TREE DISEASES IN GARDENS & PARKS

Duncan Morrison
Forest Pathologist

Plant Pathology

The scientific study of diseases in plants caused by pathogens (biotic) and environmental conditions (abiotic).

(Agrios, G.N. 1972)

DEFINITIONS

- **Disease**: morbid condition of a plant or part thereof
- **Pathogen**: cause of disease
- **Parasite**: organism living on or in another and deriving nutriment directly from it
- **Saprophyte**: organism living on dead organic matter

Disease Detection

- **Symptoms** of disease on the tree

- **Signs** of a pathogen or environmental condition

Symptoms

Crown

Crown

Symptoms

Stem

Stem

Symptoms & Signs

Foliage

Foliage

Signs

Rhizomorphs

Mushrooms

Signs

Conk

Chicken & Angus

Abiotic Diseases
(environmental)

- Drought
- Frost
- Sunscald
- Anoxia

Abiotic

Drought

Prolonged summer drought can cause death of young trees especially those of species, such as western redcedar, that are not adapted to dry sites.

Frost

Abiotic

Sunscald

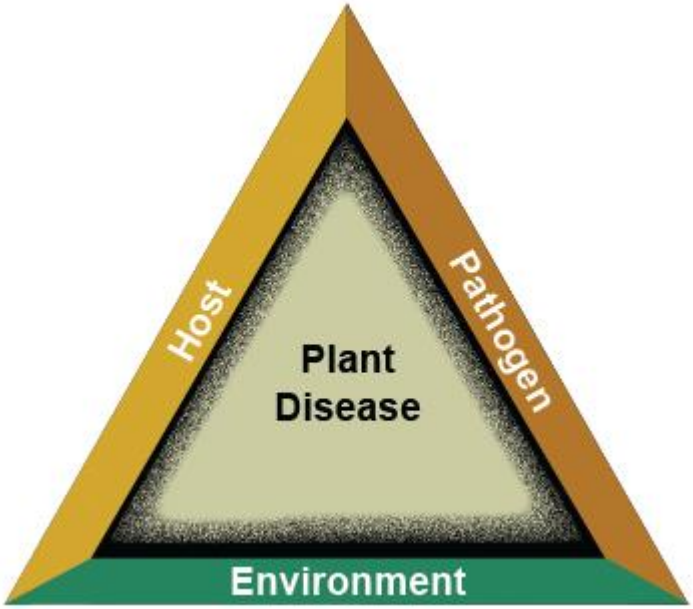
Anoxia

Biotic Diseases

(caused by pathogens, usually fungi)

Our gardens and parks are or were forested.

The organisms causing biotic tree diseases are normal components of forest ecosystems.



Foliage Diseases

- Rhabdocline on Douglas-fir
- Tar spot on bigleaf maple
- Dogwood anthracnose

Foliage disease: rhabdocline on Douglas-fir

Rhabdocline pseudotsugae

Foliage disease: tar spot on bigleaf maple

Rhytisma punctatum

Foliage disease: anthracnose on dogwood

Discula destructiva

Stem Diseases

- wound heart rot
- true heart rot
- dwarf mistletoe on hemlock
- white pine blister rust
- arbutus canker

Stem disease: wound heart rot

Stem disease: wound heart rot

Laetiporus spp.

Stem disease: true heart rot

Phellinus pini

Stem disease: hemlock dwarf mistletoe

Arceuthobium tsugense

Stem disease: white pine blister rust

Cronartium ribicola

Stem disease: Arbutus canker

Fusicoccum arbuti

Root Diseases

- laminated on Douglas-fir
- schweinitzii on Douglas-fir
- armillaria on conifers
- armillaria on Garry oak

Root disease: laminated on Douglas-fir

Phellinus sulphurascens

Root disease: Schweinitzii on Douglas-fir

Phaeolus schweinitzii

Root disease: armillaria on conifers

Armillaria ostoyae

Root disease: armillaria on Garry oak

Armillaria gallica

When diseased trees become hazardous…

Hazard tree recognition

Annual assessment, at least, of tree condition

Signs & symptoms indicate defects in roots, stem or branches

Would a failure result in property damage, personal injury or death?

Hazard tree management

Rating the hazard

1. **Failure potential (1-3)**: given evidence of disease, how likely is failure?

2. **Failure impact (1-3):** probability of hitting a target?

3. **Hazard rating =** value for **1 +** value for **2**

Hazard abatement in parks

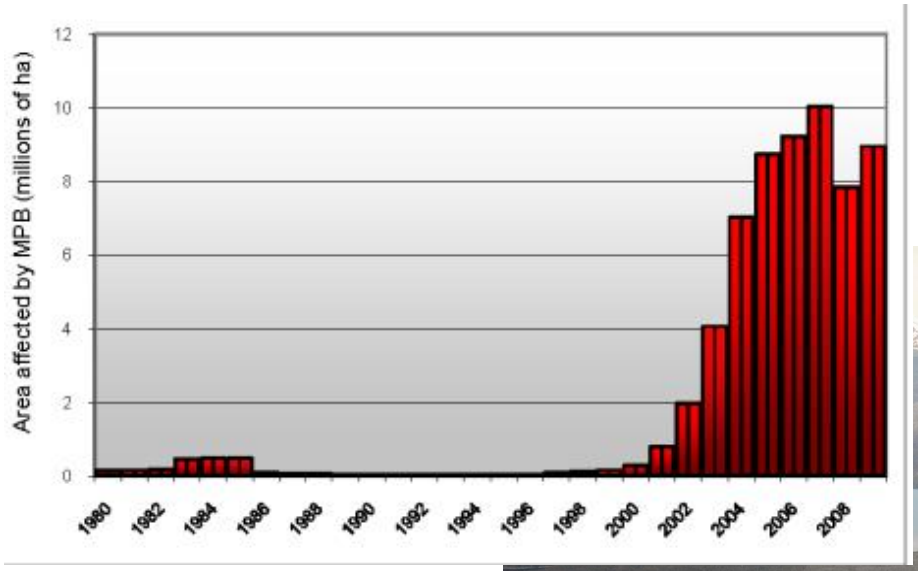
- Inspect all trees within a tree length of a trail, tent pad, picnic table and building.
- Tag defective trees, describe the defect and rate the hazard.
- Remove all dead trees from the target area.
- Trees with a hazard rating of 5 or 6 must be considered for hazard abatement.
- Record what was done.

Forest health and climate change

- Mountain pine beetle

- Dothistroma needle blight of lodgepole pine

Mountain pine beetle



Dothistroma needle blight

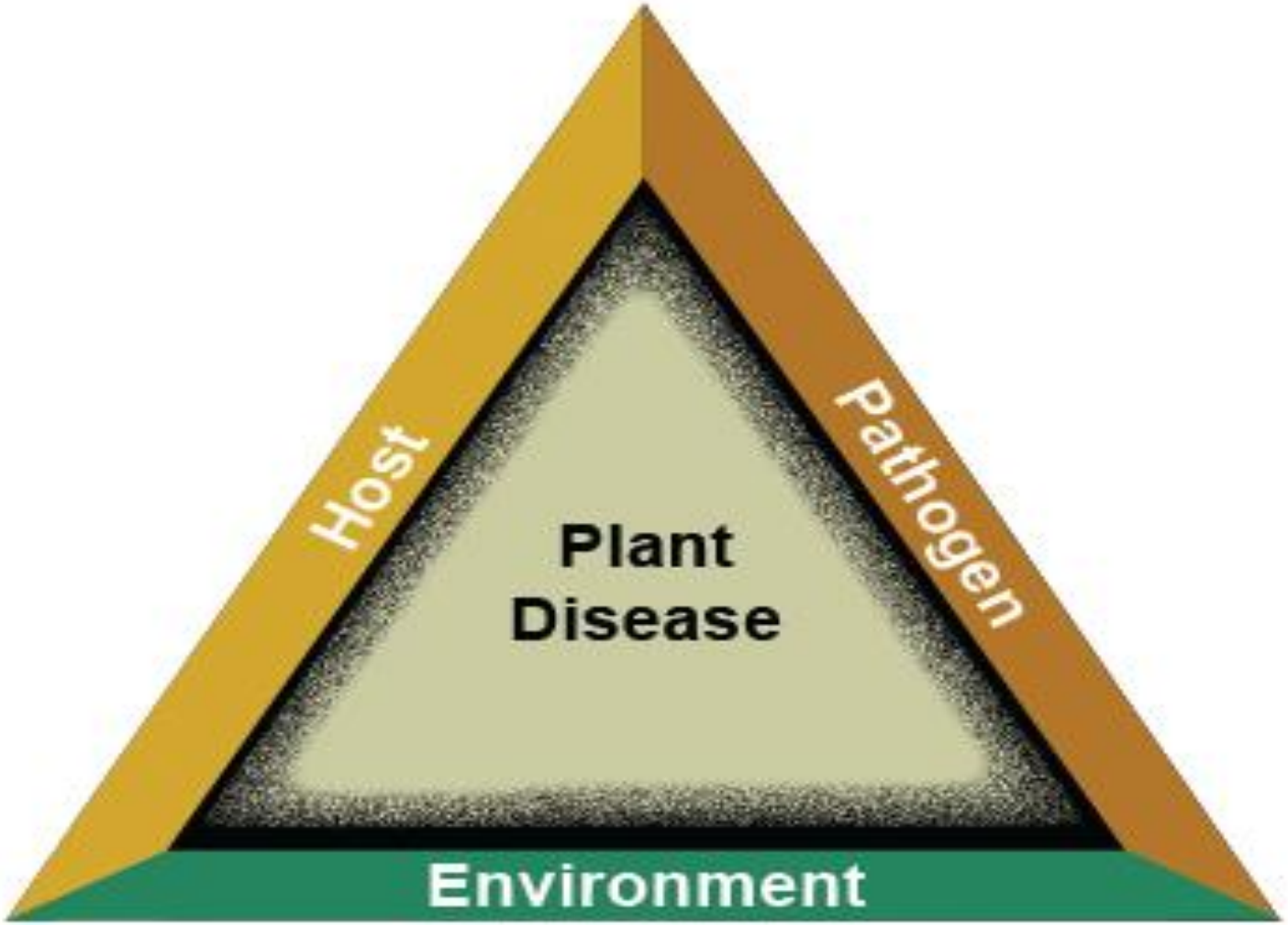
This native foliar disease killing mature and plantation trees suggests major change in the balance between host and environment.

The outbreak is associated with ↑ summer ppt.

Similar pattern of damage elsewhere in NH.

Alex Woods (BC MOF)

Tree disease and Forest management in a changing climate



What might happen?

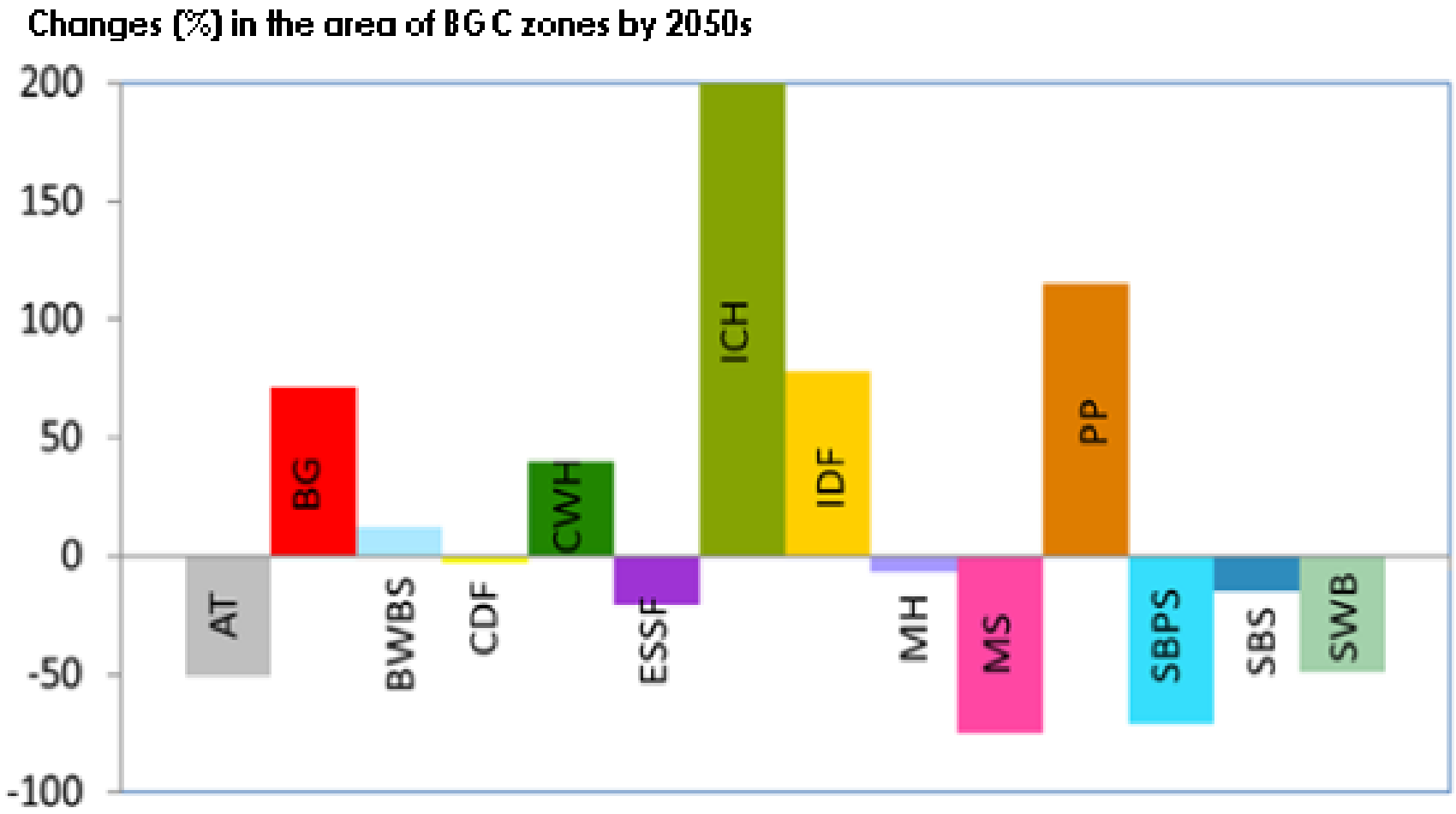
- BC MOF forest health specialists suggest:

Foliar: **if** temp & ppt increase, then > disease.

Root: **if** drought, then > host stress and disease.

Stem: **if** temp & ppt increase, then > infection and spread.

Beware the status quo: implement changes that address a broad range of future conditions.



Hamann, A. and Wang, T. Climate BC and bioclimatic envelope modelling. cfcg.forestry.ubc.ca

WHAT TO DO?

WIFDWC climate change committee suggests:

- Diversity of species: use those currently suitable and those that might be suitable in the future climate
- Diverse stand structures
- Assisted migration
- Adaptive management approach
- Intensive monitoring

Acknowledgements

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