Vegetable Crop Management 101 Workshop

Pacific Northwest Vegetable Extension Group & Pacific Northwest Vegetable Association
11/17/2015, 1-5 pm, Kennewick Convention Center, WA

Diagnosing Crop Problems & Submitting Crop Samples for Diagnosis

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Vegetable Crop Diagnosis-
Determine the Cause of Plant Problems:

Abiotic Stresses (environment, nutrients, chemicals, mechanical injury, etc.)
Pathogenic Diseases (fungi, bacteria, viruses, nematodes, phytoplasmas)
Arthropod Pests (piercing-sucking insects and mites, chewing insects)

What to Look For:

a) Symptoms – abnormal appearance of the plant, the type(s) of damage occurring on the plant such as stunting/death/discoloration
b) Signs - physical evidence of insect or mite pests, or the presence of fungal growth, such as mycelium, sporulation structures, or survival structures, like sclerotia
c) Patterns of damage to the crop & connections to events during the cropping season
d) Timing of the problem - When did the problem start? Does the problem appear to be spreading on the plant or among plants in the crop?

Testing Methods Used

a) Observation: visual & microscopic
b) Culture fungal & bacterial pathogens onto sterilized laboratory agar media
c) Use specialized test methods, such as polymerase chain reaction (PCR) or enzyme-linked immunosorbent assay (ELISA), to confirm or identify pathogens not readily observable or those unable to be cultured on agar media

How to Submit a Sample:

a) Collect plant tissue showing a range of symptoms and representing as much of the plant as possible
b) Ship the samples as quickly as possible to keep samples fresh for diagnosis
c) Protect samples from deteriorating in transit (store cool, wrap roots separately from the rest of the plant, mail in a sturdy box/container so the samples aren't crushed during shipping)
d) Include detailed information about the crop & problem history by completing a diagnostic form
e) Send pictures to provide additional information about the appearance & distribution of the problem

Pacific Northwest University Diagnostic Laboratories:

OSU Hermiston AREC Plant Pathology Lab, Hermiston, OR
http://oregonstate.edu/dept/hermiston/plant-pathology-plant-lab-testing
Diagnostician: Dr. Robert Cating, (541) 567-8321
The Plant Pathology Lab at the OSU Hermiston Agricultural REC is dedicated to providing plant disease diagnostic services to the agricultural industry of the Columbia River Basin and to the greater area of Oregon. The lab employs traditional diagnostic techniques as well as modern technologies to diagnose diseases of PNW crops. The laboratory is equipped to test for all manner of plant pathogens including viruses, fungi, and bacteria, and also provides various specialty pathogen testing services.

OSU Plant Clinic, Corvallis OR: http://plant-clinic.bpp.oregonstate.edu/
Diagnosticians: Melodie Putnam & Maryna Serdani, (541) 737-3472
As part of OSU Extension, the primary mission of the Plant Clinic is plant diagnosis and education. Extended education is provided by helping our clients recognize the nature of their plant problems (diagnosis) and by helping clients manage the diseases or disorders using proper control methods, including cultural, biological, and chemical measures. Emphasis is on prevention of problems by proper management. The lab is equipped to handle diagnosis of both abiotic and living (pathogen and arthropod pest) causes, and provides several pathogen-specific types of testing.

WSU Plant Pest Diagnostic Clinic, Pullman, WA: http://plantpath.wsu.edu/diagnostics/
Diagnostician: Rachel Bomberger, (509) 335-0619
This clinic is reopening in December 2015 under the leadership of Rachel Bomberger, who has worked as a diagnostician for the Nevada Dept. of Agriculture since earning her MS degree in Plant Pathology at Oregon State University in 2013.

WSU Puyallup Plant Diagnostic Lab: http://puyallup.wsu.edu/plantclinic/
Diagnostician: Jenny Glass, (253) 445-4582
The WSU Puyallup lab focuses on abiotic stresses, arthropod damage, and fungal and bacterial diseases using traditional methods of observation and pathogen culturing onto sterilized laboratory agar media. The focus is to provide clientele with integrated pest management recommendations to prevent or solve plant problems.

Select Resources for Vegetable Problem Diagnostics:
For more information on local vegetable diseases and pests, please see the PNW VEG Extension Group website at:
http://mtvernon.wsu.edu/path_team/vegpath_team.htm

Other Analytical Labs serving PNW Agriculture:
http://archive.puyallup.wsu.edu/analyticallabs/
https://catalog.extension.oregonstate.edu/sites/catalog.extension.oregonstate.edu/files/project/pdf/em8677.pdf

Select Vegetable Pathology References:
PNW Plant Disease Management Handbook: http://pnwhandbooks.org/plantdisease/
PNW Insect Management Handbook: http://insect.pnwhandbooks.org/
American Phytopathological Society **Compendia of Crop Diseases and Pests** Series - variety of crops covered including potato, onion and garlic, carrot, bean, lettuce, pepper, tomato, corn and sweet corn, etc.)
Koike, S.T., Gladders, P, and Paulus, A.O. **Vegetable Diseases A Color Handbook.** Academic Press, 2007.
Howard, R.J., Garland, J.A., and Seaman, W. L. **Diseases and Pests of Vegetable Crops in Canada**, Entomological Society of Canada, 1994.