Diagnosing plant problems

Neil Bell
OSU Extension
Marion and Polk Counties

First, identify the plant

Flowering pear (*Pyrus* sp.)

1. Determine that a "real" problem exists

- What are the characteristics of the plant?
- How does it display them through the year?

Japanese Cedar *(Cryptomeria japonica*) with Incense Cedar (C*alocedrus decurrens*)

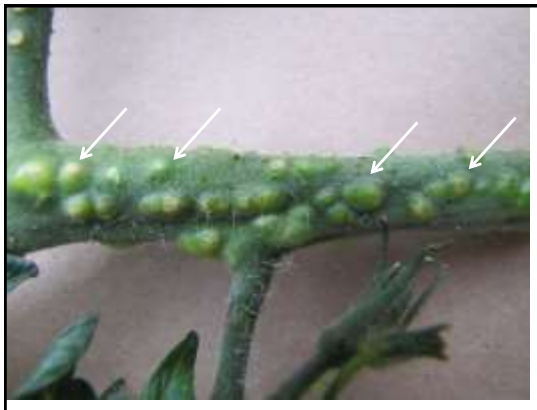
Spruce (*Picea* sp.) and Russian Cypress (*Microbiota decussata*)

Western redcedar (*Thuja occidentalis*): foliar browning

Dwarf Oregon Grape *(Mahonia aquifolium* 'Compacta')

Rhododendron sp.

Crape myrtle
Lagerstroemia sp.



Tomato (*Lycopersicon esculentum*)

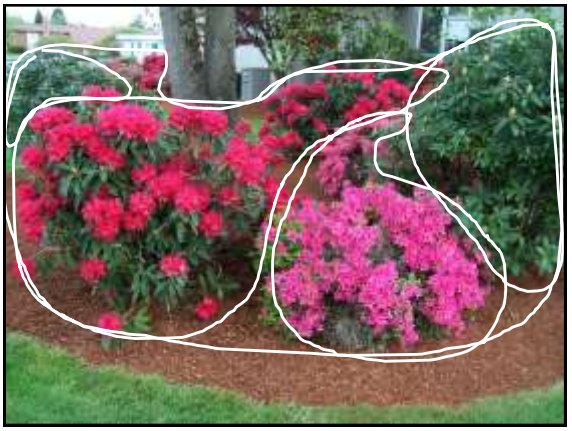
2. What is the "population" of the plants?

Arborvitae (*Thuja occidentalis*)

The "population" refers to the *number of plants of the species of interest* that are present

Dwarf Alberta Spruce (*Picea glauca* 'Conica')

Boxwood (*Buxus sempervirens*), with Hebe (*Hebe* sp.)



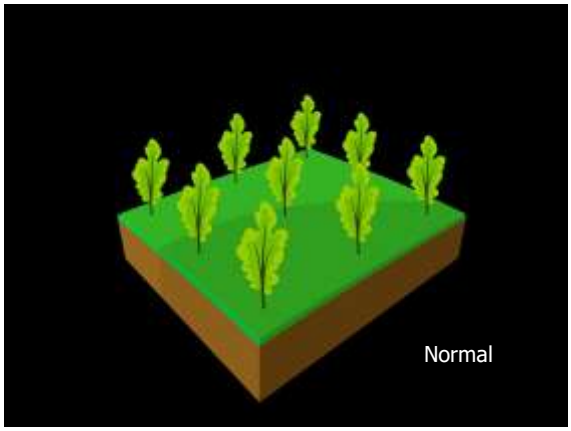
Azalea cultivars (*Rhododendron* spp.): Powdery mildew (*Erysiphe azaleae*)

3. And…how many of the plants are affected?

Kinnikinnick (*Arctostaphylos uva-ursi)*

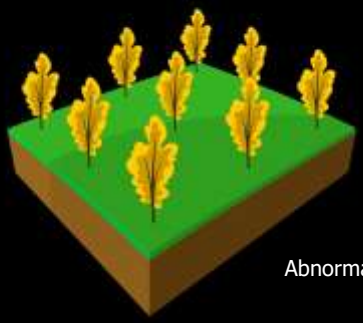
Turfgrass: undetermined problem

4. What is the pattern of damage within the population?



Uniform pattern=abiotic factors (non-living)

1. Entire population uniformly affected



Uniform pattern

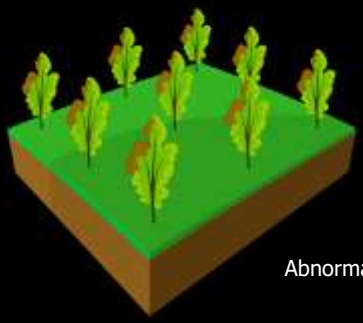
Usually the result of non-living, environmental causes

- Occurs over the entire population of plants, or discrete groups

Periwinkle (*Vinca minor*)

Uniform pattern=abiotic factors (non-living)

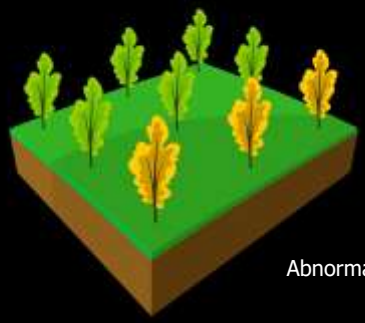
2. Same part of entire population affected



Arborvitae (*Thuja occidentalis*)

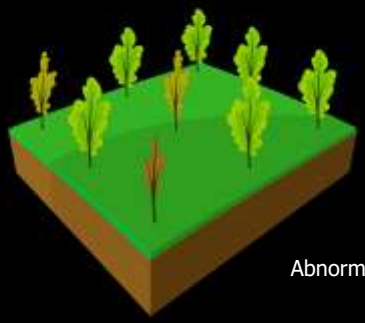
Foliar browning on *Pinus*, *Rhododendron* and *Euonymus*

Uniform pattern=abiotic factors (non-living)



Abnormal

Random pattern=biotic factors (diseases/pests)



Abnormal

Random pattern

- Occurs because of progressive spread of a living organism

Kinnikinnick (*Arctostaphylos uva-ursi*): Black Root rot?

Turf: Cranefly (*Tipula* sp.) damage

Arborvitae (*Thuja occidentalis*): spider mites

Don't overanalyze "uniform" versus "random"

Japanese Cedar (*Cryptomeria japonica*)

Kinnikinnick (*Arctostaphylos uva-ursi*)

Buxus sp.

5. What part or parts of the plant are affected?

Flowering Dogwood (*Cornus florida*)

Just leaves?

Manzanita (*Arctostaphylos* x *media*): Leaf gall aphid (*Tamalia cowenii*)

Red Maple (*Acer rubrum*): Anthracnose (*Kabatiella* sp.)

Leaves and fruit?

Apple (*Malus* sp):
Scab (*Venturia inaequalis*)

Blueberry (*Vaccinium corymbosum*):
Mummyberry (*Monilinia vaccinii-corymbosi*)

Blueberry (*Vaccinium* sp.): Mummyberry (*Monilinia* sp.)

Stem-tip dieback?

Atlas Blue Cedar (*Cedrus atlantica*): Needle Blight (*Sirococcus conigenus*)

Individual stems dying back entirely?

Japanese Maple (*Acer palmatum*): Verticillium wilt (*Verticillium dahliae*)

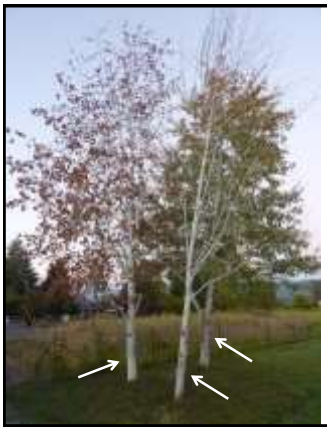
Twig or branch dieback?

Cherry (*Prunus* sp.)

The whole plant?

English Walnut (*Juglans regia*)

Red Maple (*Acer rubrum*): Phytophthora Canker (*Phytophthora* sp.)



Birch: *Betula utilis*

6. What is the pattern of damage within the plant…

Normal

Uniform pattern=abiotic factors (non-living)

Abnormal

Uniform pattern=abiotic factors (non-living)

Abnormal

Dwarf Alberta Spruce
(*Picea glauca* 'Conica'): sunburn

Rhododendron (*Rhododendron* sp.): Nitrogen deficiency

Cyclamen (*Cyclamen* sp.): leaf-edge chlorosis

Random pattern=biotic factors (diseases/pests)

Abnormal

Dwarf Alberta Spruce
(*Picea glauca* 'Conica')

Weeping Cherry: (*Prunus* sp.)

Hawthorn (*Crataegus laevigata*):
Leaf spot (*Diplocarpon mespili*)

Juniper
(*Juniperus* sp.)

Boxwood:
(*Buxus* sp.)

Hebe: (*Hebe* sp.)

Yew (*Taxus* sp.)

7. What is the pattern on the plant part?

Normal

Uniform pattern=abiotic factors (non-living)

Abnormal

Hosta: drought stress

Tomato (*Solanum lycopersicum)*: blossom-end rot

Random pattern=biotic factors (diseases/pests)

Abnormal

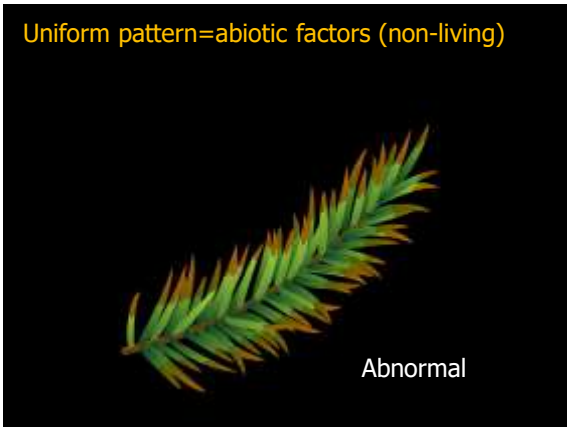
Rhododendron (*Rhododendron* sp.): Powdery mildew *(Eriysiphe azaleae)*

Beets (*Beta vulgaris*):
Leafminer (*Pegomya* sp.)

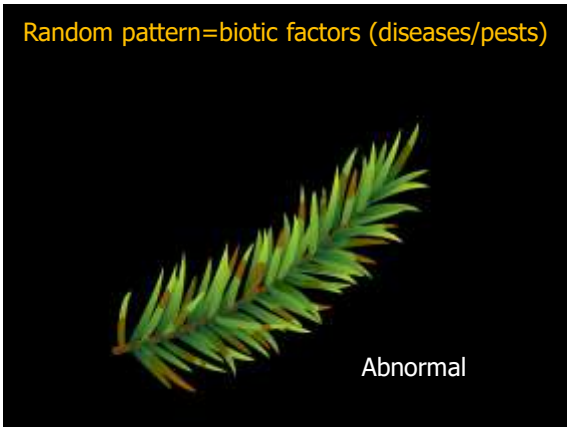
Maple (*Acer* sp.): Bladdergall mite
(*Vasates quadripedes*)

Pear (*Pyrus communis*):
Scab (*Venturia pirina*)

Weeping baldcypress (*Taxodium distichum* 'Cascade Falls')



Grand Fir (*Abies grandis*), Phenoxy herbicide damage



Douglasfir (*Pseudotsuga menziesii*): Needle cast (*Rhabdocline* spp.)

Pacific Dogwood: *(Cornus nuttalii*)

Aspen (*Populus tremuloides*)

Apple (*Malus domestica*)

Apple (*Malus domestica*)

8. When did the symptoms appear?

Alstroemeria (*Alstroemeria* sp.): Frost damage Photo: Luanne Whitaker

Symptoms appear early in the year?

Rosemary (*Rosmarinus officinalis*): cold injury

Cherry Laurel (*Prunus laurocerasus*)-Shothole (*Thyrostroma carpophilum*)

Symptoms appear later in the year

Viburnum tinus-sunburn

Lilac (*Syringa vulgaris*):
Powdery Mildew (*Erysiphe syringae*)

Symptoms appear after specific event

Arborvitae (*Thuja occidentalis*): spray damage by horticultural oil

9. Are the symptoms spreading, improving or constant?

2007 2009

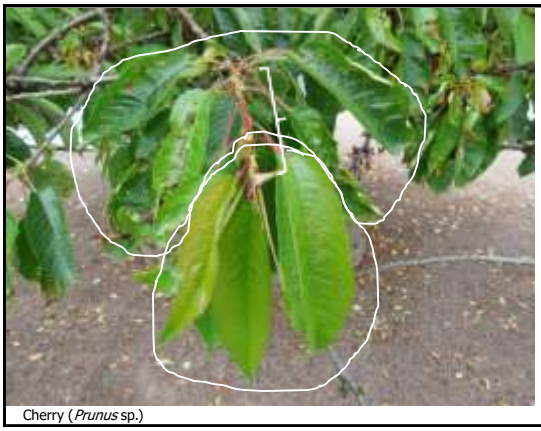
Port Orford Cedar (*Chamaecyparis lawsoniana*): Phytophthora root rot (*Phytophthora* spp.)

Aspen (*Populus tremuloides*)
Leaf scorch

Common Lilac
(*Syringa vulgaris*)

Common Lilac (*Syringa vulgaris*)

Common Lilac
(*Syringa vulgaris*)



Cherry (*Prunus* sp.)

Symptoms stay the same

Rhododendron (*Rhododendron* sp.)

10. Are any signs of a pest present?

Damage from non-living factors will induce *symptom* development, but there will be no *signs* of a pest

Rhododendron (*Rhododendron* sp.): Sunburn

Symptoms: Physical characteristics of a problem expressed by the plant.

Include:
- wilting
- leaf discoloration
- leaf spots
- leaf distortion
- defoliation
- galls
- cankers
- rots/dieback
- "plant decline"

Holly (*Ilex* sp.): leaf discoloration

Western Spicebush (*Calycanthus occidentalis*): leaf spots

Redbud (*Cercis canadensis*): Leaf distortion due to phenoxy herbicide

European Pear (*Pyrus communis*): Fruit distortion due to true bug feeding damage

Fraser Photinia (*Photinia* x *fraseri*): defoliation by Leaf Spot (*Diplocarpon mespili*)

Birch (*Betula* sp.): gall

Forsythia (*Forsythia* sp.): Stem Gall (*Pseudomonas savastanoi*)

Oak (*Quercus* sp.): mite galls

Alder (*Alnus rubra*): cankers (undetermined cause)

Peach (*Prunus persica*): dieback and canker

Tomato (*Lycopersicon esculentum*): rot caused by Late Blight (*Lycopersicon esculentum*)

Kousa dogwood (*Cornus kousa*)
Plant decline

Signs: evidence of the actual causal agent

Diseases:

- fungal fruiting bodies
- fungal mycelia
- bacterial slime (more later…)

Insects:

- the insect itself
- boring holes or tunnels
- sawdust
- frass…

Other…

- rodent mounds/holes
- slug trails

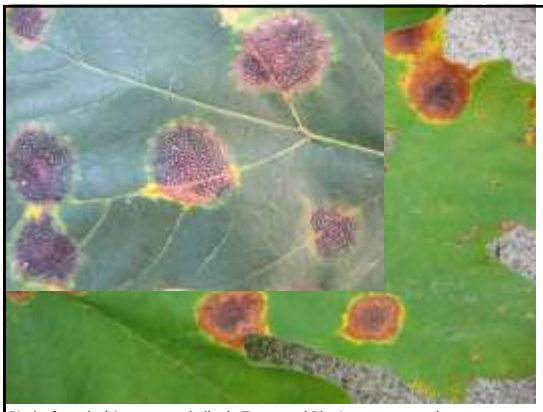
Goldenchain tree (*Laburnum* x *watereri*): aphids

Apple (*Malus domestica*): Crane fly (*Tipula* sp.)

Sunflower (*Helianthus annuus*): Sclerotinia wilt (*Sclerotinia sclerotiorum*)

Apple (*Malus domestica*): Rust (*Gymnosporangium* sp.)

Incense-cedar (*Calocedrus decurrens*):
Broom rust (*Gymnosporangium libocedri*)



Big-leaf maple (*Acer macrophyllum*): Tar spots (*Rhytisma punctatum*)

Cherry (*Prunus* sp.): possible Bacterial canker damage (*Pseudomonas syringae*)

Apple (*Malus domestica*): Leaf roller (species undetermined)

Rhododendron (*Rhododendron* sp.): Azalea Lace Bug (*Stephanitis pyrioides*)

Hebe (*Hebe* sp.):
Meadow spittle bugs
(*Philaenus spumarius*)

Viburnum davidii: leaf notching due to root weevils

Colorado Blue Spruce (*Picea pungens*): White Pine weevil (*Pissodes strobi*)

Colorado Blue Spruce (*Picea pungens*): White Pine weevil (*Pissodes strobi*)

Colorado Blue Spruce (*Picea pungens*): White Pine weevil (*Pissodes strobi*)

Apple: (*Malus domestica*): frass of the Apple-and-thorn skeletonizer (*Choreutis pariana*)

Hosta: slug trails

Vole burrows

Some signs cannot be seen without magnification

Red raspberry (*Rubus idaeus*): RBDV

'Brooks' Plum (*Prunus domestica*): possible Bacterial canker (*Pseudomonas syringae*)

Pear (*Pyrus communis*): Leaf spot-undetermined cause

Websites for home garden problems

Pesticide recommendations for homeowners

- Plant Disease Control:
  - PNW Disease Management Handbook
    http://pnwhandbooks.org/plantdisease/
- Insect Pest Control:
  - PNW Insect Management Handbook
    https://pnwhandbooks.org/insect
- Weed Control:
  - PNW Weed Management Handbook
    http://pnwhandbooks.org/weed/