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Development
SERVICES DEPARTMENT
Building a Better and Safer Austin Together

Tree Care and Diagnosis

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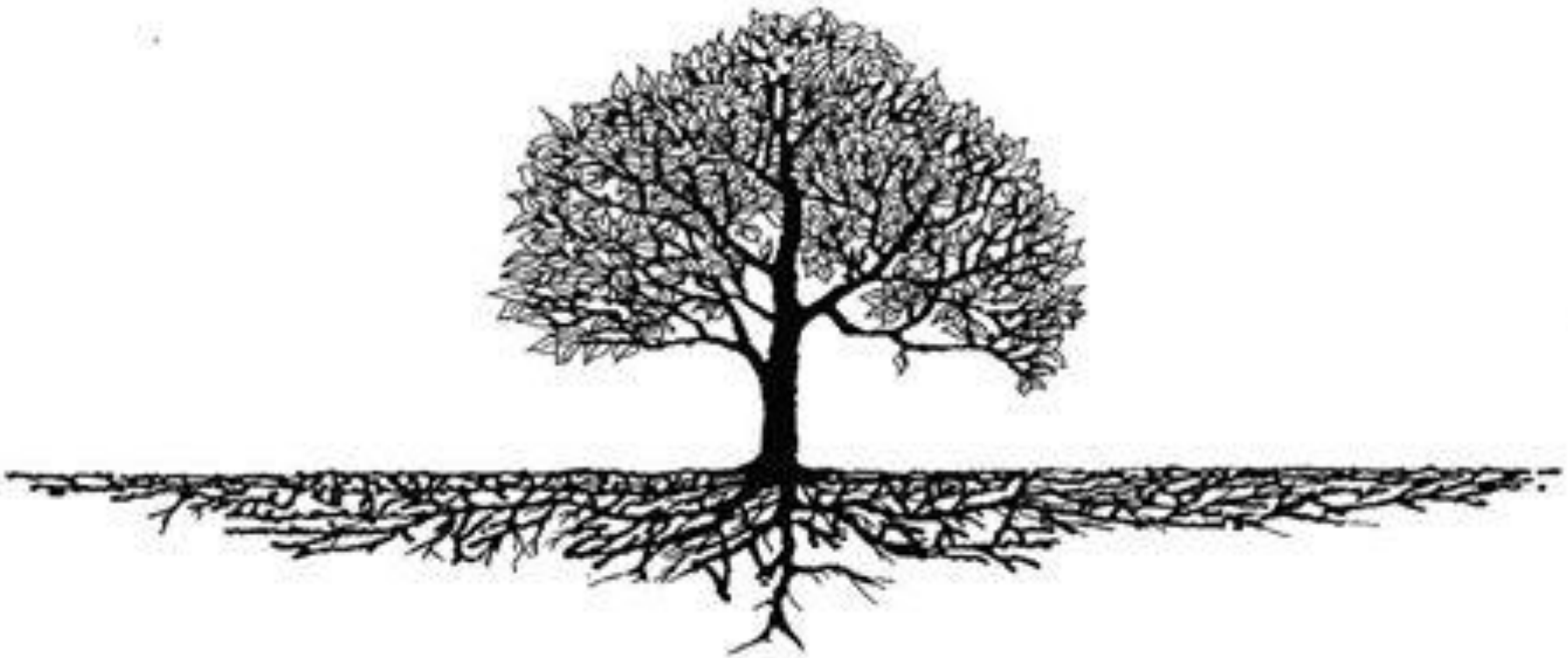
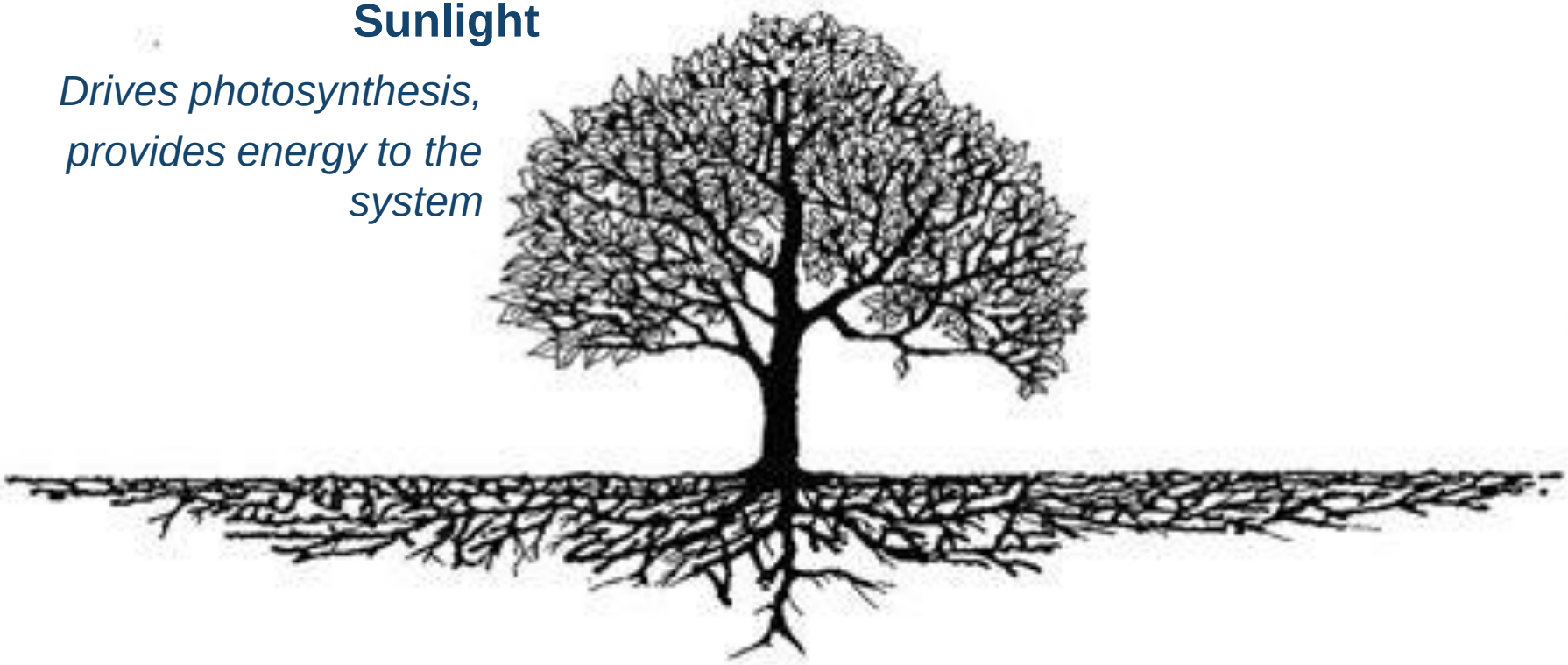
11/17/2020

What Do Trees Need?

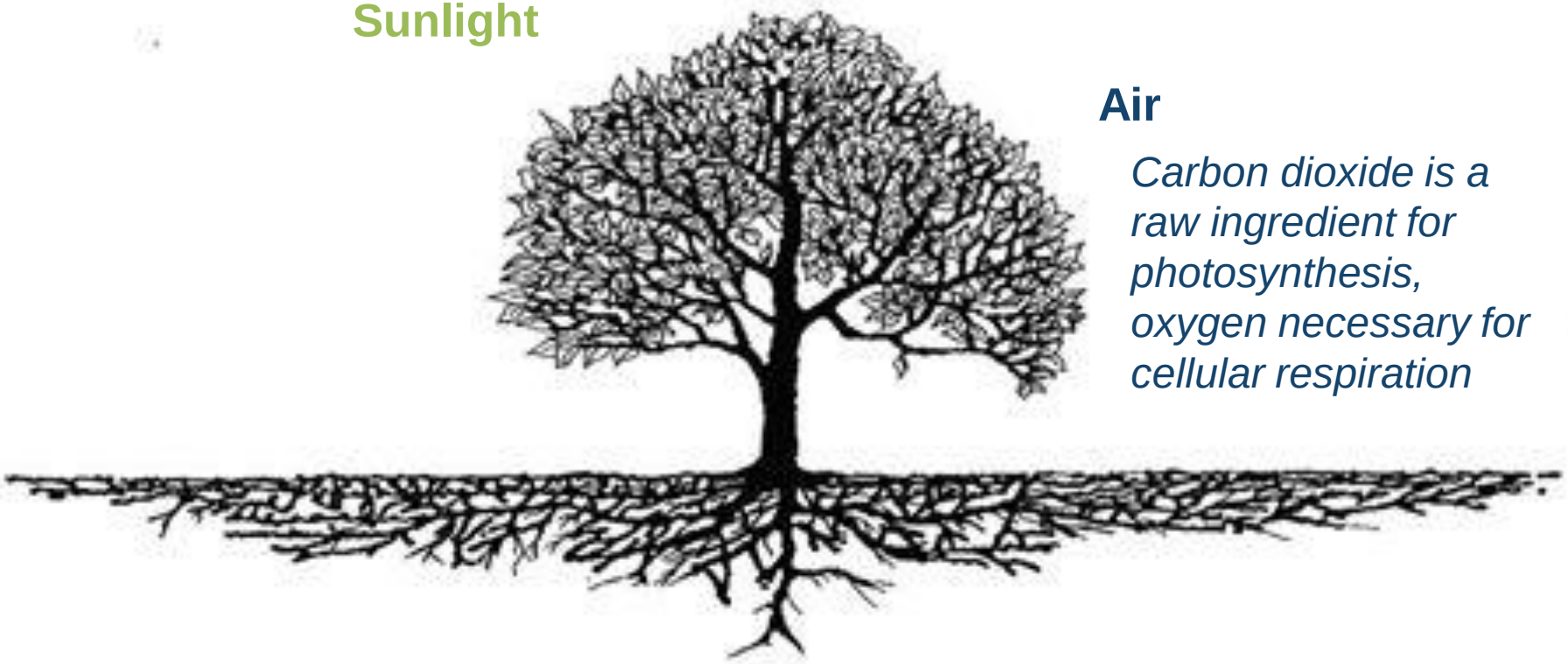


Sunlight

Drives photosynthesis, provides energy to the system



Sunlight



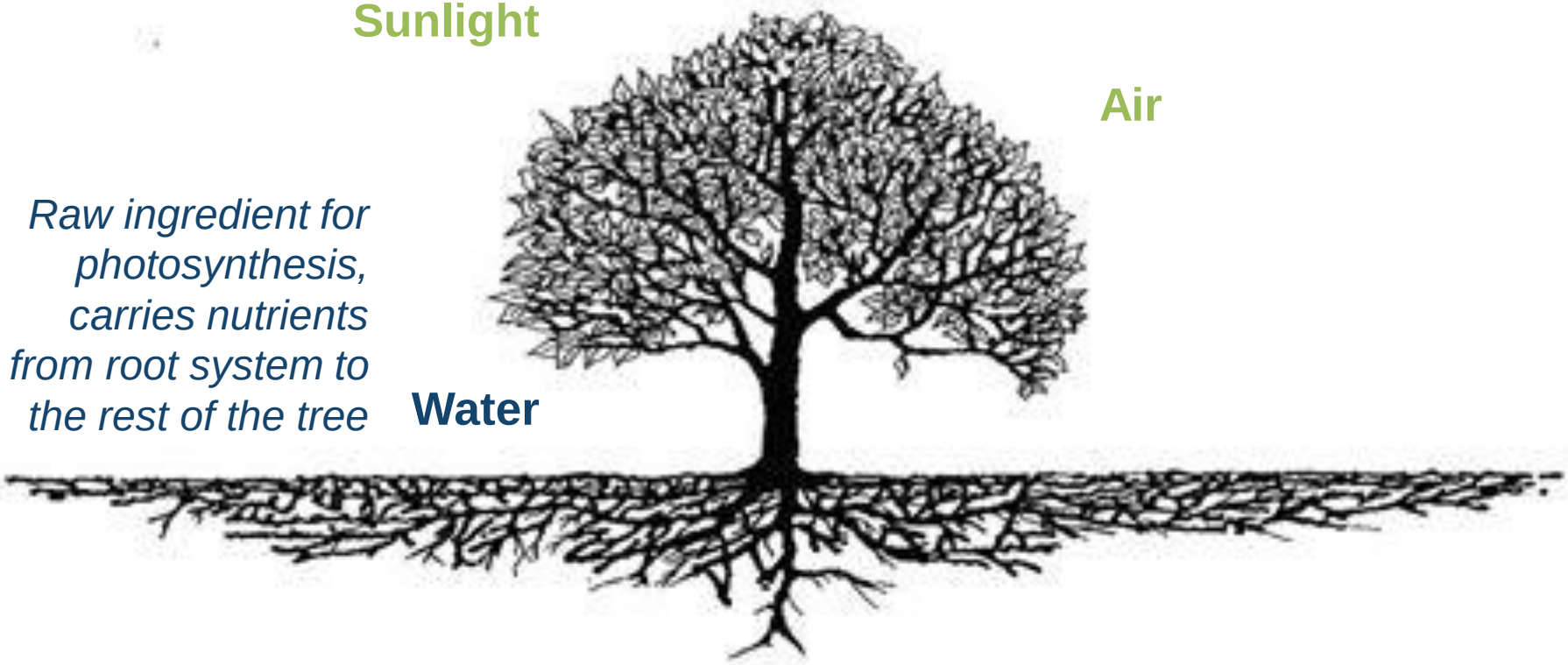
Air

Carbon dioxide is a raw ingredient for photosynthesis, oxygen necessary for cellular respiration

Sunlight

Air

Raw ingredient for photosynthesis, carries nutrients from root system to the rest of the tree



Water

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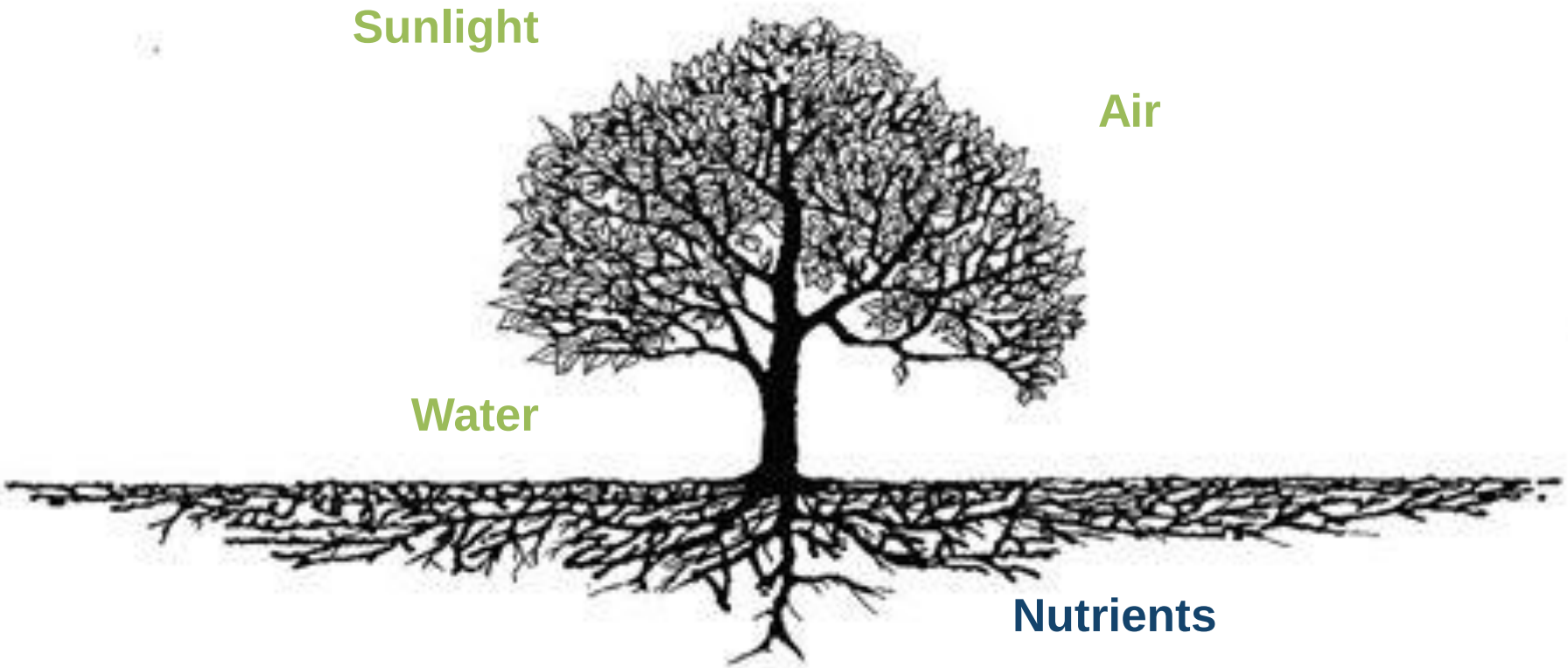
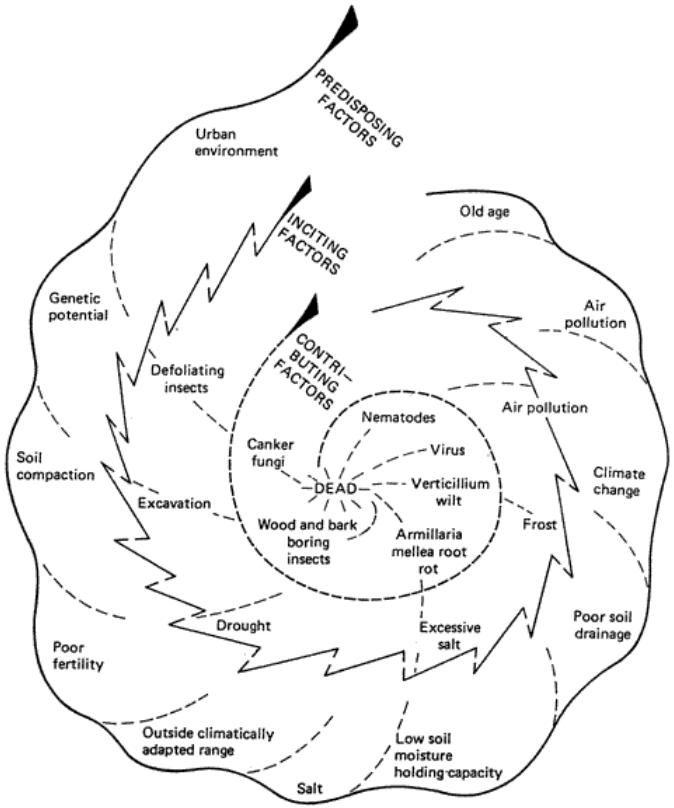
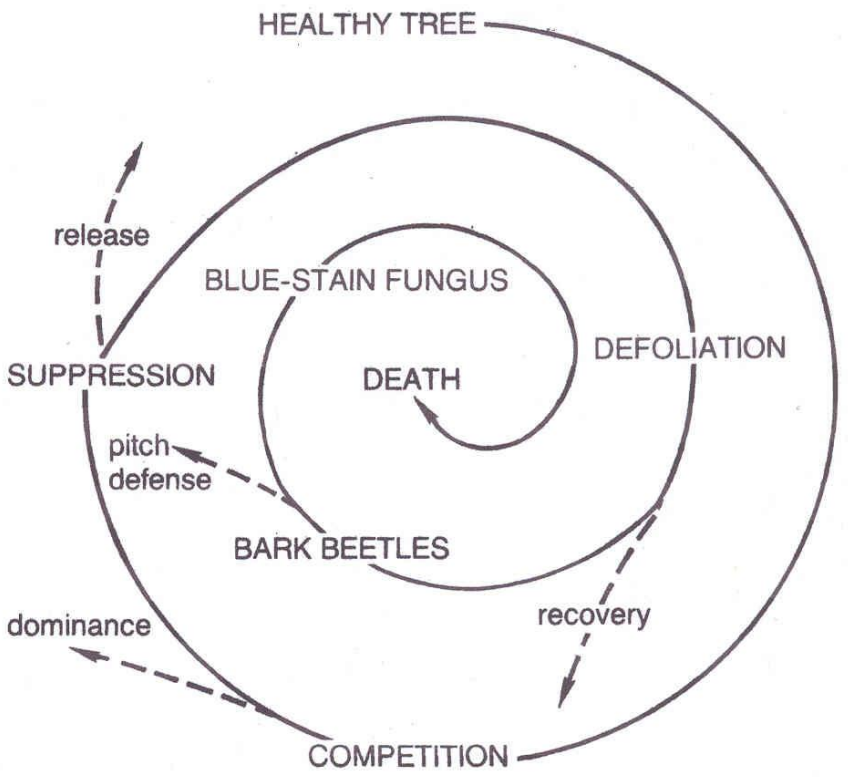


Necessary in varying amounts for growth, regulation, defense, and reproduction

If a tree cannot access these components the tree will decline and eventually die.

How Do Trees Die?



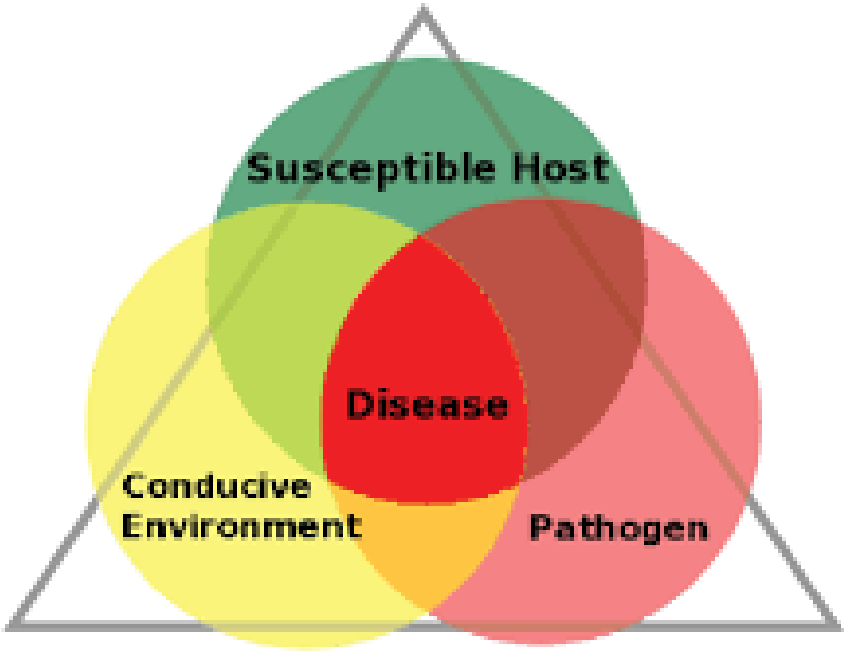


Paul Manion's spiral of tree decline

Abiotic vs Biotic

- *Environmental*
- *Often human-caused*
- *Often chronic, unreported, and undiagnosed*
- *Responsible for most urban tree decline*

- *Pathogens, insects, mammals, birds*
- *Easier to diagnose*
- *More frequently reported*
- *Often secondary or opportunistic*



Disease Triangle

Challenges in Diagnosis

What are some limits to our knowledge?

- **Evidence is inaccessible**

(under the soil, within the trunk, high in the canopy)

What are some limits to our knowledge?

- Evidence is inaccessible
- **Visible symptoms are not specific**

(Relatively few ways for a tree to signal trouble)

What are some limits to our knowledge?

- Evidence is inaccessible
- Visible symptoms are not specific
- **Limited resources for diagnosis**
  (insufficient time or budget)

What are some limits to our knowledge?

- Evidence is inaccessible
- Visible symptoms are not specific
- Limited resources for diagnosis
- **Inadequate context or site history**

(new owners, lack of attention, lack of documentation)

What are some limits to our knowledge?

- Evidence is inaccessible
- Visible symptoms are not specific
- Limited resources for diagnosis
- Inadequate context or site history
- **Lack of scientific research**

What are some limits to our knowledge?

- Evidence is inaccessible
- Visible symptoms are not specific
- Limited resources for diagnosis
- Inadequate context or site history
- Lack of scientific research
- **Our own assumptions and expertise**

"In the beginner's mind there are many possibilities, but in the expert's there are few." –Shunryu Suzuki

“Why is my tree turning yellow?”

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So then…

…how do we diagnose?

1. Know Your Trees

- Correctly identify the species
- Know the typical growth and foliage characteristics for common species in your area
- Familiarize yourself with common problems

2. Ask the Right Questions

- "When did you notice the problem?"
- "How closely do you monitor your trees?"
- "Tell me about any construction activity or other soil disturbance within the last five years."
- Open ended questions provide an opportunity for additional or unexpected information.

3. Inspect the Tree and Site

- Look for soil disturbance, evidence of concrete work or repair, damage or discoloration on other vegetation.
  - Look for patterns of symptoms...

…within individual leaves

…on single branches

…within the canopy of a single tree

…across multiple trees on a site

…and across time, where possible

4. Research

- Seek out photos or documentation of the condition of the tree and site over time. Client may be able to provide these. Google Street View is also a resource.
- Additional research into unfamiliar pests or pathogens may be necessary.

4. Diagnose and Report

- Declining trees are rarely suffering from a single problem
- Understand likely causal relationships among symptoms
- Communicate diagnosis as well as any uncertainty about the diagnosis to the client
- Be ready to recommend for or against treatment
- Understand client's goals and concerns

Oak galls on live oak, top left
Tar spot on live oak, right
Oak wilt-symptomatic leaves on live oak, bottom left

Questions?

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