Diagnosing Tree Problems on Stems and Roots

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- decline problems
- holes in bark
- problems of dead limbs
- sudden tree death
What to Look For in Tree Health

Tree vigor
Leaf cover, leaf size, and condition

Flowers
Compare to other similar trees
Dieback vs. Decline
WHAT CAUSES DIEBACK OR DECLINE?

- Abiotic factors
- Insects
- Fungi
- Bacteria
- Viruses, Mycoplasmas
- Nematodes
SITUATION:

STUNTED GROWTH, OFF-COLOR FOLIAGE, GRADUAL DECLINE
The problem: roots are “smothered” due to lack of oxygen, and cannot grow
Compacted Soil (and Too Deep)

A secondary problem of compaction: root disease caused by *Phytophthora cactorum*.
Over or Under-Watering

Symptoms for both may be similar:

- thin crown
- yellowing/scorch
- leaf drop
- dieback
GIRDLING ROOTS

How They Happen:

- Planting in a hole that is too small so the roots can not easily spread out.
- Planting container grown trees that have roots growing in a circular pattern.
- Planting a bare root tree by twisting roots to fit into a small hole.
- Leaving wire baskets, burlap and any part of a container in the planting hole.
Girdling roots - Removing

- Expose girdled roots and remove as much topsoil as possible
- Use a hand saw, chain saw or sawzall to remove roots up to 4 inches in diameter from around the crown of the tree.

Prevent girdled roots by loosening root balls and finding root collar during planting.
Root Rot

Symptoms

- Fungal fruiting structures
- Dead/loose bark
- Cracks or seams in bark
- Bleeding or ooze
- Missing roots
- Stunted growth
- Off-color foliage
- Pattern in stand of trees
**Armillaria Root Rot**

- **Causal agent:** *Armillaria ostoyae*

- **Hosts:** hundreds of species; conifers
RECAP OF DECLINE CAUSES

Planted too deep/buried
Compacted soil
Too much or too little water
Bound roots/girdling roots
Root rot
Canker on main stem
Wrong tree for the site
SITUATION:

HOLES IN BARK
MOUNTAIN PINE BEETLE GALLERY
Bark Beetles - *Ips*
IPS ENGRAVER GALLERY
Borers - Clearwing Poplar
BORERS - LILAC/Ash CLEARWING
Borers - Shothole
Borers - Flatheaded
RECAP OF HOLES IN BARK

Bark beetles:
- conifers
- attack in large numbers; cause mortality

Borers:
- hardwoods
- attack singly; cause localized damage

Sapsuckers/woodpeckers
SITUATION:

DEAD BARK AND DYING LIMBS
CANKERS

- A sunken area of dead tissue on the inner wood and bark

- Can be *annual* (pathogen active in one season, and usually kills host) or *perennial* (pathogen grows every year, and host produces callus tissue)
CANKERS- Perennial
**CANKERS**

- **Causal agent:** Many
- **Hosts:** hundreds of woody plant species
- **Symptoms:** gumming/oozing at cankered area, sunken/dead bark, flaking/loose bark, dieback, epicormic branching
CANKERS - Apple Anthracnose (*Pezicula malicorticis*)
CANKERS- Bacterial Canker (Pseudomonas spp.)
CANKERS - Bacterial Canker (Pseudomonas spp.)
CANKERS - Cytospora
MECHANICAL INJURY
Mechanical Injury
Frost Crack
Sunscald/Southwest Injury
Sunscald/Southwest Injury
INTERNAL DECAY

Loose bark
Abnormal swellings especially at base of tree
Fungus fruiting structures (conks)
Stump sprouts
Branch stubs
Cavities
INTERNAL DECAY
GALLS

Crown Gall

- **Causal agent:** *Agrobacterium tumefaciens*
- **Hosts:** hundreds of trees and shrubs including fruit trees
A NOTE ON BURLS
**Verticillium Wilt - Chronic**

- **Causal agent:** *Verticillium albo-atrum* or *V. dahliae*

- **Hosts:** wide variety: maple, ash, dogwood, linden, catalpa, magnolia, sumac, viburnum

- **Symptoms:** marginal yellowing of foliage; wilting during day/recovery at night; early fall color; dieback; slow death
RECAP OF DEAD BARK/DYING LIMBS PROBLEM

Cankers
Mechanical injury
Frost injury
Sunscald/Southwest injury
Internal decay fungi
Galls
Wilt
Insects
SITUATION:

SUDDEN TREE DEATH
Root Rot - Crown and Collar Rot

- **Causal agent:** many species of *Phytophthora*, including *P. cactorum*, *P. megasperma*, *P. cambivora*, and others

- **Hosts:** apple, stone fruits, a variety of hardwoods

- **Symptoms:** reduced vigor, leaf discoloration, small fruit, oozing cankers at the base of the tree, discolored inner bark, death
PHYTOPHTHORA

Utah State University
Cooperative Extension
Phytophthora
Bark Beetles
Fire Blight
RECAP OF SUDDEN TREE DEATH CAUSES

- Root rot
- Bark beetle attack
- Wilt
- Fire blight
- Herbicide injury
- Chainsaw
RECAP OF SAMPLE DIAGNOSIS

Coryneum blight
Cytospora canker
Flatheaded appletree borer
Phytophthora collar rot
Utah's diverse landscape supports thousands of insects and plant pathogens. **UTAH PESTS** is your portal for learning more about pests and their beneficial counterparts around the state, and how Utah Extension personnel are working to provide a greater understanding of these organisms in our world.

Click on one of the web site links below to get started!

**Integrated Pest Management**

Choose this site for the pest advisories, the PM Mini-Grant program, weather data, and much more.

**Plant Diseases**

Choose this site for a multitude of fact sheets on diseases and disorders of field crops, fruits, ornamentals, turf, and vegetables.

**Insects and Their Relatives**

This site will help to shed some light on the insect world, with fact sheets, images, slide shows, and more.

**Utah Plant Pest Diagnostic Lab**

The UPPDL, the only lab of its kind in Utah, is here to identify and provide management recommendations for your pest problems.
IPM Advisories:

Landscape
Tree Fruit
Small Fruit/Vegetable
Turf

To sign up:
[utahpests.usu.edu/ipm](http://utahpests.usu.edu/ipm)
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