

# 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



# TERMINOLOGY

- Dieback vs. Decline

# WHAT CAUSES DIEBACK OR DECLINE?

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

**SITUATION:**

**STUNTED  
GROWTH, OFF-  
COLOR  
FOLIAGE,  
GRADUAL  
DECLINE**



# PLANTED TOO DEEP/BURIED



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

# ARMILLARIA



# ARMILLARIA – Honey Mushrooms



# ARMILLARIA – Mycelial Fan





# 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**



# BARK BEETLES – MOUNTAIN/WESTERN PINE BEETLE



# MOUNTAIN PINE BEETLE GALLERY



# BARK BEETLES - *IPS*



# IPS ENGRAVER GALLERY



UGA2108031

# SPRUCE BEETLE GALLERY



UGA1468383

# BORERS – CLEARWING POPLAR



# BORERS – LILAC/ASH CLEARWING



# BORERS - SHOTHOLE



# BORERS - FLATHEADED



# SAPSUCKER



# 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-Annual



# 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 (*Pezizicola malicorticis*)



CANKERS-Bacterial Canker (*Pseudomonas* sp.)



CANKERS-Bacterial Canker (*Pseudomonas* sp.)



# CANKERS-Cytospora



# CANKERS-Cytospora



# CANKERS-Cytospora



# 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

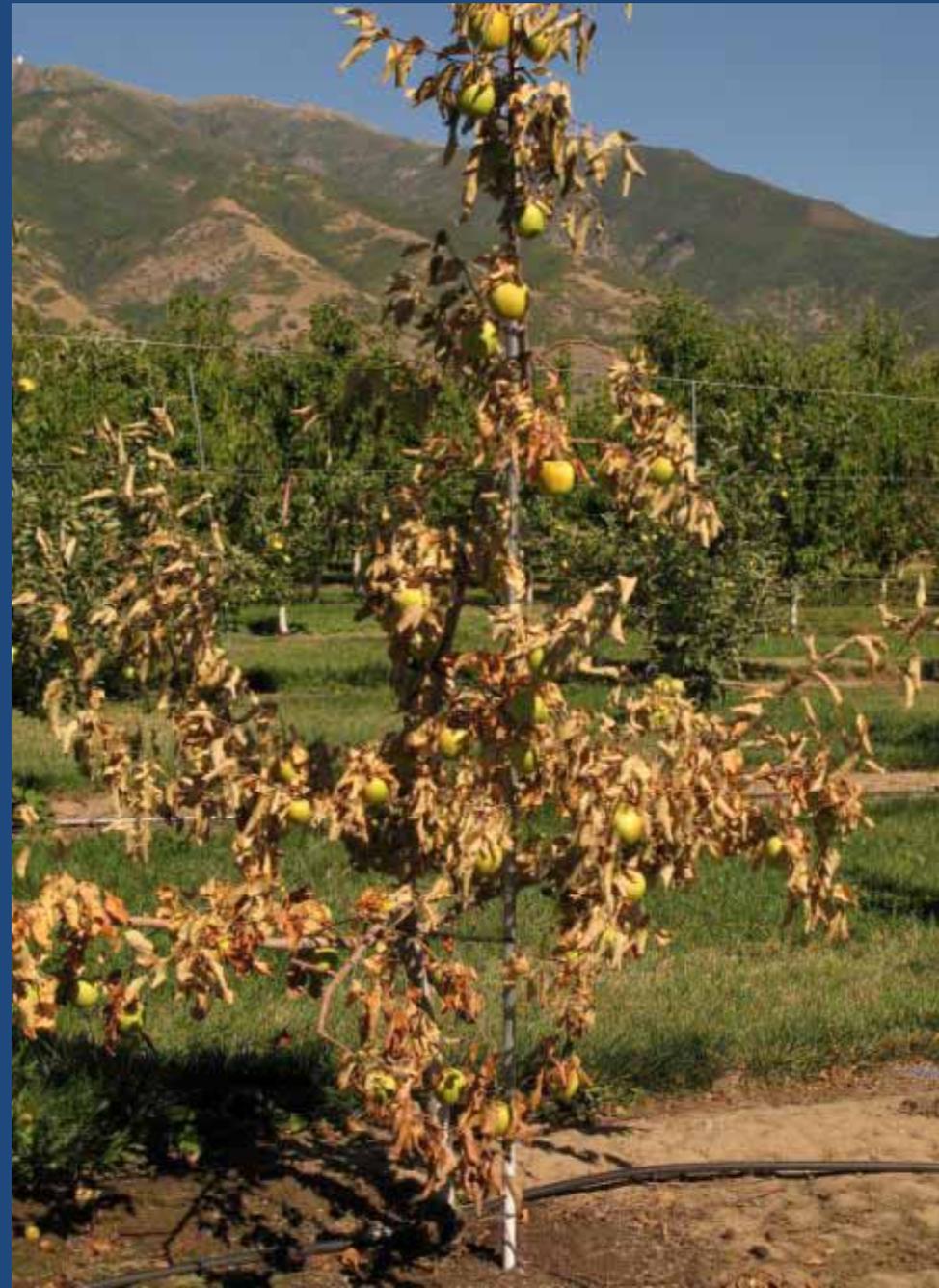
Galls

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



# PHYTOPHTHORA



# BARK BEETLES



# VERTICILLIUM WILT



# FIRE BLIGHT



# RECAP OF SUDDEN TREE DEATH CAUSES

Root rot

Bark beetle attack

Wilt

Fire blight

*Herbicide injury*

*Chainsaw*

# SAMPLE DIAGNOSIS















# RECAP OF SAMPLE DIAGNOSIS

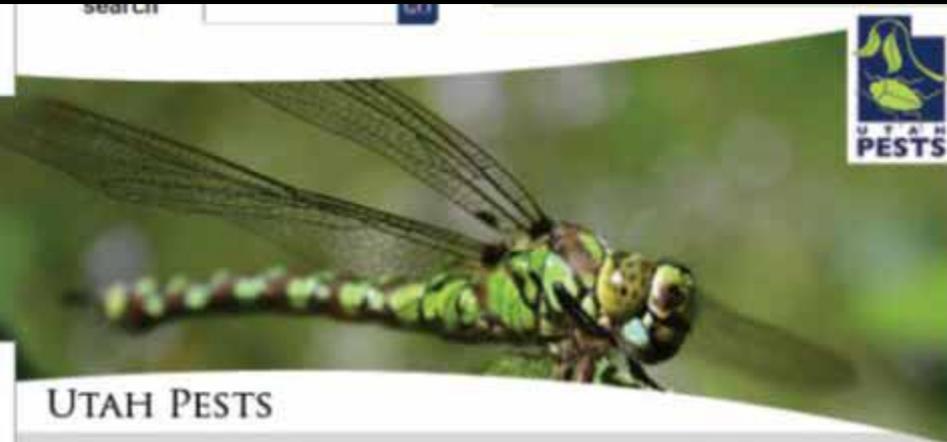
**Coryneum blight**

**Cytospora canker**

**Flatheaded appletree borer**

**Phytophthora collar rot**

# UtahState UNIVERSITY extension



## UTAH PESTS

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.

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- [integrated pest management](#)
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Choose this site for the [plant pest advisories](#), the [IPM Mini-Grant program](#), [weather data](#), and much more.



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### [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:  
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### What's In Bloom

(Salt Lake City area)

Butterfly bush: bloom  
Clethra: end bloom  
Oakleaf hydrangea: end bloom  
Rose-of-Sharon: end bloom

Shrub roses: end bloom  
Sourwood: end bloom  
Sweet Autumn clematis: end bloom  
Trumpet vine: end bloom  
Vitex: end bloom

### Insect/Disease Information

#### DECIDUOUS TREES

##### Cankers on Red-Twig Dogwood

Cankers on stems of red-twig dogwood were observed in Salt Lake County, causing a slow dieback of a large clump. The cankers, possibly caused by the fungus *Botryosphaeria*, appear as longitudinal brown to black sunken areas along the stems. When the bark is scraped away, the margins of the canker are evident.

The only way to manage cankers is to prune out the infected tissue about 6 inches below the lower margin. Thinning the plant and fall rejuvenation pruning will improve air circulation and encourage new growth for next spring.



##### Pear Slug



Pear slugs (also known as cherry slug) are the larvae of a sawfly that appear slimy and almost translucent. They feed on the upper surface of foliage of cherry, mountain-ash, apricot, hawthorn, cotoneaster, plum, and pear. The second generation of larvae are active now, and if they are in high numbers, can cause defoliation. But because this second generation damage is so late in the season, control is not always necessary. If necessary, Bt and spinosad are very effective.

##### Slime Flux

Slime flux is readily apparent on trees now, such as willow, elm, ash, cottonwood and locust. This condition occurs when a large population of naturally-occurring bacteria builds within a tree, causing gases to form. The resulting pressure creates a



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