Worth the time and money?

Proper diagnosis is essential to managing an insect pest or plant disease. Inappropriate methods—or techniques applied at the wrong time—can waste time and money and might be hazardous to the applicator and the environment. They could even compound a pest problem.

Identification isn't always easy, even with a specimen in hand. For example, pathogens (disease-causing agents) often have complex life cycles. Once a plant is stressed, secondary agents may take advantage of its weakened condition, masking the presence of the pathogen that initially caused the problem.

The **Plant Disease Diagnostic Clinic** analyzes plants and soil for pathogenic bacteria, fungi, viruses, and nematodes; the clinic also identifies plants. The **Insect Diagnostic Laboratory** identifies insects and insect damage (many specimens are pests of plants, animals, stored foods, or buildings). Reports usually include pest management suggestions. (For more information about integrated pest management, contact your local Cooperative Extension office or the NYS IPM Program).

Both clinics strive to identify problems as quickly as possible. In most cases, the laboratories provide results in one to three days by e-mail or fax, or one to two weeks by mail (a written copy is always sent). Of course, some mysteries take longer to solve.

To allow the diagnosticians to do their best work, please follow the guidelines in the box for collecting and shipping all samples, plus the suggestions specific to plant or insect samples. If you have questions, check the website or contact the clinic for advice first.

Both clinics have received problematic submissions. Imagine trying to work with a single insect that's been crushed into shards, a tomato that's become juice, or the wrong part of a plant. The diagnosticians are not psychics! The accuracy of their analysis depends on the quality of the sample.

For best results, expertly request expert advice

Do not fold, spindle, or mutilate: guidelines for all submissions

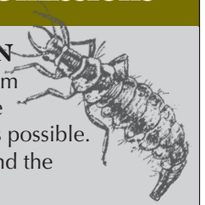
COLLECTING

- Gather a fresh, representative, generous sample.
- Collect **before** applying any pesticides.

PACKAGING

- Wrap your sample as if it were an expensive and fragile gift. Pack it securely within a sturdy box. Consider packaging this in another box for added protection. (Please read the section about plant or insect samples—there are specific tips).
- Include the submission form and payment. (Payment is needed before processing; fees range upward from $25 for both clinics.)
- Try to preserve the color, shape, and features of the specimen. Don't use glue or scotch tape.
- Inflated plastic bags, shipping peanuts, or crumpled newspaper placed around the sample provide excellent protection.

SHARING INFORMATION



- Please fill out the submission form carefully (keep a copy). Describe the situation in as much detail as possible. Include the date of collection, and the location (nearest town or city).
- Always include a return address.
- For a faster response include your fax number or e-mail address. (Indicate which you prefer.)

SHIPPING

- Ship "live" samples by the fastest means possible to avoid deterioration.
- If you can't mail the sample immediately, keep it refrigerated or out of direct sunlight.
- Mail samples early in the week to avoid weekend layovers in the post office.
- Before holidays, call the clinic before shipping.

Insect samples

Please send 10 or more insects, if possible, and all life stages present (e.g., egg, larva or nymph, pupa, adult).

If you're submitting a plant pest, please include or identify the plant material on which the insects were found. This is useful and sometimes absolutely necessary for insect identification. If you don't see any insects but suspect the problem is caused by them, collect several samples of damaged plants showing a progression of symptoms. If the plants are small, consider submitting an entire plant. (Refer to the plant section for wrapping and shipping details.)

It's illegal to send some live insects through the mail. Please submit preserved specimens.

Preserving and packaging insects

Small or soft-bodied insects: Grubs and caterpillars must be prepared before preservation to prevent discoloration. Drop them into gently boiling water for about 30 seconds, then transfer them into a vial containing 70–80% alcohol or 100 proof liquor. Please indicate the original color of the specimen.

Aphids, spiders, and other small arthropods may be placed directly in a vial containing alcohol.

Large or hard-bodied insects (e.g., beetles, wasps, butterflies, moths, cockroaches): To kill them, put them in a freezer for a day. Gently sandwich the dead insects between layers of cotton or tissue, then place them in a sturdy container.

Ship to:
Insect Diagnostic Laboratory
Cornell University
Department of Entomology
4140 Comstock Hall
Ithaca, NY 14853-0901

Phone: (607) 255-3250
Insect "hotline": (607) 255-4777*
Fax: (607) 255-0939
Email: ck20@cornell.edu
www.cals.cornell.edu/dept/entom/DiagnosticLab/default.htm

*Phone consultations on Tuesdays & Thursdays, 9 a.m.–noon and 1–4 p.m. E.S.T. The fee is $10 per call (Mastercard or Visa required).

Plant disease samples

Provide a good amount of root, crown, and leaf material—*send the whole plant, if possible.* Dig the plants; do not yank them out of the ground. Select specimens that exhibit early symptoms—a completely dead section may no longer contain the source of the problem.

Turf: The specimen should be at least 4" in diameter and as deep as the roots. Collect from the border between healthy and diseased turf.

Fruit, tubers, vegetables: Select specimens that show early stages of decay. Include leaves and stem, if possible.

Inflated plastic bags protect sample during shipping

For plant identification:
Many local Cooperative Extension offices provide superb plant identification. Specimens that defy identification may be sent to Cornell. Try to pick plants that show both older and newer leaves and flowers.

For nematode identification: During the active growing season, use a standard 1" soil auger (tube) to collect six soil core samples at a depth of 4" below the surface of the soil. Collect randomly from an area of approximately one acre. (If sampling from an individual specimen such as a tree, collect the soil from within the dripline of the tree's canopy.)

Mix the samples thoroughly in a clean container, then transfer about a pint of soil to a plastic bag. Be gentle; don't overmix the soil. Some nematodes can be injured easily. Keep the sample cool until it's shipped.

Wrapping and packaging plants

Whole plant in a "live" state: Wrap the roots and lower shoots in wet paper towels, then enclose in a plastic bag. If sending a potted plant, cover the pot with a plastic bag. You may wish to enclose the upper foliage in a plastic bag that's had holes punched in it. Do not water the plant before shipping.

Fruits, tubers, vegetables: Wrap in dry paper towels or newspaper. Wrap again with aluminum foil, wax paper, or plastic that's had holes punched in it.

To dry and press a specimen: Collect when its foliage is dry. Shake most of the soil out of the roots. Arrange the plant on paper; press down gently to flatten it. Cover with paper, then sandwich this between a few pieces of cardboard or within a press. Lay a weight on top. Store in a warm, dry area until the plant is dry.

On the submission form, describe what's happening over the whole landscape (for example, are all trees affected, or only one species?), and the effects on an individual plant ("abnormal swelling in the main stem"). Tell us about your cultural practices: watering, mowing, fertilizing, and any chemical applications.

Include photographs with your submission—if it's not too much trouble, and won't delay shipping. Pictures can be extremely helpful, but most analyses are done without them. Take several views: the overall landscape, a close-up of a single plant, and a close-up of the symptoms of the problem.

Ship to:

Plant Disease Diagnostic Clinic
Cornell University
Department of Plant Pathology
334 Plant Science Bldg.
Ithaca, NY 14853-4203

Phone: (607) 255-7850
Fax: (607) 255-4471
Email: kls13@cornell.edu
http://PlantClinic.cornell.edu

Other Cornell facilities that provide useful related services include:

Cornell Nutrient Analysis Laboratories
Cornell University
Dep't. of Soil, Crop, and Atmospheric Sciences
804 Bradfield Hall, Ithaca, NY 14853-1901
(607) 255-4540 • Fax: (607) 255-7656
Email: mp85@cornell.edu
www.css.cornell.edu/soiltest
Soil testing for nutrient status and pH

ICP Analytical Laboratory
Cornell University
Department of Horticulture
135A Plant Science Building, Ithaca, NY 14853
(607) 255-1785 • Fax: (607) 255-0599
Email: ldt1@cornell.edu
www.fvs.cornell.edu/ICP/hotlab.htm
Analysis of nutrients and heavy metals in plant tissue and pollution testing of water and soil

Cornell Cooperative Extension
To find your local office, check your phone book or www.cce.cornell.edu
Diverse array of information and services

A reasonable guess can be risky...

Yellowing and reduced growth might lead you to suspect a plant disease, but there could be another cause: nematodes. These microscopic worm-like animals feed mainly on plant roots, causing symptoms that mimic plant diseases. In addition, the wounds they inflict predispose plants to infection by pathogens, which further complicates the situation.

Without expert diagnosis, you could try to solve the wrong problem. Would you know to submit a *soil* sample for nematode analysis—and how to properly collect one?

Hone your sampling expertise to get the most out of our expertise. Inside are tips about how to collect and submit plant and insect samples.

The New York State IPM Program

IPM Integrated Pest Management

We encourage people to adopt a sustainable approach to managing pests, using methods that minimize environmental, health, and economic risks. For more information: NYS Integrated Pest Management Program, 1-800-635-8356; NYSAES, Geneva, NY 14456; <www.nysaes.cornell.edu/ipmnet/ny>. For additional copies of this brochure (IPM No. 607), contact your local Cooperative Extension office or the NYS IPM Program.

Cornell Cooperative Extension

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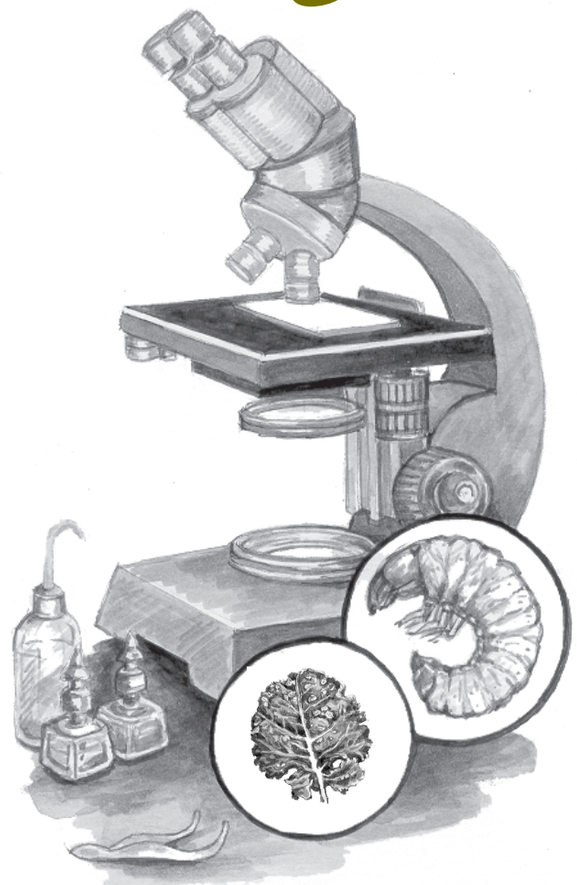
Test, don't guess.



How to submit plant and insect samples for diagnosis.

CORNELL UNIVERSITY

IPM Integrated Pest Management