NPDN
NATIONAL PLANT DIAGNOSTIC NETWORK

NPDN 2024 ANNUAL REPORT

OVERVIEW

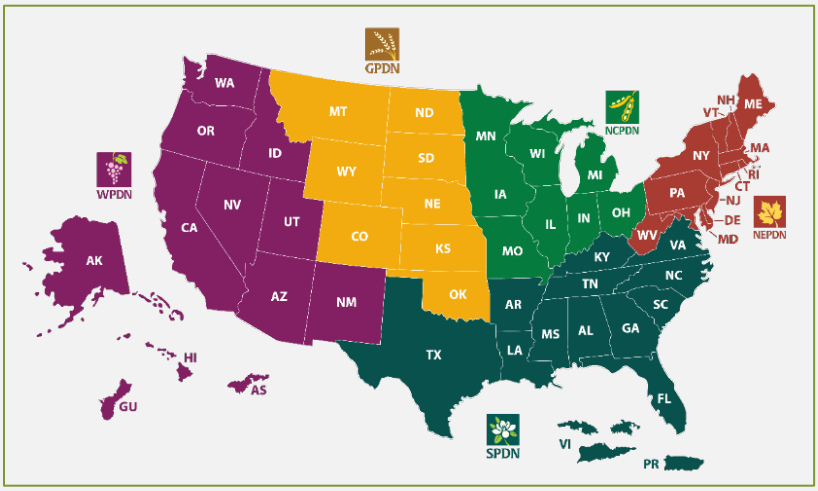
NPDN is a consortium of plant diagnostic laboratories established in 2002 to enhance agricultural biosecurity by detecting and more effectively communicating instances of biological attacks. NPDN's mission is to support plant health and biosecurity in U.S. agricultural and natural ecosystems by providing expert diagnostic capacity, communication, coordination, and quality pest and disease diagnostic information.

A NETWORK OF DISTRIBUTED DIAGNOSTIC CAPACITY

NPDN has established a nation-wide presence representing **125** laboratories in land grant universities (LGU; 106), state departments of agriculture (SDA; 15), federal agencies (1), and industry (3). NPDN labs are in all **50** states and **4** U.S. territories.

206 NPDN members, including **178** plant diagnostic professionals

To effectively coordinate the work of dozens of institutions and members across the U.S., the NPDN is divided into five regions, each organized around a Regional Center as follows:



- Northeast Plant Diagnostic Network (NEPDN), University of Maine
- Southern Plant Diagnostic Network (SPDN), University of Florida
- North Central Plant Diagnostic Network (NCPDN), Michigan State University
- Great Plains Diagnostic Network (GPDN), Kansas State University
- Western Plant Diagnostic Network (WPDN), University of California, Davis

Each regional center has been selected in a competitive grant process and oversees coordinating the communication and support of laboratories for all states in their region. Regional centers also work together to coordinate and implement all network programs and initiatives at the national level.

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NPDN 2024 ACCOMPLISHMENTS

This report lists the accomplishments of **73** labs from **50** states and **3** territories that answered the 2024 NPDN Lab Capacity and Impact Evaluation. This included **66** NPDN-funded labs and **7** additional non-funded NPDN labs.

ACCOMPLISHMENTS IN QUALITY DIAGNOSTIC:

NPDN aims to provide high-quality diagnostics to support plant health communities through constant improvement and quality assurance.

DIAGNOSTIC CAPACITY

389,621 samples processed by NPDN's extensive network of labs.

Labs reported **193** first detections. These are organisms found for the first time in a state. NPDN labs are trained to report first state occurrences to state regulatory partners, which can take informed action to prevent spread.

NATIONAL DATA REPOSITORY

The NPDN maintains the National Data Repository (NDR), the most comprehensive database of diagnostic information in the U.S. The NDR provides the plant diagnostic community with regional and national information on whether a pest or pathogen is new, emerging, re-emerging, or increasing in any given area. In 2024, the NDR received **225,829** diagnoses covering **78%** of the U.S. counties.

LABORATORY QUALITY ACCREDITATION

The NPDN manages the only accreditation program specialized in plant diagnostic labs in the U.S. In 2024, NPDN started accepting applications for the new Core Standard Accreditation program (that replaced the StarD program).

The Core Accreditation Program ensures that labs meet standards of quality and professionalism, strengthening their state of readiness in performing timely and accurate detections while reducing the risk of exotic pathogens and pest establishments.

The **first** NPDN lab received Core Standard Accreditation in 2024

DIAGNOSTIC PROFICIENCY

The NPDN also released the new NPDN Essential Proficiency Program. The program aims to establish a standard for measuring fundamental diagnostic knowledge among NPDN diagnosticians and to ensure the quality of data uploaded to the NDR.

NPDN labs also participate in APHIS-PPQ proficiency certification programs.

In 2024, 18 NPDN labs held one or more valid National Plant Protection Laboratory Accreditation Program certifications (NPPLAP; which are phasing out); and 17 NPDN labs obtained one or more of the newly implemented Plant Pathogen Diagnostic Certification Program (PPDCP) certifications. In total, **23** NPDN labs have valid proficiency certifications by USDA-APHIS form NPPLAP, PPDCP or both.

DIAGNOSTIC CAPABILITY

NPDN labs are mostly plant pathology and entomology labs, but they also provide diagnostic services in other fields of plant health.

	Pathology	Entomology	Nematology	Weed Science	Seed testing
Number of NPDN lab providers	**68**	**60**	**48**	**40**	**10**

NPDN plant pathology labs are equipped to conduct diagnostics using traditional techniques including visual diagnostics, incubation, isolation and microscopy. In addition, labs have the capability for molecular diagnostic techniques and other specialized tests listed below.

Diagnostic Method Category	Number of NPDN lab providers
Conventional PCR	58
Real-time PCR	45
ELISA	55
Basic DNA sequencing	41
Next-generation sequencing	6
Isothermal amplification	36
Resistance tests (fungicide, insecticide, herbicide)	23
Bioassay	39

NPDN member labs make extensive use of the network nature of the program to achieve efficiency in diagnostic determinations and maximize existing expertise.

52 NPDN labs (**71%**) can receive referral samples from other labs.

DIAGNOSTIC SURGE SUPPORT FOR REGULATORY PARTNERS

The National Plant Diagnostic Network (NPDN) serves regulatory partners with a distributed ability to process samples during agricultural emergencies.

Number of NPDN labs with surge support capability for organisms of concern

Regulated organism	Full capability	Some capability
Phythophtora ramorum ELISA	22	17
Plum Pox Virus ELISA	15	15
HLB qPCR	8	9
Pospiviroids	7	9
ToBRFV	17	22
Other APHIS-listed	14	9
Other (State listed)	15	7

ACCOMPLISHMENTS IN PROFESSIONAL DEVELOPMENT

NPDN aims to provide training opportunities and experiential learning that accelerate the learning curve and enhance diagnostic capabilities of the current and future diagnostic workforce.

PLANT DIAGNOSTIC WORKSHOPS

80% of NPDN labs participated in at least 1 NPDN-organized professional development event (median 4 events per lab). These events included:

- The 2024 National Meeting in Portland, Maine, September 8-12 - **149** participants
- **8** virtual and in-person advanced diagnostic workshops - **98** participants.
- **8** diagnostic webinars recorded live - combined attendance of **234** participants.

NPDN funds also help diagnosticians attend other (non-NPDN) professional development activities including professional conferences and workshops in various specialized topics. **66%** of NPDN labs attended at least one non-NPDN professional development activity (median 5 activities per lab).

ON-DEMAND VIRTUAL LEARNING SYSTEM

During 2024 NPDN added **2** new trainings and one new learning path containing **4** courses to the NPDN on-line virtual learning system for diagnosticians. In total **51** virtual trainings and webinars in diagnostics are currently available to NPDN members.

141 diagnostic professionals were active users of the NPDN virtual learning system, and during 2024, they jointly completed **340** online trainings.

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LEADERSHIP AND CAREER OPPORTUNITIES

NPDN committees provide NPDN members with the opportunity to provide leadership and steer all NPDN Programs that support the diagnostic community. NPDN members representing **47** labs nationwide participated in NPDN committees.

ACCOMPLISHMENTS IN COMMUNICATION

NPDN aims to facilitate effective and timely communications and productive collaborations with regulatory partners, diagnostic labs, and plant health communities; as well as curate and communicate quality diagnostic information that benefits plant health.

NPDN WEBSITE

The NPDN website (npdn.org) provides information about NPDN and our programs, it also contains diagnostic and outreach resources useful to diagnosticians in our network.

65,000 times that visitors engaged (clicks) with the NPDN website in 2024.

101,000 times that the NPDN website was visited.

THE NPDN COMMUNICATOR NEWSLETTER

The NPDN Communicator is a monthly publication to share information valuable to the plant diagnostic community.

12 issues of the NPDN Communicator were published in 2024; with an open rate monthly average of 38.9% and click average of 11%.

1046 subscribers including NPDN members and non-NPDN stakeholders received the NPDN Communicator.

85 published articles included committee and program information, network news, articles about work conducted by NPDN members, announcements from regulatory partners, and various articles on diagnostics.

REGULATORY COMMUNICATION AND SUPPORT:

NPDN strives to support and foster strong relationships with our regulatory partners in protecting plant health.

15 state department of agriculture labs are members of NPDN. **67** NPDN members are diagnosticians from SDA labs.

46 NPDN university plant clinics (70%) process regulatory samples for their SDA or act as the SDA lab in their state.

NPDN representatives participated in all **5** Regional and National Plant Board meetings.

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NPDN LABS WORKED TO ADVANCE THE SCIENCE OF DIAGNOSTICS

NPDN diagnosticians are active in communication in the field of diagnostics for scientific and academic audiences. In 2024, NPDN diagnosticians produced:

160 peer-reviewed publications related to diagnostic work.

234 presentations at scientific conferences and meetings, and **285** courses.

NPDN LABS OUTREACH TO PLANT HEALTH COMMUNITIES

NPDN diagnosticians are active in Outreach & Extension (O&E) communication with non-academic plant health communities in their state. In 2024, NPDN diagnosticians reached out to **967,000** people and produced:

386 outreach publications such as webpages, extension publications, and fact sheets.

1,206 Outreach & Extension presentations, and **171** radio or video appearances.

FISCAL EFFICIENCY AND NETWORK OPERATIONS

The five regional centers coordinate their work such that all the budgetary programmatic work for NPDN is centralized at the national level. Different regions take the leadership role in advancing different goals to reduce duplicative efforts and increase budget efficiency.

The organization has one full-time position (Secretary and National Coordinator) and two part-time positions (Accreditation Program Manager and Professional Development Coordinator).

NPDN programs work with member-led committees that steer the operation and implementation of the program activities. This bottom-up approach ensures that NPDN programs serve the needs of the diagnostic community.

In addition, NPDN provides financial support to one lab per state, averaging $25,000 per year. This financial support ensures lab participation and provides stability to university labs that frequently face uncertainty in their year-to-year funding.

Methods

This report is based on answers to the 2024 NPDN Annual Lab Capacity and Impact Evaluation, and data housed in the NPDN National Data Repository.

73 labs from **53** states and territories answered the 2024 Evaluation. Respondents represented labs from Land Grant Universities (91%) and State Departments of Ag (9%).

Year-to-year variations in the statistics shown in this report are partly due to differences in the number of labs responding to the survey.