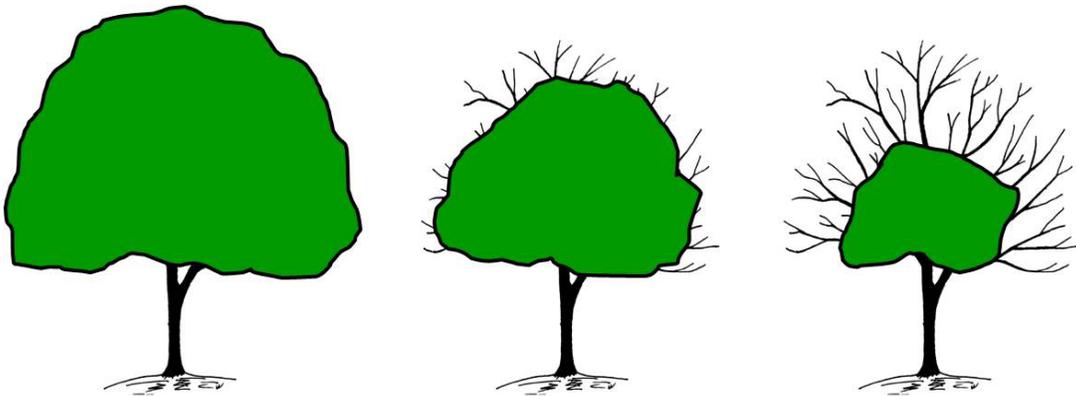




**MASTER GARDENER**  
COLORADO STATE UNIVERSITY  
EXTENSION



# The Diagnostic Process

## References

### **CMG GardenNotes – This unit is covered in two different CMG classes**

#### ***Plant Health Care and the Diagnostic Process*** (basic training)

- #100, References and Review Questions: The Diagnostic Process
- #101, IPM: Plant Health Care
- #102, Diagnosing Tree Disorders
- #104, Worksheet: Step 2 in the Diagnostic Process
- #105, Homework: Plant Health Care and the Diagnostic Process

#### ***Diagnosing Tree Disorders*** (Plus Class)

- #100, References and Review Questions: The Diagnostic Process
- #102, Diagnosing Tree Disorders
- #103, Diagnosing Soil and Root Disorders on Landscape Trees
- #106, Worksheet: Tree Root Spread
- #107, Homework: Diagnosing Abiotic Tree Disorders
- #108, Worksheet: Diagnosing Insects and Diseases of Trees
- #109, Worksheet: Pest Management Options
- #110, Homework: Diagnosing Insects of Trees: Ips and MPB

#### **Books**

- ***Abiotic Disorders of Landscape Plants: A Diagnostic Guide***. University of California Agriculture and Natural Resources Publication 3420. 2004. ISBN: 1-879906-58-9
- ***Aspen: A Guide to Common Problems in Colorado***. Colorado State University Extension Publication 559A. 1996. – \$5.00 (color)
- ***Insects and Diseases of Woody Plants of the Central Rockies***. Colorado State University Cooperative Extension Bulletin 506A. 2014.
- ***Plant Health Care for Woody Ornamentals***. University of Illinois Cooperative Extension. 1997. ISBN: 1-883097-17-7

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PHC and Diagnosing Plant Disorders curriculum developed by David Whiting (CSU Extension, retired) and Carol O'Meara (Colorado State University Extension). Revised by Mary Small, CSU Extension

- Colorado Master Gardener Training is made possible, in part, by a grant from the **Colorado Garden Show, Inc.**
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Revised and updated May 2015

## Class Objectives

CMG volunteers approach diagnostic situations as a process. At the end of class, the student will be able to:

- Describe concepts of *Plant Health Care*, *PHC*, (IPM as it applies to landscape management)
- Outline the life cycle of trees and describe how tree needs changes with stages in the life cycle
- List steps in the diagnostic process
- Using the diagnostic process, diagnose routine insect and disease problems of trees

## Review Questions

### Plant Health Care and the Diagnostic Process

1. Define IPM and PHC.
2. Describe concepts central to PHC.
3. Give examples of common PHC tools used in home gardening.
4. What is the PIC cycle? What does it explain about tree care and pest problems?
5. In diagnosing *contributing* disorders, why is it important to also identify the *predisposing* and *inciting* factors to the extent possible?
6. List the four steps, with substeps in the diagnostic process.
7. Give examples of living factors that cause plant problems. Give examples of non-living (abiotic) factors that cause plant problems.
8. Why is it important to correctly identify the plant?
9. Define *symptom* and *sign*. Give examples of each.
10. Define the following terms:
  - a. Chlorosis
  - b. Blight

- c. Dieback
- d. Decline
- f. Leaf spot
- g. Leaf scorch
- h. Canker
- i. Gall
- j. Fruiting bodies
- k. Mycelium
- l. Slime flux

11. Explain why it is important to define what is normal versus abnormal about a plant problem.
12. List the five growth phases, giving growth objectives for each. What indicates that trees have changed their phase?
13. Why is it important to talk about tree care issues as they relate to growth phases?
14. If the average length of annual growth of twigs changes from 8 inches (4 years ago), 1 inch (3 years), 2 inches (2 years) and 1 inch (1 year), what does it suggest about the tree's vigor? What if the growth changes from 6 inches (4 years) 1 inch (3 years), 2 inches (2 years) and 3 inches (1 year)?

### Diagnosing Tree Disorders class

1. Describe essential skills used in the diagnostic process.
2. Explain how knowing the context of the situation helps in diagnosing the disorder.
3. Explain how painting a mental picture of a plant problem helps in diagnosing a disorder.
4. Explain how repeating back the details in your own words helps in diagnosing a disorder.
5. Explain how to tactfully change directions when the evidence leads down another road.
6. Why is it important to discuss management options only after the problems have been diagnosed?
7. List the four steps, with substeps in the diagnostic process.
8. List steps for systematically evaluating a tree.

9. In the landscape setting, what is the universal limiting factor for root growth?
10. What percentage of landscape plant problems relate to root/soil/water (underground) issues?
11. Describe the typical rooting system of a tree. Describe location and function of the following root types:
  - Root plate or zone of rapid taper
  - Transport roots
  - Feeder roots
  - Sinker roots
  - Tap root
12. What two factors play into the rooting depth and spread?
13. What is the typical depth and spread of tree roots? How does this change for compacted/clayey soils?
14. Explain how to calculate the *Critical Rooting Radius* and *Tree Protection Zone (Protected Root Zone)*.
15. Describe how potential rooting spread impacts tree growth and vigor. What happens when a tree's root system cannot spread as needed?
16. Describe techniques to evaluate soil/root disorders and soil compaction.
17. Describe worthwhile techniques to reduce soil compaction around trees. Explain why questionable techniques to reduce soil compaction are out of favor.
18. What single factor accounts for the most deaths of landscape trees? What causes trunk-girdling roots? How long after planting can trunk-girdling root develop? What can be done for a tree with trunk girdling roots?
19. Describe how a tree balances root growth with canopy growth.
20. In pest management, what are *bionaturals*? What is *preservation* and *importation* of bionaturals? Why don't we import more bionaturals?
21. List the PHC questions for using pesticides.
22. Based on actual records from landscape management, what percentage of pest problems warrant the use of a pesticide?