College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-GEN-15**

Considerations for Diagnosis of Ornamentals in the Landscape

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Diagnosing plant problems can be challenging. A site visit can provide the information necessary for a complete and accurate diagnosis. However, once on-site, it is important to know how to proceed. The following guidelines are intended to assist in the process of gathering pertinent information and determining a possible cause. Often abiotic conditions such as environment, mechanical damage, or living organisms like insects or wildlife may be to blame. Should the field site diagnosis be inconclusive and samples need to be submitted to the UK Plant Diagnostic Laboratories, the information gathered here can provide valuable supplementary information.

Step 1: Begin the Evaluation

At the start of the evaluation, consider the following:

- Plants affected (including cultivars)
- Normal appearance and growth patterns of plants
- Location of plants
- Plant height
- Planting date/Age of plant
- Planting depth
- Soil type
- Watering program
- Drainage
- Sun exposure
- Use of lawn service
- Fertilizers applied (dates applied)
- Fungicides/Insecticides/Herbicides applied (dates and rates applied)

When assessing a plant problem, it may be helpful to take photos of the affected plant and surrounding area. Should a sample need to be submitted to the diagnostic laboratory, these images may assist in the diagnostic process. The following are suggestions, but other pictures may be needed depending upon the situation.

- Close-up of affected plants
- Close-up of plant symptoms
- Wide view of affected plants
- Wide view of area around affected plant

Figure 1. Photos that include the entire plant and close-ups of plant parts (inset) are helpful in the diagnostic process.

Step 2: Examine the site

(More than one may apply)

Type(s) of Plants Affected

- ☐ Only one plant of its type is affected; others are healthy
- ☐ Multiple plants all of the same type are affected
- ☐ Multiple plant species are affected
- ☐ Entire planting (all plants)
- ☐ Comments/other:

Look for a Pattern

- ☐ Near neighbor's property
- ☐ Near house foundation
- ☐ One section or side of property
- ☐ Shady areas only
- ☐ Sunny areas only
- ☐ Follows drainage patterns
- ☐ Groups of plants
- ☐ Comments/other:

Look at the Topography

- ☐ Low area(s)
- ☐ High area(s)
- ☐ Slopes
- ☐ Compacted (e.g. due to foot traffic, vehicles, equipment)
- ☐ Hard pan or underlying rock (probe soil with narrow spike)
- ☐ Comments/other:

Consider Site/Plant History

- ☐ Deicing salts applied nearby (sidewalks, driveways, roads)
- ☐ Fertilizer applications
- ☐ Grade change (soil added or removed)
- ☐ Herbicide applications
- ☐ Irrigation practices
- ☐ Recently transplanted
- ☐ Site disturbance (construction, digging, utility lines)
- ☐ Weather extremes in past (cold, drought, flooding) – Check KY MESONET for past weather patterns
- ☐ Weather extremes recently (flooding, drought, hail, lightning)
- ☐ Comments/other:

Figure 2. Assess type(s) of plants affected and sites for a pattern.

Figure 3. Grade changes (addition or removal of soil) can adversely affect tree health.

Figure 4. Consider irrigation practices, topography, and soil drainage.

Step 3: Examine the whole plant

(More than one may apply)

Symptom Progression Timeline

- ☐ Gradual progression of symptoms
- ☐ Rapid progression of symptoms
- ☐ Symptoms reoccur most years
- ☐ No symptoms observed prior to current season
- ☐ Comments/other:

Symptom Progression

- ☐ Top branches moving down toward lower branches
- ☐ Lower branches moving up toward upper branches
- ☐ Tips of branches toward trunk
- ☐ Trunk outward toward branch tips
- ☐ Comments/other:

Distribution of Symptoms

- ☐ Uniform over entire plant
- ☐ New leaves/shoots
- ☐ Older growth
- ☐ Upper portion of plant
- ☐ Lower portion of plant
- ☐ One side of plant
- ☐ Single branch or limb of tree
- ☐ Entire tree/shrub
- ☐ Comments/other:

Other Observations

- ☐ Wire, string, or other material embedded in trunk or branch
- ☐ Excessive mulch (volcano mulching) around trunk
- ☐ Mature tree lacking in buttress flare (check for girdling root)
- ☐ Suckers emerging from ground, trunk, or branches
- ☐ Comments/other:

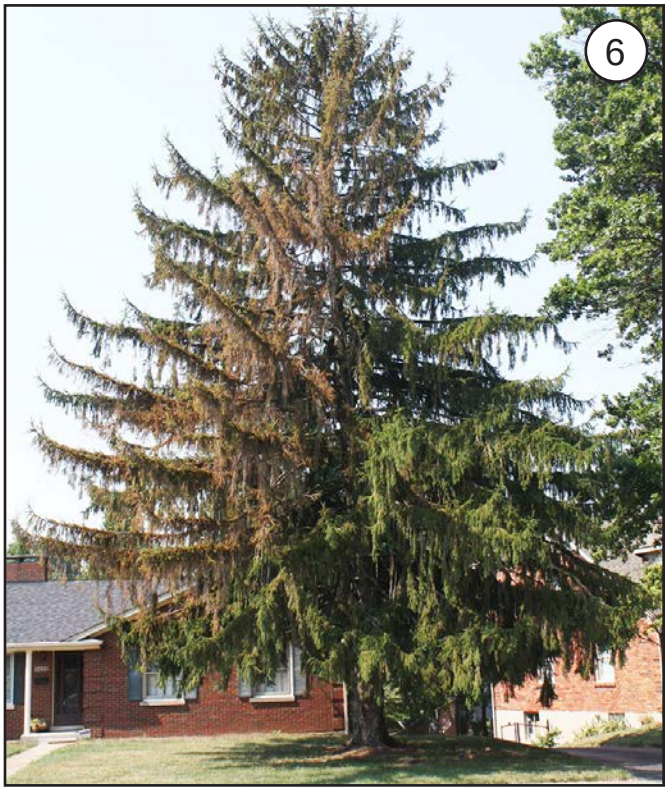

Figure 5. Symptoms may progress from the tips of branches towards the trunk.
Figure 6. Symptoms may be concentrated on one side of the plant.
Figure 7. Circling roots can girdle trunks.

Step 4: Identify the Symptoms & Possible Cause

(More than one may apply)

Leaf Symptoms

- ☐ Bumps or growths
  - Arthropod (e.g. eriophyid mite, parasitic wasps)
  - Fungal leaf gall
- ☐ Holes in leaves
  - Insect (Chewing or feeding damage)
  - Leaf spot diseases
  - Hail damage
- ☐ Defoliation or premature leaf drop
  - Leaf spot (fungal or bacterial)
  - Root/trunk-related disease
  - Root/trunk-related abiotic problem
- ☐ Discoloration (yellowing, chlorosis, reddening)
  - Nutritional deficiency or excess
  - Root/trunk-related disease
  - Root/trunk-related abiotic problem
- ☐ Distorted, twisted, curled
  - Environmental problems (e.g. cold) at budbreak
  - Herbicide injury
  - Infection during budbreak (e.g. anthracnose, leaf spot, fire blight)
  - Downy mildew (systemic)
  - Powdery mildew (visible fungal growth)
  - Nutritional deficiency
- ☐ Fuzzy or powdery growth on surface
  - Powdery growth: powdery mildew
  - Fuzzy growth: Botrytis, downy mildew
- ☐ Leaf spots, blotches, lesions
  - Fungal or bacterial leaf spot
  - Nutritional (e.g. interveinal spots develop with iron deficiency)
  - Herbicide injury
- ☐ Mosaic or mottling
  - Virus disease
  - Herbicide injury
- ☐ Rapid death/blight
  - Cultural or environmental factors
  - Fungal or bacterial leaf blight disease
  - Root restrictions
  - Root decay
  - Vascular wilt
- ☐ Scorch or burn; brown leaf margins or needle tips
  - Drought
  - Root restrictions
  - Root decay
  - Vascular disease
  - Root/trunk-related
  - Excessive fertilizer
  - Bacterial leaf scorch
- ☐ Sooty black growth covering surfaces
  - Fungal growth on honeydew excretions of some insects (e.g. aphids)
- ☐ Sticky substance on surface
  - Honeydew from some insects (e.g. aphids)
- ☐ Stunted/undersized foliage
  - Nutritional problems
  - Root-related abiotic issues
  - Root decay
  - Vascular diseases
  - Cultural/environmental issues
- ☐ Wilting or drooping
  - Vascular disease
  - Root decay
  - Root/trunk-related restrictions
  - Wound or injury
  - Drought

Figure 8. Mosaic or mottling symptoms include abnormal color variations across leaves.

Figure 9. Distorted growth can appear twisted or curled.

Step 4: Identify the Symptoms & Possible Cause (cont'd)

(More than one may apply)

Branches/Stems/Trunk Symptoms

- ☐ Callus formation evident
  - Evidence of prior wound or canker
  - Evidence that tree is attempting to seal the wound
- ☐ Cankers or lesions
  - Fungal or bacterial disease
  - Mechanical injury (e.g. mower, string trimmer)
- ☐ Cracks, wounds, loose bark
  - Wood decay
  - Sunscald or freeze injury
  - Mechanical injury (e.g. construction, mower, string trimmer)
- ☐ Dieback, slow decline, thinning canopy
  - Vascular pathogens (e.g. Verticillium wilt, bacterial scorch)
  - Root-related (disease or abiotic)
  - Environmental stress
  - Transplant shock
- ☐ Galls, swellings, or burl
  - Insects
  - Fungi (e.g. back knot, azalea gall, rusts)
  - Bacteria (e.g. crown gall)
- ☐ Holes or insect tunnels
  - Borers (e.g. emerald ash borer, bark beetles)
  - Sapsuckers
- ☐ Mushrooms or bracket fungi present
  - Wood decay
  - Wood decay often follows decline due to stress
- ☐ Oozing sap
  - Disease pathogen (e.g. *Phytophthora* or bacterial wetwood)
  - Physical injury
- ☐ Pruning stubs/topped
  - Entry points for wood decay
- ☐ Sawdust or frass
  - Insects
- ☐ Staining or streaking of inner branch tissue
  - Vascular diseases (e.g. oak wilt, Verticillium wilt)

Figure 10. Cankers are sunken woody lesions.
Figure 11. Dieback often includes slow decline or canopy thinning.
Figure 12. Staining or streaking under the bark can be indicative of a vascular wilt disease.

Step 4: Identify the Symptoms & Possible Cause (cont'd)

(More than one may apply)

Root Symptoms

- ☐ Black lesions or browning/root decay
  - Excessive mulch
  - Synthetic burlap over roots
  - Root disease
  - Poor Drainage
  - Flooding
- ☐ Girdling root
  - Poor planting practices
- ☐ Restricted roots/stunted roots
  - Inhibited growth due to sidewalk, road or other obstruction
  - Compaction

Step 5: Conclusion

After assessment of the affected plant and surrounding area, it may be necessary to submit a sample to a University of Kentucky Plant Disease Diagnostic Laboratory. Information gathered using this guide may be helpful to include with the submission form. For information on sample submission, see *Submitting Plant Specimens for Disease Diagnosis* (PPFS-GEN-09).

Figure 13. Healthy roots (left) are more numerous and lighter in color than decayed roots (right).
Figure 14. Synthetic burlap left on root balls at planting restricts root growth.

Resources

- Plant Pathology Extension Publications

http://plantpathology.ca.uky.edu/extension/publications

- Entomology Extension Publications

https://entomology.ca.uky.edu/entfacts

- Horticulture Extension Publications

http://www.uky.edu/hort/

- Submitting Plant Specimens for Disease Diagnosis (PPFS-GEN-09)

https://plantpathology.ca.uky.edu/files/ppfs-gen-09.pdf

- Kentucky Mesonet (Western Kentucky University)

http://www.kymesonet.org/

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