0
	Arthropods (Arthropoda)	0	0	2
	Banded Argiope spider ( <i>Argiope trifasciata</i> )	2	0	0
	Banded sap beetle ( <i>Glischrochilus fasciatus</i> )	1	0	0
	Barklouse (Liposcelidae)	1	0	0
	Bat bug ( <i>Cimex incrassatus</i> )	1	0	1
	Bed Bug ( <i>Cimex lectularius</i> )	1	0	0
	Black and yellow Argiope spider ( <i>Argiope aurantia</i> )	1	0	0
	Blacklegged tick ( <i>Ixodes scapularis</i> )	0	2	0
	Brown lacewings (Hemerobiidae)	1	0	0
	Calliphorid fly ( <i>Calliphora sp./spp.</i> )	1	0	0
	Carabid Beetle ( <i>Pterostichus sp./spp.</i> )	1	0	0
	Canadian tiger swallowtail ( <i>Papilio canadensis</i> )	1	0	0
	Carpenter ant ( <i>Camponotus sp./spp.</i> )	1	2	0
	Carpet beetles (Dermestidae)	3	0	0
	Cat-faced spider ( <i>Araneus gemmoides</i> )	1	0	0
	Celery looper ( <i>Anagrapta falcifera</i> )	1	0	0



Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Insect Identification cont.</b>				
	Chinese mantid ( <i>Tenodera aridifolia</i> )	1	0	0
	coenagrionidae (Coenagrionidae)	1	0	0
	Confused flour beetle ( <i>Tribolium confusum</i> )	1	0	0
	Crickets (Gryllidae)	1	0	0
	Cryptophagid beetle ( <i>Cryptophagus</i> sp./spp.)	1	0	0
	<i>Cylindroiulus</i> sp.	1	0	0
	Darkwinged fungus gnats (Sciaridae)	4	0	0
	Ebony Bugs (Thyreocoridae)	1	0	0
	European honey bee ( <i>Apis mellifera</i> european)	2	0	0
	Flour beetle ( <i>Tribolium</i> sp.)	1	0	0
	Foreign grain beetle ( <i>Ahasverus advena</i> )	3	0	0
	Fruit flies (Drosophilidae)	1	0	0
	German cockroach ( <i>Blattella germanica</i> )	0	1	0
	Giant horntail-eating ichneumonid ( <i>Megarhyssa macrurus</i> )	1	0	0
	Giant mayflies ( <i>Hexagenia</i> sp.)	1	0	0
	Golden silk orb weaver spider ( <i>Nephila clavipes</i> )	1	0	0
	Grass spider ( <i>Agelenopsis</i> sp./spp)	0	1	0
	Head louse ( <i>Pediculus humanus</i> )	1	0	0
	Indianmeal moth ( <i>Plodia interpunctella</i> )	1	0	0
	Japanese Beetle ( <i>Popillia japonica</i> )	1	0	0
	Julid millipedes (Julidae)	2	0	0
	Larder beetle ( <i>Dermestes lardarius</i> )	1	0	0
	Large Scarab Beetle ( <i>Osmoderma subplanta</i> )	1	0	0
	Leafy spurge hawkmoth ( <i>Hyles euphorbiae</i> )	1	0	0
	Long-bodied cellar spider ( <i>Pholcus phalangioides</i> )	1	0	0
	Longhorn Beetle ( <i>Neoclytus</i> sp./spp.)	0	1	0
	Loopers (Geometridae; Noctuidae)	0	0	1
	Masked hunter ( <i>Reduvius parsonatus</i> )	1	0	0
	Multicolored Asian lady beetle ( <i>Harmonia axyridis</i> )	2	0	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Insect Identification cont.</b>				
	Muscid fly ( <i>Potamia</i> sp./spp.)	1	0	0
	Net-winged beetle (Lycidae)	1	0	0
	Northern fowl mite ( <i>Ornithonyssus sylviarum</i> )	1	0	0
	Orb Weaver ( <i>zygiella atrica</i> )	1	0	0
	Painted lady ( <i>Vanessa cardui</i> )	1	0	0
	Parasitoid wasps (Chalcidoidea)	2	0	0
	Pentatomid bug ( <i>Euschistus</i> sp./spp.)	1	0	0
	Pigeon Tremex ( <i>Tremex columba</i> )	1	0	0
	Pillbugs; Sowbugs (Isopoda)	5	0	0
	Pine tip moth (Rhyacionia sp.)	1	0	0
	Potato psyllid ( <i>Bactericera cockerelli</i> )	10	1	1
	Pseudoscorpion (Pseudoscorpiones)	1	0	0
	Red flour beetle ( <i>Tribolium castaneum</i> )	3	0	0
	Reduviid bug ( <i>Zelus</i> sp./spp.)	1	0	0
	Robber flies (Asilidae)	1	0	0
	Saddleback Caterpillar ( <i>Acharia stimulea</i> )	1	0	0
	Sap beetles (Nitidulidae)	1	0	0
	Seed bugs (Lygaeidae)	1	0	0
	Seedcorn maggot ( <i>Delia (Hylemya) platura</i> )	0	1	0
	Shamrock orb weaver spider ( <i>Araneus trifolium</i> )	1	0	0
	Silken fungus beetle ( <i>Cryptophagus</i> sp./spp.)	1	0	0
	Slugs (Mollusca; Gastropoda)	0	0	1
	Smoky brown cockroach ( <i>Periplaneta fuliginosa</i> )	1	0	0
	Snakeflies (Raphidiidae)	1	0	0
	Sod Webworm (Crambidae)	1	0	0
	Spider mites (Tetranychidae)	0	1	0
	Spider wasps (Pompilidae)	1	0	0
	Spotted wing Drosophila ( <i>Drosophila suzukii</i> )	1	0	0
	Soybean aphid ( <i>Aphis glycines</i> )	1	0	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Insect Identification cont.</b>				
	Strawberry root weevil ( <i>Otiorhynchus ovatus</i> .)	4	0	0
	Striped earwig ( <i>Labidura riparia</i> )	1	0	0
	Swede midge ( <i>Contarinia nasturtii</i> )	0	0	1
	Thrips (Thysanoptera)	1	0	0
	Toad Bug ( <i>Gelastocoris oculatus</i> )	1	0	0
	Tree cricket ( <i>Oecanthus</i> sp./spp.)	1	0	0
	Variable darner ( <i>Aeshna interrupta</i> )	1	0	0
	Varied Carpet Beetle ( <i>Anthrenus verbasci</i> )	1	0	0
	Williams' tiger moth ( <i>Grammia williamsii</i> )	1	0	0
	Western flower thrips ( <i>Frankliniella occidentalis</i> )	1	0	0
	Whiteline Sphinx ( <i>Hyles lineata</i> )	2	0	0
	Wolf spider (Lycosidae)	1	0	0
	Wolf Spider ( <i>Pardosa xerampelina</i> )	1	0	0
	Wood Louse ( <i>Trachelipus rathkii</i> )	1	0	0
	Yellow mealworm ( <i>Tenebrio molitor</i> )	2	0	0
<b>Iris (<i>Iris</i> sp./spp.)</b>				
	Potyvirus ( <i>Potyvirus</i> sp./spp.)	1	0	
<b>Larkspur (<i>Delphinium</i> spp.)</b>				
	No pathogen found (Identification Analysis)	1	0	0
<b>Lentil (<i>Lens culinaris</i>)</b>				
	Ascochyta Blight ( <i>Ascochyta lentis</i> )	0	0	3
	Nematodes, Bulb & Stem ( <i>Ditylenchus</i> sp./spp.)	0	0	322
	Nematodes, Cyst ( <i>Heterodera</i> sp./spp.)	0	0	322
<b>Lilac, Japanese Tree (<i>Syringa reticulata</i>)</b>				
	Bacterial Blight ( <i>Pseudomonas syringae</i> pv <i>syringae</i> )	0	1	0
	Planting too deep (Abiotic disorder)	0	1	0
	Root girdling (Abiotic disorder)	0	1	0
<b>Lily (<i>Lilium</i> sp./spp.)</b>				
	No pathogen found (Identification Analysis)	1	0	0
<b>Lettuce (<i>Lactuca sativa</i>)</b>				
	Thrips ( <i>Thrips</i> sp./spp.)	1	0	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Maple</b> ( <i>Acer</i> sp./spp.)				
	Canker (Unidentified Fungus)	1	0	0
	Chemical Injury	0	0	1
	Maple Anthracnose	0	1	0
	Maple Bladdergall Mite ( <i>Vasates quadripedes</i> )	1	0	0
<b>Onion</b> ( <i>Allium cepa</i> )				
	Fungal Basal Rot (undetermined pathology)	0	0	1
<b>Pear</b> ( <i>Pyrus</i> sp./spp.)				
	High Soluble Salt (Abiotic disorder)	0	0	1
	Unknown Abiotic Disorder	0	1	0
<b>Peas, Dry Field Peas</b> ( <i>Pisum sativum</i> )				
	Ascochyta Blight ( <i>Ascochyta</i> sp./spp.)	0	0	4
	Drought Stress (Abiotic disorder)	0	1	0
	Nematodes, Bulb & Stem ( <i>Ditylenchus</i> sp./spp.)	0	0	256
	Nematodes, Cyst ( <i>Heterodera</i> sp./spp.)	0	0	256
	Low pH; Nutrient imbalance (Abiotic disorder)	0	2	0
	Pea seed-borne Mosaic Virus (PsbMV)	8	0	2
	Soil Compaction (Abiotic disorder)	0	1	0
<b>Pepper</b> ( <i>Capsicum</i> sp.)				
	Tomato spotted wilt virus (TSWV)	1	0	0
<b>Bell Pepper</b> ( <i>Capsicum annuum grossum</i> )				
	Chemical Injury (Abiotic disorder)	0	0	1
	No pathogen found	1	0	0
<b>Phlox</b> ( <i>Phlox</i> sp./spp.)				
	Unknown abiotic disorder	0	1	0
<b>Pine</b> ( <i>Pinus</i> sp.)				
	Unknown abiotic disorder (Abiotic disorder)	0	1	0
<b>Pine, Ponderosa</b> ( <i>Pinus ponderosa</i> )				
	Winter Injury (Abiotic disorder)	0	1	0
<b>Pine, Mugo</b> ( <i>Pinus mugo</i> )				
	Tortricid moth; Pine tip moth ( <i>Rhyacionia</i> sp.)	1	0	0
<b>Plant Identification</b>				
	American cranberrybush ( <i>Viburnum trilobum</i> )	0	1	0
	American elm ( <i>Ulmus americana</i> )	2	0	0
	American plum ( <i>Prunus americana</i> )	1	0	0
	Ash ( <i>Fraxinus</i> sp./spp.)	1	0	0
	Aster; Daisy Family (Asteraceae family)	0	1	0
	Barberry ( <i>Berberis</i> sp./spp.)	0	1	0
	Bigleaf hydrangea ( <i>Hydrangea macrophylla</i> )	0	1	0
	Birdsfoot trefoil ( <i>Lotus corniculatus</i> )	0	1	0
	Black chokecherry ( <i>Prunus virginiana</i> )	1	0	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Plant Identification cont.</b>				
	Bleeding Heart ( <i>Lamprocapnos spectabilis</i> )	1	0	0
	Buckthorn (Ornamental) ( <i>Rhamnus sp./spp.</i> )	1	0	0
	Bur oak; Mossy cup oak ( <i>Quercus macrocarpa</i> )	0	1	0
	Canada Red Chokecherry ( <i>Prunus virginiana</i> 'Canada Red')	1	0	0
	Cotoneaster ( <i>Cotoneaster sp.</i> )	2	0	0
	Common ragweed ( <i>Ambrosia artemisiifolia</i> )	1	0	0
	Common mullein ( <i>Verbascum Thapsus</i> )	0	1	0
	Common Waterhemp ( <i>Amaranthus rudis</i> )	1	0	0
	Dogwood ( <i>Cornus sp./spp.</i> )	1	0	0
	Garrison creeping foxtail ( <i>Alopecurus arundinaceus</i> )	1	2	0
	Giant hogweed ( <i>Heracleum mantegazzianum</i> )	0	2	0
	Korean Lilac 'Miss Kim' ( <i>Syringa pubescens subsp. patula</i> 'Miss Kim')	1	0	0
	Maple ( <i>Acer sp./spp.</i> )	1	0	0
	Nettle; Stinging Nettle ( <i>Urtica dioica</i> )	0	1	0
	Old-fashioned weigela ( <i>Weigela florida</i> )	0	1	0
	Pea shrub; pea tree ( <i>Caragana sp./spp.</i> )	1	0	0
	Peking cotoneaster ( <i>Cotoneaster acutifolius</i> )	0	1	0
	Poplar ( <i>Populus sp./spp.</i> )	1	0	0
	Prostrate knotweed ( <i>Polygonum aviculare</i> )	0	1	0
	Purslane speedwell ( <i>Veronica peregrine</i> )	1	0	0
	Russian olive ( <i>Elaeagnus angustifolia</i> )	1	0	0
	Siberian elm ( <i>Ulmus pumila</i> )	1	0	0
	Silver maple ( <i>Acer saccharinum</i> )	0	1	0
	Smokebush; Smoketree ( <i>Cotinus coggygria</i> )	1	0	0
	Spruce ( <i>Picea sp./spp.</i> )	1	0	0
	Swamp ragwort ( <i>Senecio congestus</i> )	1	0	0
	Tatarian honeysuckle ( <i>Lonicera tatarica</i> )	2	0	0
	Tenpetal blazingstar ( <i>Mentzelia decapetala</i> )	0	1	0
	Twinberry honeysuckle ( <i>Lonicera involucrate</i> )	1	0	0
	Unknown genera, specie	1	0	0
	Venice mallow ( <i>Hibiscus trionum</i> )	1	0	0
	Virginia creeper ( <i>Parthenocissus quinquefolia</i> )	1	0	0
	Winged euonymus ( <i>Euonymus alatus</i> )	0	1	0
	Yellow foxtail ( <i>Setaria glauca</i> )	0	1	0
<hr/>				
<b>Poplar</b> ( <i>Populus sp./spp.</i> )				
	Chemical Injury (Abiotic disorder)	0	0	1
<hr/>				
<b>Potato</b> ( <i>Solanum tuberosum</i> )				
	Aerial Blight ( <i>Rhizoctonia sp./spp.</i> )	0	0	1
	Bacterial Blight (Unidentified bacteria)	0	1	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Potato (<i>Solanum tuberosum</i>) contd.</b>				
	Bacterial rot; Bacterial blight ( <i>Dickeya</i> sp./spp.)	2	0	946
	Bacterial soft spot ( <i>Pectobacterium</i> sp./spp.)	5	1	3
	Chemical Injury (Abiotic disorder)	0	1	0
	Fusarium dry rot ( <i>Fusarium</i> sp./spp.)	3	0	2
	Fusarium stem rot ( <i>Fusarium</i> sp./spp.)	0	1	0
	Fusarium Wilt ( <i>Fusarium oxysporum</i> )	0	1	0
	Growth Regulator and Herbicide injury (Abiotic disorder)	1	1	0
	Late Blight ( <i>Phytophthora infestans</i> )	2	0	14
	Physiological Responses (Abiotic disorder)	0	1	0
	Potato Bacterial Ring Rot ( <i>Clavibacter michiganensis</i> subsp. <i>sepidonicum</i> )	187	0	1017
	Potato canker and black scurf ( <i>Rhizoctonia solani</i> )	2	0	3
	Potato Common Scab ( <i>Streptomyces scabies</i> )	2	0	7
	Potato Leaf Roll Virus (PLRV)	0	0	8
	Potato Mop Top Virus (PMTV)	0	0	49
	Potato Pink Rot ( <i>Phytophthora erythroseptica</i> )	2	0	0
	Potato Powdery Scab ( <i>Spongopora subterranea</i> )	1	1	8
	Potato Spindle Tuber Viroid (PSTVd)	0	0	5
	Potato Virus X (PVX)	2	0	3
	Potato Virus Y (PVY)	14	0	18
	Silver scurf ( <i>Helminthosporium solani</i> )	0	0	6
	Tobacco Rattle Virus (TRV)	14	0	41
	Unknown Abiotic Disorder	0	1	0
	Unknown Pathology ( <i>Botrytis</i> sp./spp.)	0	1	0
<b>Potato Equipment Swabs</b>				
	Potato Bacterial Ring Rot ( <i>Clavibacter michiganensis sepedonicus</i> )	0	0	233
<b>Millet (<i>Panicum miliaceum</i>)</b>				
	Unknown Abiotic Disorder	0	1	0
	No pathogen found (Identification Analysis)	1	0	0
<b>Pumpkin (<i>Cucurbita</i> sp./spp.)</b>				
	Papaya Mosaic Virus (PAPMV)	1	0	0
<b>Radish (<i>Raphanus sativus</i>)</b>				
	Crucifer clubroot ( <i>Plasmodiophora brassicae</i> )	0	0	1
	Root maggots; General (Anthomyiidae)	0	1	0
<b>Rape; Canola (<i>Brassica napus</i> var. <i>napus</i>)</b>				
	Crown and Root Rot ( <i>Phytophthora</i> sp./spp.)	0	1	0
	Crucifer clubroot ( <i>Plasmodiophora brassicae</i> )	1	0	0
	Chemical; Environmental injury	0	1	0
	Chemical Injury (Abiotic disorder)	0	1	1
	Powdery Mildew ( <i>Erysiphe</i> sp./spp)	2	0	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Rape; Canola</b> ( <i>Brassica napus</i> var. <i>napus</i> )	Unknown Abiotic Disorder	0	1	0
	<b>Raspberry</b> ( <i>Rubus</i> sp./spp.)			
	No Virus Found	1	0	0
	Unknown Abiotic Disorder (Abiotic Disorder)	0	1	0
<b>Rose</b> ( <i>Rosa</i> sp./spp)	Low pH; Nutrient imbalance (Abiotic disorder)	0	1	0
	Roseslug ( <i>Enedlomyia</i> sp./spp/)	1	0	0
	<b>Russian Thistle</b> ( <i>Salsola iberica</i> )			
	Herbicide Resistance (Abiotic disorder)	0	0	1
<b>Soil</b> (Habitat)	Cyst Nematodes ( <i>Heterodera</i> sp./spp.)	319	0	303
	Tobacco Cyst Nematodes ( <i>Globodera</i> sp./spp.)	0	0	300
	<b>Soybean</b> ( <i>Glycine max</i> )			
	(Abiotic disorder)	0	1	0
	Alfalfa mosaic virus (AMV)	0	0	1
	Chemical Injury (Abiotic disorder)	0	12	3
	Crown Rot ( <i>Rhizoctonia</i> sp./spp.)	2	0	0
	Damping off (unspecified pathology)	1	0	0
	Diaporthe Stem Rot ( <i>Diaporthe</i> sp./spp.)	3	1	1
	Fusarium Rot ( <i>Fusarium</i> sp./spp.)	8	0	1
	Minor root rot ( <i>Fusarium acuminatum</i> )	0	1	0
	Gibberella root rot ( <i>Fusarium graminearum</i> )	0	1	0
	Fusarium wilt ( <i>Fusarium oxysporum</i> )	3	0	0
	Insufficient Sample (Identification Analysis)	1	0	0
	Iron Deficiency (Abiotic disorder)	0	2	0
	No Pathogen Found (Identification Analysis)	1	0	0
	Thistle caterpillar ( <i>Vanessa cardui</i> )	1	0	0
	Physiological responses (Abiotic disorder)	0	0	1
	Pod and Stem Blight ( <i>Diaporthe (Phomopsis) phaseolorum sojae</i> )	3	4	0
	Pythium Blight; Root Rot ( <i>Pythium spinosum</i> )	0	1	1
	Rhizoctonia ( <i>Rhizoctonia solani</i> )	1	1	0
	Soil Compaction (Abiotic disorder)	0	3	0
	Soybean Brown Stem Rot ( <i>Cadophora gregata</i> )	0	0	1
	Soybean Cyst Nematode (SCN) ( <i>Heterodera glycines</i> )	241	0	48
	Soybean Mosaic Virus (SMV)	0	0	1
	Soybean Stem Canker ( <i>Diaporthe phaseolorum</i> )	5	1	1
	Unknown Abiotic Disorder (Abiotic disorder)	0	1	0
	White grubs (Phylophaga sp./spp)	1	0	0
	Wind damage (Abiotic disorder)	0	2	0

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Spruce</b> ( <i>Picea</i> sp./spp.)				
	Chemical Injury (Abiotic disorder)	0	1	0
	No Pathogen Found (Identification Analysis)	2	0	0
	Rhizosphaera needle cast (Rhizosphaera sp./spp.)	0	1	0
	Spruce Spider Mites ( <i>Oligonychus ununguis</i> )	0	3	0
	Stigmina Needle Blight ( <i>Stigmina lautii</i> )	3	0	0
	Unknown Abiotic Disorder (Abiotic disorder)	0	2	0
	Wind damage (Abiotic disorder)	0	0	1
	Winter injury (Abiotic disorder)	0	2	0
	Yellowheaded spruce sawfly ( <i>Pikonema alaskensis</i> )	0	1	0
<b>Spruce, Blue</b> ( <i>Picea pungens</i> )				
	Herbicide Injury; Exposure (Abiotic disorder)	0	1	0
	No pathogen found (Identification Analysis)	2	0	0
	Spruce spider mite ( <i>Oligonychus ununguis</i> )	0	3	0
	Stigmina Needle Blight ( <i>Stigmina lautii</i> )	1	0	0
<b>Spruce, Norway</b> ( <i>Picea abies</i> )				
	No pathogen found	1	0	0
<b>Strawberry</b> ( <i>Fragaria</i> sp./spp.)				
	High soluble salt (Abiotic disorder)	1	0	0
<b>Stinging Nettle</b> ( <i>Urtica</i> sp./spp.)				
	Bacterial rot; Bacterial blight ( <i>Dickeya</i> sp./spp.)	0	0	1
<b>Sugar Beet</b> ( <i>Beta vulgaris vulgaris</i> var. <i>altissima</i> )				
	Chemical Injury (Abiotic disorder)	0	2	0
	Fusarium Root; Crown Rot ( <i>Fusarium</i> sp./spp.)	2	0	1
	No Pathogen Found (Identification Analysis)	0	0	2
	Rhizoctonia Crown and Root Rot ( <i>Rhizoctonia solani</i> )	1	0	1
	Root Rot ( <i>Aphanomyces cochlioides</i> )	0	0	3
<b>Sunflower</b> ( <i>Helianthus annuus</i> )				
	Chemical Injury (Abiotic disorder)	0	2	2
	Unidentified bacteria	1	0	0
	Weevil ( <i>Smicronyx</i> sp./spp.)	1	0	0
	Wind Damage (Abiotic disorder)	0	1	0
<b>Tomato</b> ( <i>Lycopersicon esculentum</i> )				
	Bacterial Stem Canker ( <i>Clavibacter michiganensis michiganensis</i> )	0	1	0
	Chemical Injury (Abiotic disorder)	0	0	1
	Fusarium wilt ( <i>Fusarium</i> sp./spp.)	0	1	0
	Cucumber Mosaic (CMV)	2	0	1
	Impatiens necrotic spot ( <i>Tospovirus Impatiens Necrotic Spot Virus</i> )	0	0	3
	Insect Damage (Unknown Insect)	0	1	0
	Leaf Mold ( <i>cladosporium fulvum</i> )	0	1	0



Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Tomato (<i>Lycopersicon esculentum</i>) contd.</b>				
	Thrips Damage ( <i>Thrips sp./spp.</i> )	0	1	0
	Tobacco mosaic (TMV)	2	0	1
	Tomato Spotted Wilt Virus (TSWV)	5	0	2
	Unidentified Virus	0	1	0
<b>Bluegrass (<i>Poa sp./spp.</i>)</b>				
	Insufficient Sample (Identification Analysis)	1	0	0
<b>Fescues (<i>Festuca spp.</i>)</b>				
	Endophyte ( <i>Neotyphodium sp./spp.</i> )	1	0	0
<b>Turfgrass (Turfgrass mixed species)</b>				
	Ascochyta Leaf Spot ( <i>Ascochyta sp./spp.</i> )	0	1	0
	Dense Thatch Layer (Abiotic disorder)	1	2	0
	Earthworms (Phylum Annelida; Subclass Oligochaeta)	1	0	0
	Non-pathogenic; Saprophytic Fungus	0	1	0
	Nutrient Imbalance (Abiotic disorder)	0	1	0
	Soil compaction (Abiotic disorder)	0	1	0
	Take-All ( <i>Gaeumannomyces sp./spp.</i> )	0	1	0
	Unknown abiotic disorder (Abiotic disorder)	0	1	0
	Unspecified Pathology ( <i>Rhizoctonia sp./spp.</i> )	1	0	0
<b>Unknown Tree Species</b>				
	Chemical Injury (Abiotic disorder)	0	0	2
	Normal Plant Growth (Identification Analysis)	1	0	0
	Pine Needle Scale ( <i>Chionaspis pinifoliae</i> )	1	0	0
<b>Water</b>				
	High Salinity (Abiotic disorder)	0	1	0
<b>Water &amp; Soil</b>				
	High Soluble Salt (Abiotic disorder)	0	1	0
<b>Wheat (<i>Triticum sp./spp.</i>)</b>				
	Barley yellow dwarf (BYDV)	1	0	10
	Bunt ( <i>Tilletia sp./spp.</i> )	0	0	4
	Cereal Yellow Dwarf Virus (CYDV)	1	0	10
	Dwarf Bunt ( <i>Tilletia controversa</i> )	0	0	1
	Flag Smut ( <i>Urocystis tritici</i> )	0	0	1
	Head Blight ( <i>Fusarium graminearum</i> )	0	1	0
	High Plains Disease Virus (HPV)	5	0	6
	Septoria Leaf Spot ( <i>Septoria sp./spp.</i> )	0	0	1
	Smut ( <i>Urocystis sp./spp.</i> )	0	0	3
	Tan Spot ( <i>Drechslera sp./spp.</i> )	0	1	0
	Wheat Streak Mosaic Virus (WSMV)	8	0	3
	Wheat Seed Gall Nematode ( <i>Anguina tritici</i> )	0	0	50

Host	Diagnosis (Pathogen)	Confirmed	Suspected	Not Detected
<b>Wheat (Spring/Winter) (<i>Triticum aestivum</i>)</b>				
	Black Chaff ( <i>Xanthomonas translucens</i> )	3	0	0
	High Plains Disease Virus (HPV)	6	0	12
	Barley Yellow Dwarf Virus (BYDV)	4	0	14
	Cereal Yellow Dwarf Virus (CYDV)	5	0	13
	Chemical Injury (Abiotic disorder)	0	1	0
	Sorghum Fusarium Head Blight ( <i>Fusarium fujikuroi</i> )	0	1	0
	Stagonospora nodorum Blotch ( <i>Parastagonospora nodorum</i> )	1	0	0
<b>Durum (<i>Triticum turgidum</i>)</b>				
	Barley Yellow Dwarf (BYDV-MAV)	0	0	1
	Barley Yellow Dwarf (BYDV-PAV)	1	0	0
	Barley Yellow Dwarf (BYDV)	0	0	2
	Black Chaff ( <i>Xanthomonas translucens</i> )	3	0	0
	Bunt ( <i>Tilletia</i> sp./spp.)	0	0	2
	Cereal Yellow Dwarf Virus (CYVD)	1	0	2
	Dwarf Bunt ( <i>Tilletia controversa</i> )	0	0	1
<b>Durum (<i>Triticum turgidum</i>) cont.</b>				
	Flag Smut ( <i>Urocystis tritici</i> )	0	0	1
	High Plains Virus (HPV)	2	0	1
	Wheat Streak Mosaic Virus (WSMV)	3	0	0
<b>Willow (<i>Salix</i> sp./spp.)</b>				
	Herbicide Injury (Abiotic disorder)	0	1	0
<b>Willow Baccharis (<i>Baccharis salicina</i>)</b>				
	Dense Planting (Abiotic)	0	0	1
	Canker (Unidentified Fungus)	0	0	1

## Specialists consulted

Given the broad nature of the samples that we accept at the NDSU Plant Diagnostic Lab, accurate diagnoses often rely on collaboration with members of the Department of Plant Pathology, other departments at NDSU, and industry experts.

We would like to take this opportunity to acknowledge all faculty and specialists associated with NDSU as well as experts in private industry for their continued support of the lab. Without the expertise of a wide range of individuals, the quality of diagnoses from the lab would suffer tremendously.

The table below is an attempt to acknowledge the diagnostic assistance and other contributions of various faculty, specialists, and other professionals to the NDSU Plant Diagnostic Lab, and represent every individual who assisted with at least one sample (although most of you helped with multiple samples and we are extremely grateful!). Due to the nature of entering these 'consultants' into the database, a few people may have been inadvertently overlooked. For those who were mistakenly omitted from the list, please accept our sincere apologies. If you feel a name should be added to this list, PLEASE inform us so we can add it immediately.

<b>Name</b>	<b>Department</b>
Aimee Thapa	NDSU Extension Plant Pathology
Alan Zuk	NDSU Plant Sciences
Andrew Friskop	NDSU Extension Plant Pathology
Andrew Robinson	NDSU Extension Agronomist
Asunta Thompson	NDSU Plant Sciences
Berlin Nelson	NDSU Plant Pathology
Brad Schmidt	NDSU Plant Sciences
Chiwon Lee	NDSU Plant Sciences
David Franzen	NDSU Soil Sciences
Deying Li	NDSU Plant Sciences
Ester McGinnis	NDSU Extension Plant Sciences
Hans Kandel	NDSU Plant Sciences
Harlene Hatterman-Valenti	NDSU Plant Sciences
Jack Rasmussen	NDSU Plant Pathology
Jan Knodel	NDSU Extension Entomology
Jerry Fauske	NDSU Entomology
Jim Walla	NDSU Plant Pathology (retired)
Joe Zeleznik	NDSU Plant Sciences
Julie Pasche	NDSU Plant Pathology
Kimberly Zitnick	NDSU Plant Pathology
Kirk Howatt	NDSU Plant Sciences
Marisol Berti	NDSU Plant Sciences
Melanie Ziegler	NDSU Agriculture and Biosystems
Mohamed Khan	NDSU Plant Pathology
Pat Beauzay	NDSU Extension Entomology
Ron Smith	NDSU Plant Sciences
Robin Lamppa	NDSU Plant Pathology
Rod Lym	NDSU Plant Sciences
Sam Markell	NDSU Plant Pathology
Shawn (Edward) Dekeyser	NDSU Natural Resources Management
Tom Peters	NDSU Plant Science

# Thank You