

Plant Disease Diagnostic Procedures & Sample Submissions



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What we do:

Determine the cause of plant problems

- Abiotic Stresses
 - Nutrient deficiencies
 - Mechanical damage
 - Air pollution
- Pathogenic Diseases
 - Viruses
 - Bacteria
 - Fungi
 - Phytoplasmas
 - Nematodes
- Certain labs offer arthropod ID services



What harmed/is harming the plant & why?

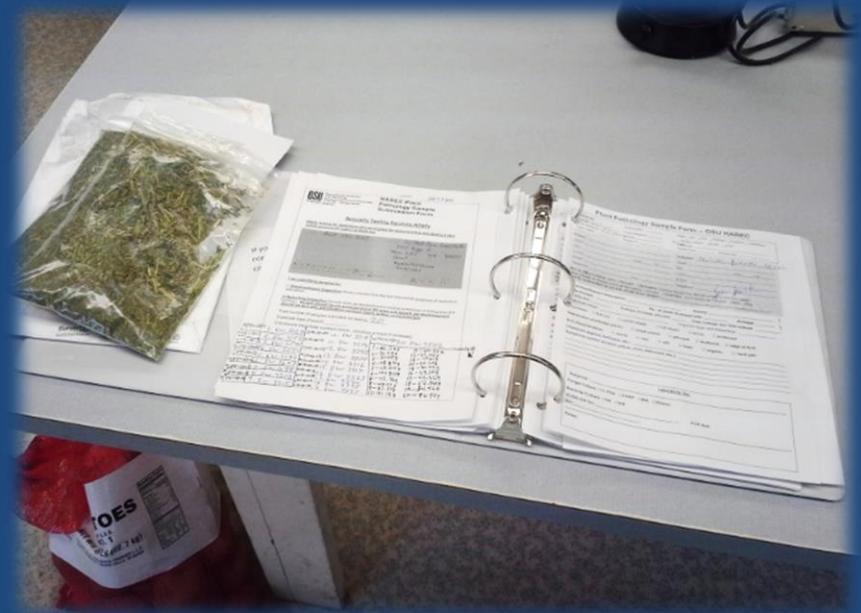


Test, don't guess!



How do we do this?

- Gather information
 - Date, variety, % affected, previous crops, irrigation type, exposure, distribution, spray history



OSU Oregon State University
 Extension Plant Pathology
 Harmoniston Agricultural Research & Extension Center
 2121 South 1st Street
 Hermiston, OR 97838
 541-867-8322

HAREC Plant Pathology Sample Submission Form

Office Use:
 Date Rec. _____
 PCE# _____

Grower: _____ **Submitter:** _____
 Street: _____ Street: _____
 City: _____ State _____ Zip _____ City: _____ State _____ Zip _____
 County: _____ County: _____
 E-mail: _____ E-mail: _____
 Telephone: _____ Fax: _____ Telephone: _____ Fax: _____

Bill to (Must check one): Grower Submitter (General Sample Fee: \$60.00; additional fees may apply)
Send results to (Please check all that apply): Grower Submitter Send results via: E-mail Mail Fax

Host/Plant: _____ **Variety:** _____
Date Planted: _____ **Number of years at present site:** _____
Previous crops: _____

Acreage: _____ **% Affected:** _____ **Number of plants affected:** _____

Exposure: full sun partial shade full shade windy protected
Distribution of affected plants: single plants grouped scattered edge of field
Soil characteristics: sandy clay silt loam organic hard pan

Irrigation type and frequency: _____
Fertilizer Applications (product, rate, frequency): _____
Pesticide Applications (Insecticides, Fungicides, Herbicides, rates, frequency, etc.): _____

Date damage was first noticed: _____
Symptoms: Circle all that apply.

Leaves		Stems		Fruit		Roots	
Wilted	Mishaped	Stunting	Wilted	Spots	Holes	Rotten	Stunting
Yellowing	Curling	Spots	Mishaped	Mishaped	Sticky	Discolored	Sparse
Chlorosis	Spots	Brittle	Cracks	Discolored		Shallow Growth	Dry/Brittle
Browning	Discolored	Streaking	Lodging	Rotten		Mishaped	
Early Drop	Tattered	Exuding Sap		Streaking		Easily Uprooted	
Brittle	Mosaic	Holes		Early Drop		Bumps	
Rotting		Discolored		Cracks		Streaking	

Additional Symptoms:



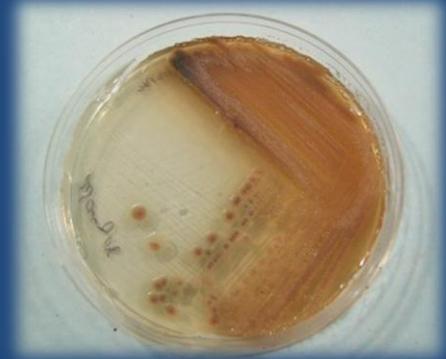
How do we do this?

Initial examination

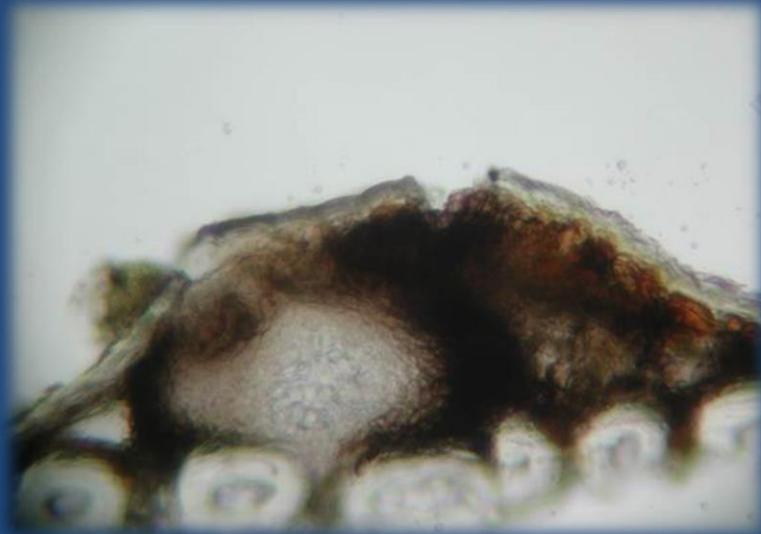
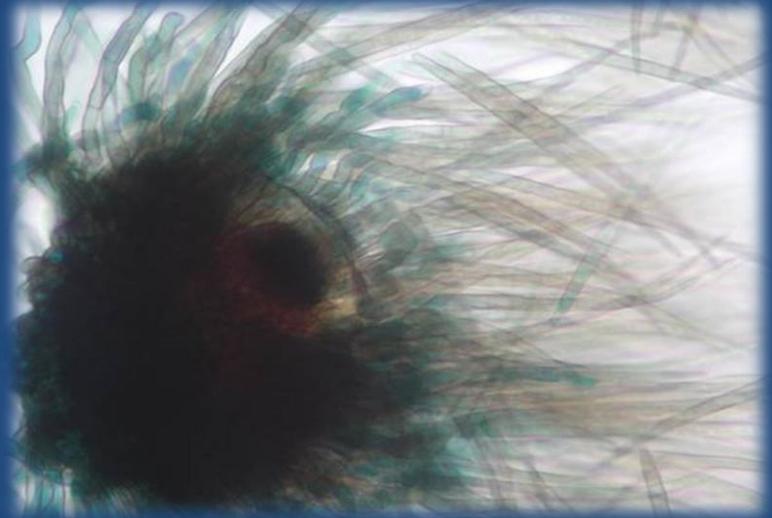
- Roots, stems, leaves, tubers, fruit
- Symptoms
- Signs



What should be done?



How do we do this? Microscopy



How do we do this?

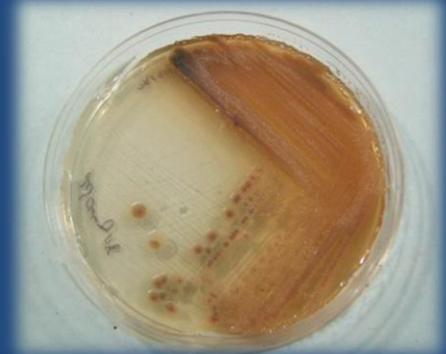
Initial examination

- Roots, stems, leaves, tubers, fruit
- Symptoms
- Signs



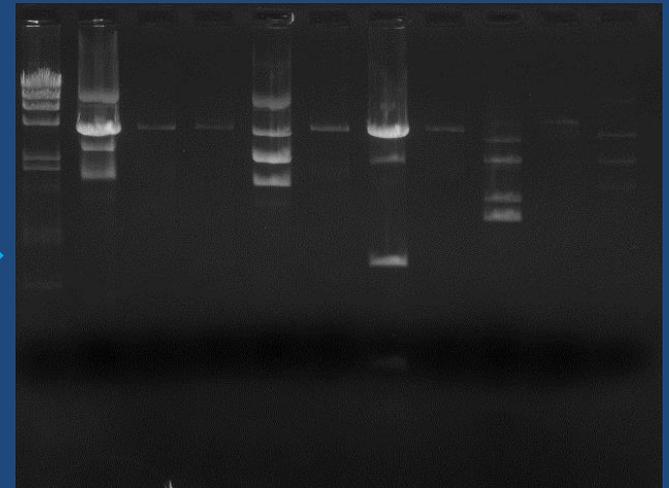
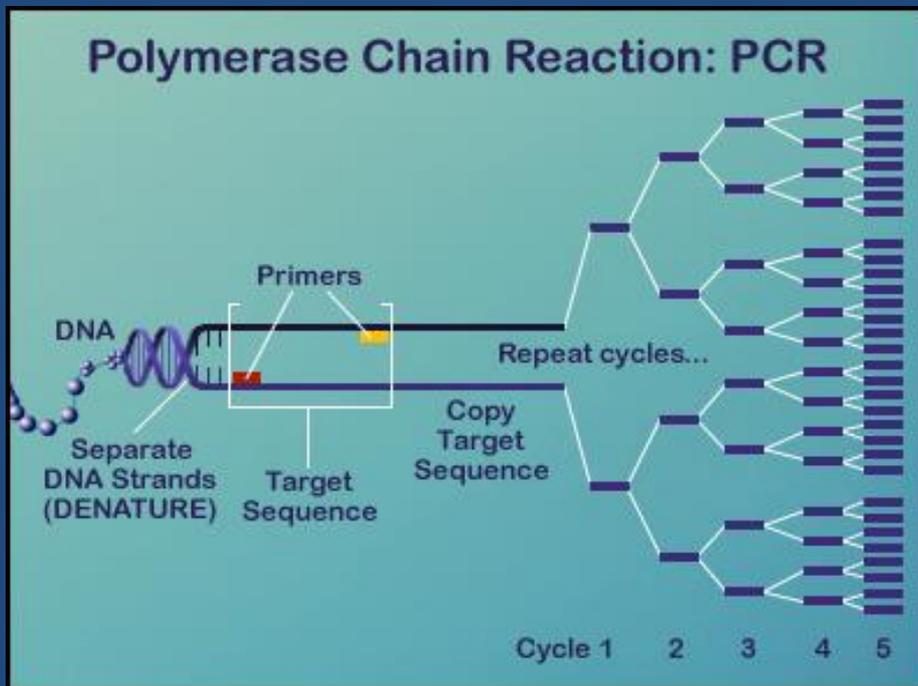
What should be done?

?



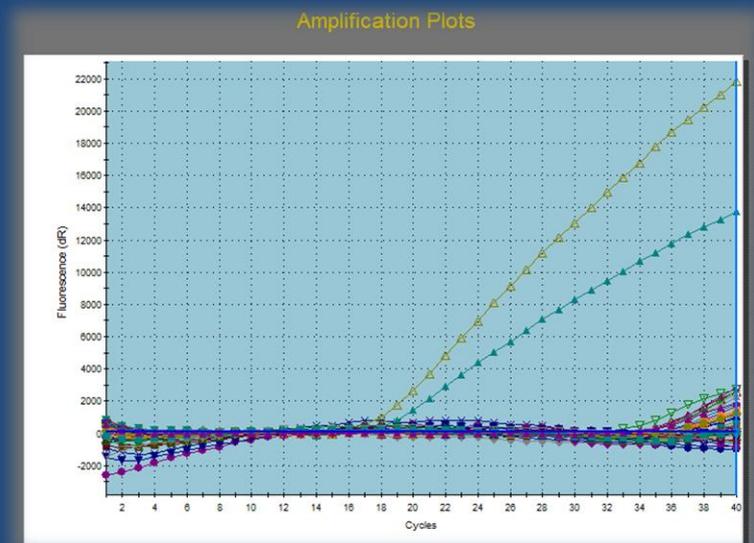
How do we do this? PCR assays

- Viruses
- Phytoplasmas
- Other organisms unculturable or difficult to culture



How do we do this? PCR assays

- PCR increases our level of detection-even latent pathogens
- Can detect a few organisms/target genes
 - Most viruses
 - Phytoplasmas
 - Bacteria
 - Fungi
- New primers can be designed & ordered within a few days



How to select plant samples

Selecting Plant Samples

- As much of the plant as possible
 - Roots, stems, leaves, soil, etc.
 - Dig samples, if possible
- Plants at different stages of disease, not just the worst
- Samples should be as fresh as possible



How to submit plant samples

- Ship overnight or next day
- Avoid shipping over the weekend
- Store samples in cool, dry conditions
- Wrap roots in damp towel, put in plastic bag
- Ship in a box



What to include with plant samples

- Fill out sample submission form
- Provide as much information as possible
- What, when, where, how....
- Pictures are very helpful
 - Close-ups
 - The Big Picture



OSU Hermiston

http://oregonstate.edu/dept/hermiston/

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Hermiston Agricultural Research and Extension Center

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Welcome!

The **Hermiston Agricultural Research & Extension Center** is located at 2121 South First Street in Hermiston, Oregon. Office hours are 8:00am - 5:00pm, Monday - Friday, closed during the lunch hour, noon - 1:00pm.

We serve nearly 500,000 acres of irrigated agriculture in Oregon and Washington's Columbia Basin. The center concentrates on discovery and implementation of agricultural and horticultural opportunities and provides solutions to production restraints. Research at HAREC emphasizes identification of new crops or and production practices, plant breeding and varietal evaluation including nutritional contents, integrated pest management of insects and insect transmitted diseases, plant disease control and environmental issues. In addition, an emphasis on stream ecology investigates aspects related to salmon. More about **HAREC**



Latest News

Pesticide Pre-Exam Workshop
Review for the private pesticide exam. February 11 & 12. Pre-registration is required.



Oregon's Agricultural Progress
The research magazine for Oregon State University Agricultural Experiment Station



Ask an Expert
Addressing real-life questions with research-based answers... Ask an Expert at Oregon State University.



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Social Media

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Hermiston Plant Pathology Diagnostic Lab

<http://oregonstate.edu/dept/hermiston/plant-pathology-plant-lab-testing>

The screenshot shows a Firefox browser window displaying the website for the Hermiston Plant Pathology Diagnostic Lab. The browser's address bar shows the URL oregonstate.edu/dept/hermiston/plant-pathology-plant-lab-testing. The website header includes the OSU logo, navigation links for "Research", "Calendars", "Employee Resources", and "Statewide Locations", and a search bar. The main content area features a section titled "Plant Pathology Diagnostic Laboratory Services" with a detailed description of the lab's services, contact information for Robert Catling, and instructions for sample submission. Three images illustrate plant diseases: a yellowed and damaged leaf, a cross-section of a tuber with internal rot, and a green pea pod with yellowish spots. A sidebar on the right contains links for "HAREC Home", "Research Projects", "Social Media", and "LIFE. Get good at it." with various resource categories like Gardening, Small Farms, Food Preservation, Food & Nutrition, and 4-H, Family & Youth. The Windows taskbar at the bottom shows the time as 11:37 AM.

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Plant Pathology Diagnostic Laboratory Services

The Plant Pathology Laboratory on the Hermiston Agricultural Research and Extension Center is dedicated to providing plant disease diagnostic services to the agricultural industry of the Columbia River Basin and to greater Oregon. We employ traditional diagnostic techniques as well as modern technologies to diagnose diseases of crops being grown in the Pacific Northwest. The laboratory is equipped to test for a wide manner of plant pathogens including viruses, fungi, and bacteria. We also provide various specialty testing services for certain plant pathogens. More information about the services the HAREC Plant Pathology Laboratory provides, please review [OSU HAREC Plant Pathology Lab Testing Fees](#) or contact [Robert Catling](#), the Plant Pathology Laboratory manager, at (541) 567-8321.

Plant or soil samples can be submitted to the lab by either bringing the sample directly to the HAREC Plant Pathology Lab or the HAREC Main office or by mailing samples to:

Robert Catling
OSU Extension Plant Pathology Lab
HAREC
2121 South 1st Street
Hermiston, OR 97838



To make an accurate and timely disease diagnosis, it is important that plant disease samples being sent to the lab arrive in the best condition possible. Please review [Directions for Sample Submission to HAREC Plant Pathology Lab](#) for proper preparation of samples being shipped to the lab. Proper and timely diagnoses also require as much background information about the disease sample as possible. It is important that a completed Plant Pathology Sample Submission form accompany all samples submitted to the Plant Pathology Lab. Please download or print the OSU HAREC Plant Pathology [Sample Submission Form](#), fill it out as completely as possible, and included it with samples. Links to all forms can be found below.



Links:

[Disease Images](#)

[OSU HAREC Plant Pathology Lab Testing Fees](#)

[Directions for Sample Submission to HAREC Plant Pathology Lab](#)

[OSU HAREC Plant Pathology Sample Submission Form](#)



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LIFE. Get good at it.

Gardening

Small Farms

Food Preservation

Food & Nutrition

4-H, Family & Youth

OSU Plant Clinic, Corvallis

<http://plant-clinic.bpp.oregonstate.edu/>



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Carrot blackening root rot

OSU Plant Clinic

College of Agricultural Sciences

Services and fees
How to submit a sample
Directions to clinic
Personnel
Contact information

Information on plant diseases
OSU Online Guide to Plant Disease Control
Fact sheets
Diagnoses by county
Monthly highlights
Problems of Stored Garlic
Rhodococcus and Agrobacterium
Grapevine Trunk Diseases
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PNW Plant Disease Management is on facebook 
Local News Items and Resources

Welcome to the OSU Plant Clinic

The **Oregon State University Plant Clinic** is a diagnostic facility associated with and housed in the **Department of Botany and Plant Pathology**. The Plant Clinic has been operational since 1954. As part of the OSU Cooperative Extension Service, the primary mission of the Plant Clinic is educational. Extended education is provided by helping our clients recognize the nature of their plant problem (diagnosis) and by helping them to manage the disease or disorder using proper control methods, including cultural, biological, and chemical measures. Emphasis is on prevention of problems by proper management.

Our clients include individual growers; field representatives of chemical and fertilizer companies and food processors; home gardeners; and employees of State and Federal organizations in Oregon.

In 2003 the Plant Clinic became part of the newly established National Plant Diagnostic Network (NPDN), and shortly thereafter it was designated an expert laboratory for the Western Region of the NPDN. As such the Plant Clinic serves as a resource lab and conducts specialized tests for Oregon, Washington, Idaho, and Alaska.

In 2003 the Plant Clinic also joined forces with OSU's Insect Identification Service. Now all insect, arthropod, mollusk, and plant samples come to one location.



Related websites and links
[Department of Botany and Plant Pathology](#)
[OSU Insect ID Clinic](#)
[OSU Nematode Taxonomy Service](#)
[Plant/Weed Identification](#)
[Sample Submission Form](#)
[NPDN](#)
[WPOH](#)
[NAPPO](#)

Monthly Highlights
[October Highlights](#)



Rain will begin soon.....

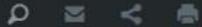
Oregon State University, OSU Plant Clinic, 1089 Conley Hall, Corvallis, OR 97331-2903 · 541-737-3472
[Contact us with your comments, questions and feedback](#)

WSU Puyallup Plant Diagnostic Lab

<http://puyallup.wsu.edu/plantclinic/>



WASHINGTON STATE
UNIVERSITY



🏠 **About the Plant Clinic**

Submitting Samples

Services

FAQs

Resources

Links

Puyallup Research &
Extension Center

myWSU ACCESS POLICIES

PLANT & INSECT DIAGNOSTIC LABORATORY About the Plant Clinic

The Washington State University Puyallup Plant & Insect Diagnostic Laboratory is committed to helping the citizens of Washington State resolve their troubles with plants and insects through accurate problem diagnoses. We also provide applicable management options to a numerous state clientele like commercial growers, pest control operators, home gardeners, consultants, county agents, Master Gardeners, and research personnel.



Jenny Glass

Diagnostic Plant Pathologist
Washington State University
Puyallup Research & Extension
Center

2606 West Pioneer
Puyallup, WA 98371-4998

☎ 253-445-4582

📠 253-445-4569

The laboratory is currently equipped to handle samples from Washington State, particularly western Washington State, and not from other areas of the country.

To achieve an accurate diagnosis of the problems, samples should be accompanied by detailed information about the problem. Go to [How to Submit a Sample](#) for additional information. *Services will not be provided without payment of diagnostic fees.*



**PLEASE NOTE: WE CANNOT ACCEPT CANNABIS SAMPLES
DUE TO WSU COMPLIANCE WITH FEDERAL POLICY.**

WSU Plant Pest Diagnostic Clinic, Pullman

<http://plantpath.wsu.edu/diagnostics/>

Department of Plant Pathology

Share Print Search

WSU Plant Pest Diagnostic Services

**** Attention: The Pullman clinic is currently in transition and will not be accepting samples after August 29, 2014. ****

We will update the site with new details as soon as they are available.

Please refer to the following paragraph to locate other diagnostic clinics.

Thank you.

During this closure, you are invited to visit the following website for information on weed identification:

<http://css.wsu.edu/research/weedscience/weed-identification/>

Washington State University operates two Plant Pest Diagnostic Clinics, in Puyallup and in Pullman. Services of either clinic are available to clients statewide; however, the [Puyallup Clinic](#) generally handles samples from western Washington, while samples from eastern Washington are usually submitted to Pullman. Both Clinics offer diagnosis of plant diseases and disorders, insect and arthropod identification, and plant/weed identification. Identifications and diagnoses are accompanied by management recommendations when appropriate. Services provided by the WSU diagnosticians are [fee-based](#). **The WSU Clinics are able to process samples from Washington State, but not from other areas of the country.** For a listing of Clinics in other states, see [Other Diagnostics Resources](#).

Digital Diagnostics: Clients with PPDeN accounts may submit information *and high-quality photos* via the [Plant Pest Diagnostic eNetwork \(PPDeN\)](#). Digital sample submission typically allows a more timely response. Digital samples also guide the diagnostician when instructing the client how to submit a physical sample of the plant problem. Those wishing to use PPDeN must have a user account, which may be applied for on the PPDeN website. A [webinar](#) on using PPDeN is available here, or may be accessed through the PPDeN website by account holders.

Reopening
December
2015

plant.clinic@wsu.edu

Diagnostic Forms



Extension Plant Pathology
Oregon State University
Hermiston Agricultural Research &
Extension Center
2121 South 1st Street
Hermiston, OR 97838
541-567-8321

HAREC Plant Pathology Sample Submission Form

Office use:
Date Rec. _____
PCE# _____

Grower: _____ **Submitter:** _____

Street: _____ **Street:** _____

City: _____ **State:** _____ **Zip:** _____ **City:** _____ **State:** _____ **Zip:** _____

County: _____ **County:** _____

E-mail: _____ **E-mail:** _____

Telephone: _____ **Fax:** _____ **Telephone:** _____ **Fax:** _____

Bill to (Must check one): Grower Submitter (General Sample Fee: \$80.00; additional fees may apply)

Send results to (Please check all that apply): Grower Submitter **Send results via:** E-mail Mail Fax

Host/Plant: _____ **Variety:** _____

Date Planted: _____ **Number of years at present site:** _____

Previous crops: _____

Acreage: _____ **% Affected:** _____ **Number of plants affected:** _____

Exposure: full sun partial shade full shade windy protected

Distribution of affected plants: single plants grouped scattered edge of field

Soil characteristics: sandy clay silt loam organic hard pan

Irrigation type and frequency: _____

Fertilizer Applications (product, rate, frequency): _____

Pesticide Applications (Insecticides, Fungicides, Herbicides, rates, frequency, etc.): _____

Date damage was first noticed: _____

Symptoms: Circle all that apply.

Leaves		Stems		Fruit		Roots	
Wilted	Misshaped	Stunting	Wilted	Spots	Holes	Rotten	Stunting
Yellowing	Curling	Spots	Misshaped	Misshaped	Sticky	Discolored	Sparse
Chlorosis	Spots	Brittle	Cracks	Discolored		Shallow Growth	Dry/Brittle
Browning	Discolored	Streaking	Lodging	Rotten		Misshaped	
Early Drop	Tattered	Exuding Sap		Streaking		Easily Uprooted	
Brittle	Mosaic	Holes		Early Drop		Bumps	
Rotting		Discolored		Cracks		Streaking	

Additional Symptoms:

Send sample(s) and completed form to:
WSU Puyallup Research & Extension Center
Plant & Insect Diagnostic Lab
2606 West Pioneer
Puyallup, WA 98371-4998



For Official Use Only

PC No. _____ Date Received _____ Fee _____

Submitter/Company name _____ **Daytime phone** _____ **County** _____

Mailing address _____ **City** _____ **State/Zip** _____
WA

E-mail address _____ **Send results via:**
 E-mail Mail

Client name _____ **Daytime phone** _____ **County** _____

Mailing address _____ **City** _____ **State/Zip** _____
WA

E-mail Address _____ **Send results via:**
 E-mail Mail

I agree to pay a minimum charge of \$40.00 for diagnostic services. Certain diagnostic tests may result in additional fees. For a full schedule of fees, please contact puy.plantdiagnostic@wsu.edu or 253-443-4582. *Samples submitted without a signature will not be processed.

Signature* _____

Print Name _____

Submission date _____

This form must be filled out completely. Follow instructions on the back of this form for sending samples. Please send sufficient material to show the complete range of symptoms. Photos may be e-mailed to puy.plantdiagnostic@wsu.edu.

Plant/Crop affected: _____

Variety: (if known) _____ **Type of planting:** _____
___ Commercial ___ Garden

Acreage or number of plants affected: _____ **Percentage of plants affected:** _____
 100 75 50 25 10 1

How much of each plant is affected? _____

Are other kinds of plants similarly affected? What types?
 Yes No

When did you first notice symptoms? _____

Plant parts affected:
 Leaves Stems Roots Twigs Large branches
 Buds Flowers Trunk Fruit

Symptoms:
 Yellowing Bleeding Wilted Canker Deformed
 Red Galls Drop Stunting Decayed
 Dead spots Dead Other: _____

Distribution:
 Single plant Scattered plants Groups of plants
 Most of field On slopes In low areas

What were weather conditions the previous week? _____

COMMERCIAL PLANT DISEASE IDENTIFICATION



Questions?



Acknowledgements:

PNVA

www.pnva.org

PNW-VEG

http://mtvernon.wsu.edu/path_team/vegpath_team.htm