

The Florida Plant Diagnostic Network¹

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Introduction

The University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) has a long and trusted relationship with those involved in agriculture. UF/IFAS has an existing infrastructure, the Cooperative Extension Service, which interacts closely and rapidly with growers, industry, and urban clients. It makes good sense to capitalize on UF/IFAS expertise—a staff of plant scientists with vast experience in integrated pest management and well-equipped plant pest diagnostic labs. Given the enormous range of land over which Florida farms, forests, rangelands, and agriculture related facilities are dispersed, it is critical that we have a similarly widespread capacity to detect, diagnose, and provide decision support in response to exotic plant pathogen, arthropod, nematode, and other pest introductions.

Federal and state agencies monitor US borders for plant pest introductions and survey for pest outbreaks throughout the nation. Still, new pests often are first detected by those involved in crop production and are identified by professionals at land-grant universities and state diagnostic labs. Since 2002, the National Plant Diagnostic Network (NPDN, <https://www.npdn.org/>) and the Southern Plant Diagnostic Network (SPDN, <https://www.npdn.org/spdn>) have provided support for a cohesive system to quickly detect and identify pathogens and other pests that have been accidentally or deliberately introduced into agricultural and natural ecosystems. When warranted, the NPDN reports pests to appropriate state and federal responders and decision-makers. Strengths of the NPDN system include:

1. rapid evaluation and reporting of potential pest threats;
2. quick response time for diagnosis, specifically real-time consultation with experts through DDIS (Distance Diagnostics and Identification Systems);
3. web-based, secure communications links among regional and national diagnostic labs;
4. established links to regulatory agencies including APHIS and FDACS;
5. high-quality and uniformity of information associated with samples;
6. high-quality recordkeeping and reporting of pest outbreaks; and

7. a trained network of "First Detectors" (or First Responders).

The SPDN and collaborators within Florida conduct training, produce and distribute educational materials, and provide diagnostic equipment and guidance to Extension faculty. This system creates a distributed network of capable people trained to detect, identify, and respond to new and emerging pests and pathogens. The first UF/IFAS Plant Disease Clinic was established in the 1950s. Satellite disease diagnostic clinics have been established in Quincy, Immokalee, Homestead, and Wimauma.

For high-risk arthropod or unusual samples in need of identification, the Insect Identification Laboratory in Gainesville, Florida, consults with the Florida State Collection of Arthropods (FSCA, <https://thefscs.org/>) and the appropriate curatorial taxonomic specialists employed by the Florida Department of Agriculture, Division of Plant Industry (FDACS-DPI).

The UF/IFAS Nematode Assay Laboratory in Gainesville, Florida, has been operational since the 1950s and provides professionals with identification services and population numbers of plant parasitic and soilborne nematodes present in samples. This information can provide a basis for UF/IFAS recommended IPM strategies. More information is available at <https://entnemdept.ufl.edu/nematology-assay-lab/>.

The Florida Plant Diagnostic Network

In 2004, UF/IFAS formally established the Florida Plant Diagnostic Network (FPDN). FPDN is a member of the SPDN and NPDN and comprises a plant pest diagnostic and reporting system, which will help growers, agricultural industry personnel, UF/IFAS Extension agents, and all other first detectors submit plant samples, digital images, and detailed crop information for pest diagnosis.

The FPDN focuses on diagnostics, digitally assisted diagnostics through DDIS, training of first detectors, and coordination of plant biosecurity activities with state and federal agencies.

The FPDN clinics are facilities of the Department of Plant Pathology and several Research and Education Centers at UF/IFAS. This partnership allows the clinics to maintain a strong connection with the leading Extension specialists and researchers in the fields of plant pathology, entomology, nematology, horticultural sciences, and agronomy

Diagnostic Services

Diagnosis is the process of identifying a pathogen based on a combination of the symptoms of disease and signs of causal agent. Efficient integrated pest management is dependent upon accurate knowledge of causal agents such as pathogens or pests. In many situations, pest management programs have been unsuccessful because of incorrect diagnosis.

FPDN clinic services include analysis of plant material for fungal, bacterial, and viral pathogens and providing appropriate control recommendations when available based on UF/IFAS pest management guides. In addition to classical diagnostic techniques, PCR (polymerase chain reaction) and ELISA (enzyme-linked immunosorbent assay) are being used for specific and sensitive detection and identification of plant pathogens. Extension faculty, growers, IPM providers, pest control and landscape maintenance companies, retailers, golf course managers, researchers, and homeowners submit samples to FPDN clinics.

Entomology-related FPDN clinic services primarily focus on morphological identification of specimens, but in some cases the FPDN communicates and collaborates with various groups to facilitate molecular identification of specimens on an as-needed basis. The collaboration of FPDN with specialist expertise at FDACS-DPI is integral to the quick, timely, and accurate identification of unusual specimens.

The FPDN works primarily through UF/IFAS Extension offices in Florida. If there is an office near you, you may want to contact them for assistance with your plant disease or pest problems. The UF/IFAS Extension personnel will be able to help you immediately. The clinics provide accurate plant disease diagnosis, professional services, and up-to-date control recommendations. Please follow the instructions at the following link for submitting samples carefully <https://edis.ifas.ufl.edu/sr007>. It is very difficult to make a diagnosis if a sample is collected, packed, and/or shipped improperly.

Distance Diagnostic and Identification System

A web-based Distance Diagnostic and Identification System (<http://ddis.ifas.ufl.edu/>), for the diagnosis of pest problems based on the electronic transmission of digital

images, is currently operational in Florida counties. UF/IFAS Extension agents, specialists, and the faculty of UF/IFAS Information Technology jointly developed this web-based system. In 1999, several clinic and UF/IFAS Extension specialists began receiving digital images of plant samples to enhance diagnostic capabilities. If you would like to learn more about how to submit plant pest samples using DDIS please contact your county Extension office. DDIS allows users to submit digital samples obtained in the field and related descriptive text provides a tool for identification of plant pests. The system provides an environment for UF/IFAS Extension agricultural agents and specialists to share information on plant pest issues. The following link will guide you to the DDIS website: <http://ddis.ifas.ufl.edu/>.

First Detector Training

Through assisting with trainings provided by county extension faculty, the FPDN contributes to a "First Detector" network to enhance monitoring the introduction of pests or unusual pest outbreaks. First detectors are an integral part of the system and include:

- Growers;
- Cooperative Extension Service personnel;
- Crop consultants and pesticide applicators;
- Master Gardeners; and
- Commercial chemical and seed representatives.

FPDN training resources for first detectors include proper techniques for sampling, monitoring, and identifying pests, and procedures for reporting pest problems. Through their county Extension service, first detectors have access to the web-based diagnostic system and can report unusual pest occurrences, existing crop conditions or other information. You can learn more about the Florida First Detector program here:

<https://entnemdept.ufl.edu/ffd/#:~:text=Florida%20First%20Detector%20is%20a,nursery%20industries%2C%20and%20natural%20areas>.

The following is a list of plant disease and pest diagnostic and identification services provided by UF/IFAS, in conjunction with the Cooperative Extension Service.

Gainesville

Florida Extension Plant Diagnostic Center

(This is the regional lab for the SPDN and IFAS hub for FPDN.)

Dr. Carrie Harmon
University of Florida
2570 Hull Rd.
Building 1291
Gainesville, FL 32611-0830

Note: For overnight mail or package delivery service

(UPS, Fedex, etc.), be sure to include the physical

street address: "UF, Bldg. 1291 2570 Hull Rd."

Phone: (352) 392-1795

E-mail: pdcc@ifas.ufl.edu

<https://plantpath.ifas.ufl.edu/extension/plant-diagnostic-center/>

Nematode Assay Lab

Dr. William T. Crow

UF/IFAS

Steinmetz Hall

PO BOX 110820

Gainesville FL 32611-0820

Phone: (352) 392-1994

E-mail: nemalab@ifas.ufl.edu

<https://entnemdept.ufl.edu/nematology-assay-lab/>

Mycology Herbarium

Dr. Matthew Smith

UF/IFAS Department of Plant Pathology

2517 Fifield Hall

Gainesville FL 32611

Phone: (352) 273-2837

E-mail: trufflesmith@ufl.edu

<https://plantpath.ifas.ufl.edu/extension/mushrooms/uf-fungal-herbarium/>

Insect Identification

Mr. Lyle Buss

University of Florida

1881 Natural Area Dr.

PO BOX 110620

Gainesville, FL 32611-0620

Phone: (352) 273-3933

FAX (352) 392-5660

E-Mail: ljbuss@ufl.edu

<https://entnemdept.ufl.edu/insectid/>

Herbarium

Dr Alan R. Franck

University of Florida Herbarium (FLAS)

Florida Museum of Natural History

379 Dickinson Hall

PO Box 110575

Gainesville, FL 32611-0575

Phone: (352) 273-1990

E-mail: herb@flmnh.ufl.edu

<https://www.floridamuseum.ufl.edu/herbarium/>

* All plant samples for identification should be submitted to the local County Extension Agent first.

Quincy

Florida Extension Plant Diagnostic Clinic

Dr. Mathews Paret

UF/IFAS North Florida REC

155 Research Road

Quincy, FL 32351

Phone: (850) 875-7140

FAX: (352) 846-6617

E-mail: fbiriarte@ufl.edu

<https://nfrec.ifas.ufl.edu/plant-pathology-clinic/>

Immokalee

Florida Extension Plant Diagnostic Clinic

Dr. P. D. Roberts

UF/IFAS Southwest Florida REC

2686 SR 29 North

Immokalee, FL 34142

Phone: (239) 658-3431

FAX: (239) 658-3469

E-mail: pdr@ufl.edu

<https://swfrec.ifas.ufl.edu/programs/veg-plant-path/plant-clinic/>

Wimauma

Florida Extension Plant Diagnostic Clinic

Dr. Natalia Peres

UF/IFAS Gulf Coast REC

14625 C.R. 672

Wimauma, FL 33598

Phone: (813) 419-6599

FAX: (813) 634-0001

E-mail: nperes@ufl.edu

<https://gcrec.ifas.ufl.edu/plant-clinic/>

Homestead

Florida Extension Plant Diagnostic Clinic

Dr. Romina Gazis

UF/IFAS Tropical REC

18905 S.W. 280th St.

Homestead, FL 33031-3314

Phone: (786) 217-9276

FAX: (305) 246-7003

E-mail: trec-pdc@ifas.ufl.edu

<https://trec.ifas.ufl.edu/plantdiagnosticclinic/>

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