

# Diagnosis of Plant Problems Hotline Training

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UC Cooperative Extension

U.C. Monterey Bay Master Gardeners Training

February 11, 2012

# UC Cooperative Extension Master Gardeners (MG)

- MGs are certified volunteers of UC. There are certain privileges and responsibilities.
- MG trainees after completing class, final, and signed online agreements are “First Year” UC certified Master Gardeners (June, 2012).
- “First Year” MGs re-certification MBMG requires 50 volunteer hours and online agreements (July 2012 to June 2013).
- For second year, 25 volunteer training hours and 12 continuing education (CE) hours and signed agreements (July 2013- June 2014).

# OUTLINE

- Introduction: What to expect on the Hotline
- Hotline procedures
- Diagnosing plant problems
- References, websites

# READING

Chapter 22, “Diagnosing Plant Problems”  
UC MG Handbook

# Hotline

- Resource for research-backed gardening information and plant problem diagnosis.
- Questions on home, landscape, and garden pests, diseases, and horticulture.
- An important component of UC Cooperative Extension outreach to the public.
- Master gardeners learn a lot and have fun.

# Common questions and requests



- Diagnose a plant problem and recommend control
  - Insects, diseases, vertebrates, and plant disorders
- General plant care
- Plant identification (weeds, fruit and ornamentals)
- Many calls in spring and summer

# Hotline Office Procedures

- MWF 9 AM to Noon.
- Be conscientious and courteous of others working or meeting here.
- What's first
  - Recorded Messages
  - Pending Log Forms
  - Plant samples to examine.
- Complete the log form

# How to answer questions

- Determine what the question or problem is.
- Determine if the MG hotline is the appropriate contact.
- Find the answer or diagnose the problem. Ask probing questions using the Hotline Log. Ask for samples.
- You can say “I don’t know, but we will get back to you with the answer.”

# Hotline MG

A hybrid: librarian and detective



# What questions you should not answer

- (1) Professionals making a living in horticulture or farming.  
landscape architect, arborist, landscape contractor, farmer and associated industries
- (2) Legal
- (3) Medical

In general, if you didn't have a class on the subject, you probably should not be talking about it.

Master Gardener Hotline Log

Date: \_\_\_\_\_

PLEASE FILL OUT COMPLETELY:

Caller's Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ MG taking initial call: \_\_\_\_\_

**1. DESCRIPTION OF PROBLEM OR REQUEST. IF WEED, INSECT OR PLANT DISEASE PROBLEM, ALSO COMPLETE THE OTHER SIDE OF THIS PAGE :**

**2. ANSWER GIVEN TO THE CALLER:** MG name: \_\_\_\_\_ Date: \_\_\_\_\_  
(If multiple entries are made here, then indicate MG name and date for each entry)

**3. WRITTEN MATERIALS SENT TO CALLER:** MG name: \_\_\_\_\_ Date: \_\_\_\_\_

**4. If response is not complete, describe what needs to be done next and file in **pending** book. If specimen sent to farm advisor, enter information on log sheet in front of **pending** book. If client does not respond to two call backs, then close item due to lack of response. (If multiple entries are made here, then indicate MG name and date for each entry)**

DATE (#2, #3, #4) COMPLETED : \_\_\_\_\_ (FILE IN **COMPLETED** BOOK)

# Hotline Log Form

# Hotline Log Form

## Section 1. (Continued):

**IF WEED, INSECT OR PLANT DISEASE PROBLEM, THE FOLLOWING INFORMATION IS REQUIRED: (circle appropriate word or fill in blank)**

Nature of problem: weed / insect / disease/other or unknown

Identify plant: \_\_\_\_\_  
(Common name required; genus, species & variety if known)

Age of plant: seedling / recently transplanted / established

Plant part(s) affected: entire plant / young leaves / old leaves / roots

Container or Soil grown? Heavy soil or light soil?

Describe important characteristics of the location of the plant \_\_\_\_\_

How many plants are affected? \_\_\_\_\_

Symptoms or signs: \_\_\_\_\_

## OTHER USEFUL INFORMATION, AS AVAILABLE:

Environmental extremes: heat / cold too much / too little water

Other: \_\_\_\_\_

Manmade problems:

Pesticides used: name \_\_\_\_\_

Were label instructions for rate and frequency followed? \_\_\_\_\_

Irrigation frequency: \_\_\_\_\_

Other: \_\_\_\_\_

## SPECIMEN:

Ask for a specimen if the **required** information above is not known or is insufficiently described to complete the inquiry. The specimen should be indicative of the range of symptoms and include signs of pest or pathogen, if available. Plant/Pest/Weed specimen should be placed in a sealed plastic bag or other sealed container. Place sealed specimen on the front counter of the office with this form attached **and enter info on specimen log sheet in front of pending book.**

Completed by **FARM ADVISOR** initials: \_\_\_\_\_ DATE: \_\_\_\_\_

Diagnosis/Identification, Recommendation/Special Instructions:

MASTER GARDENER: Contact customer and provide response as above. Complete sections 2 and 3 on front side of form.

# Hotline

- Service oriented
  - timely
  - courteous
  - accurate information and diagnosis



# Diagnosis of plant problems

## Types of communication

- Telephone
  - Good
  - but a real challenge because visualization of problem can be difficult
- Plant samples and information forms left for you.
  - Better
- In person, “over the counter”
  - Best
  - fresh samples, good communication

# The Challenge: Identify the Cause

**Diagnosis:** The process of identifying the cause or causes of a problem

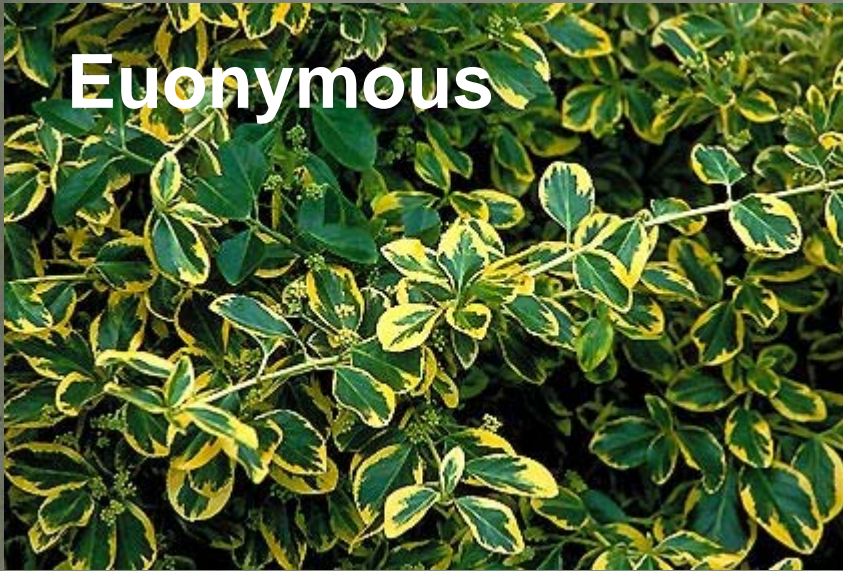




# Diagnosis of plant problems

## First steps

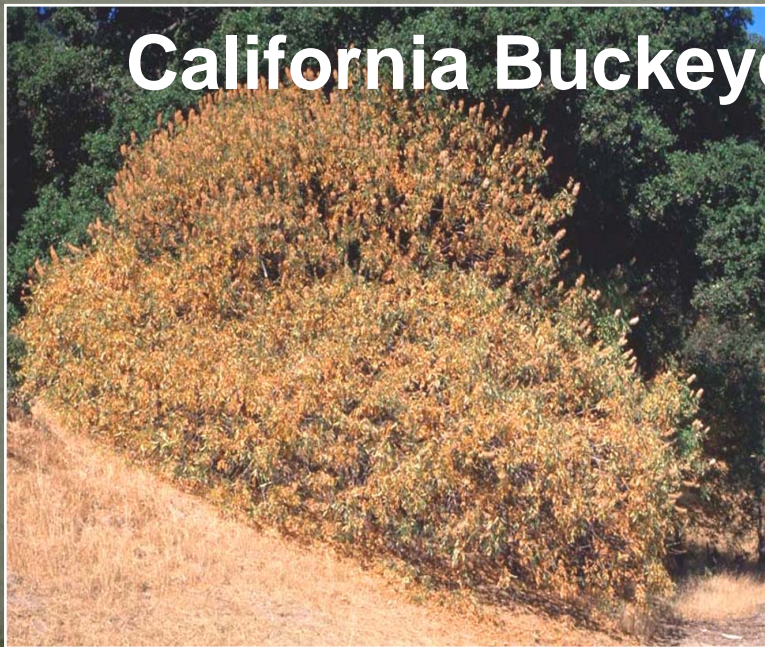
- What is the problem according to the client?
  - What do they want?
  - Can you help them?
- Is there really a plant problem?
  - Is the “problem” normal ?
  - Know what a healthy plant looks like.



**Euonymus**



**Euphorbia**



**California Buckeye**



**Liquidambar**

# Plant Problems

- **Disease**
  - Pathogens
    - Fungi, bacteria, viruses, nematodes
- **Disease disorders**
  - Not caused by a living organism
    - Deficiencies and excessive environmental factors: weather, nutrients, salts, soil aeration, pesticides
- **Insects**
- **Weeds**
- **Vertebrate Pests**

# Diagnosis of plant problems

## Information gathering

- Identify plant
- Characterize the problem
  - Identify and describe symptoms and signs
- Collect information about the problem
  - Look for patterns
  - Culture, pesticides, weather
  - Plant, soil, and water samples

Hotline log formatted to help you obtain this information

# “Gray mold” caused by *Botrytis*



**Symptoms**



**A Sign**

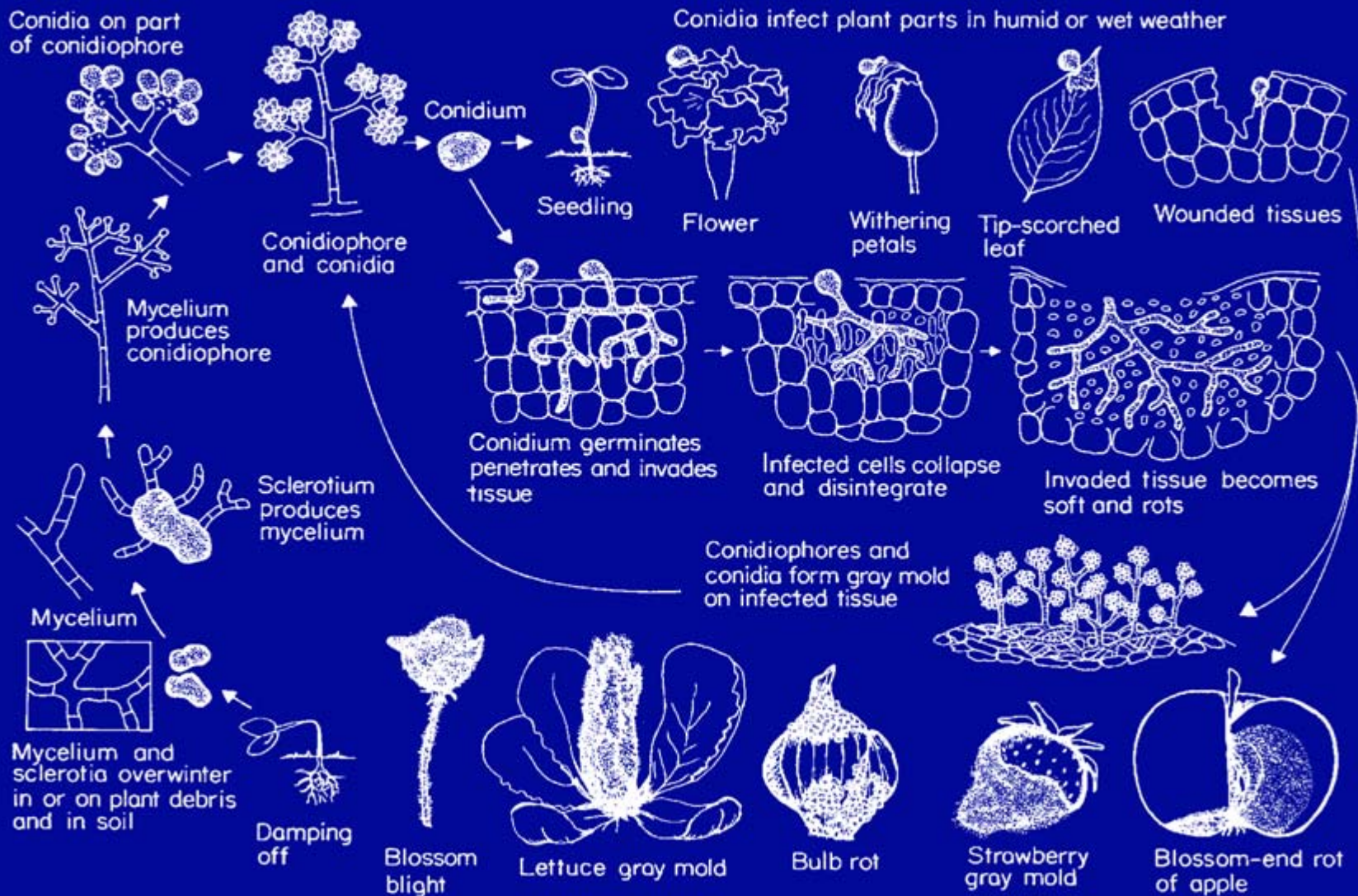
*A symptom is the physical manifestation of a disease*

*A symptom can be progressive*

*A “sign” is the visible presence of the pathogen*



# Development of *Botrytis* Gray Mold Diseases





**Symptoms**



**Signs**

**Greenhouse  
thrips**



# Diagnosis of plant problems

Information gathering

Symptoms

# Diagnosis of plant problems

## Information gathering

### Symptoms

- **What?** Characterize as galls, wilt, yellowing, leaf spots, distorted leaves, chewed leaves, stippled leaves, sooty mold, honeydew

# Diagnosis of plant problems

## Information gathering

### Symptoms

- What? Characterize as galls, wilt, yellowing, leaf spots, distorted leaves, chewed leaves, stippled leaves, sooty mold, honeydew
- **Where?** Parts of the plant, patterns

# Diagnosis of plant problems

## Information gathering

### Symptoms

- What? Characterize as galls, wilt, yellowing, leaf spots, distorted leaves, chewed leaves, stippled leaves, sooty mold, honeydew
- Where? Parts of the plant, patterns
- **When?** When and under what environmental conditions

# Diagnosis of plant problems

## Information gathering

### Symptoms

- What? Characterize as galls, wilt, yellowing, leaf spots, distorted leaves, chewed leaves, stippled leaves, sooty mold, honeydew
- Where? Parts of the plant, patterns
- When? When and under what environmental conditions

Again: Hotline log formatted to help you obtain this information

# Diagnosis of plant problems

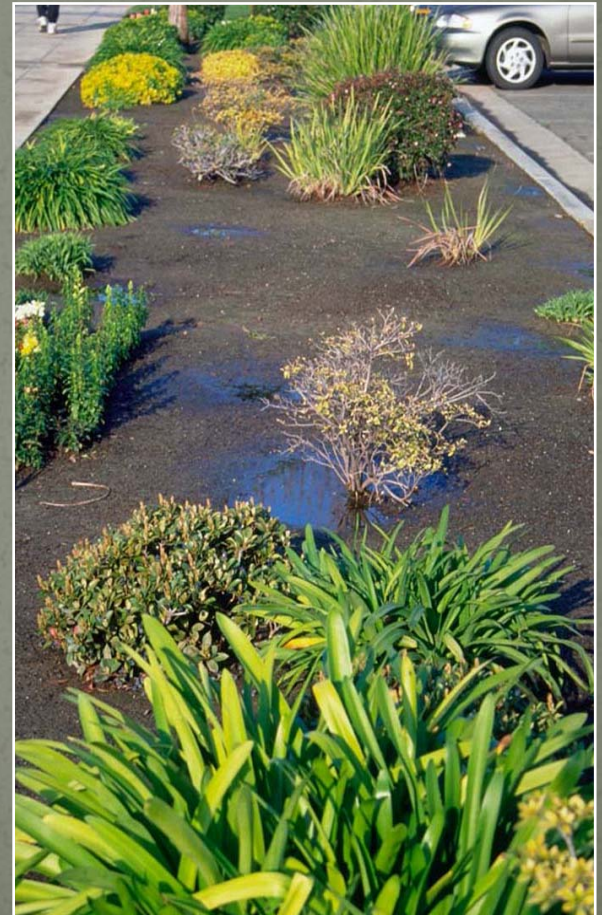
## Examination

- naked eye
- hand lens, dissecting scope
- light microscope, electron microscope laboratory culture of pathogens

# Diagnosis of plant problems

## Information gathering

- Other factors
  - water, fertilizer, pesticides
  - plant age
  - container versus field soil



# Diagnosis of plant problems

## What is a good plant sample?

- The plant (sample) is identified
- Usually living insects left on plant with associated damage. Insects can be removed and placed in a vial containing 70% rubbing alcohol too.
- Sample is fresh, dry, packaged in closed plastic bag, and labeled.
- Pertinent cultural and environmental information
- Associated pictures or videos.

**A Good Sample !**





## Samples for disease diagnosis

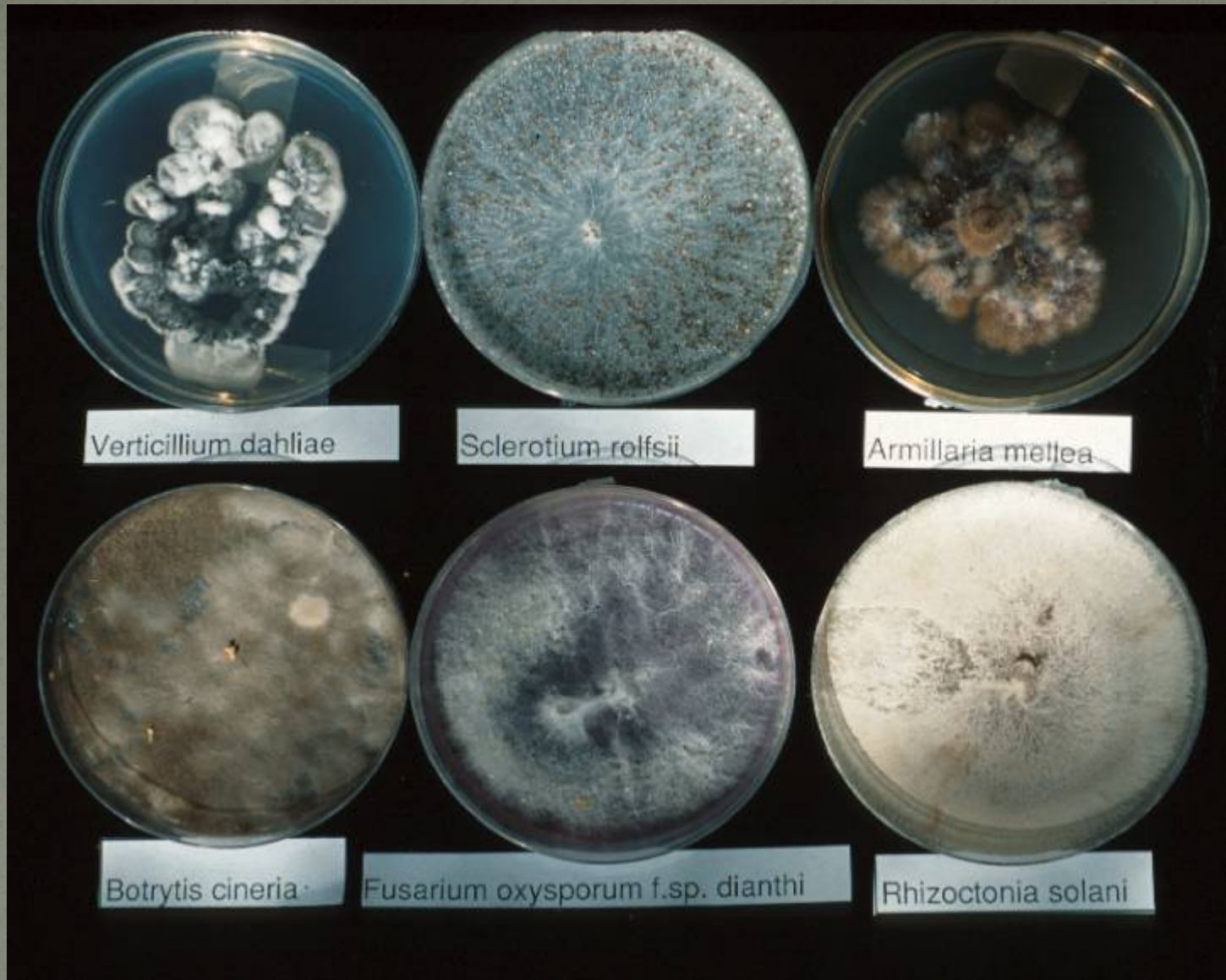
- **All stages** of the problem if possible
- **Root:** Gently remove potting mix or soil. Include tissue above and below visible lesions.
- **Stem and leaf:** Include tissue above and below visible lesions.
- **Flower, Fruit, Seed and Seedling:** Collect the entire organ.



Canker caused by *Phytophthora*

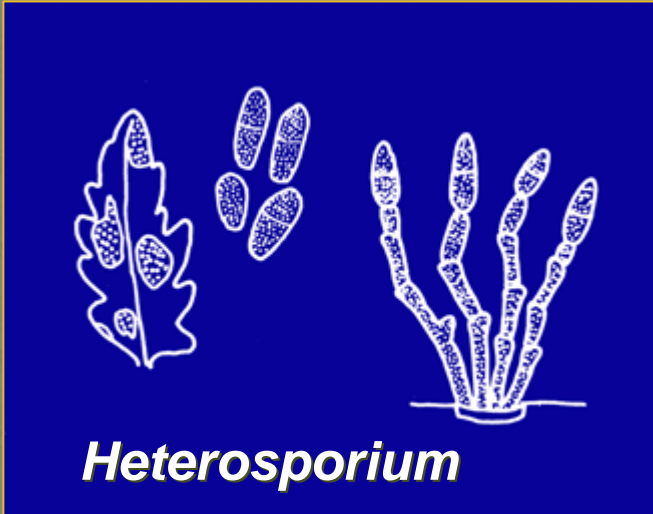
# Handling and Packing

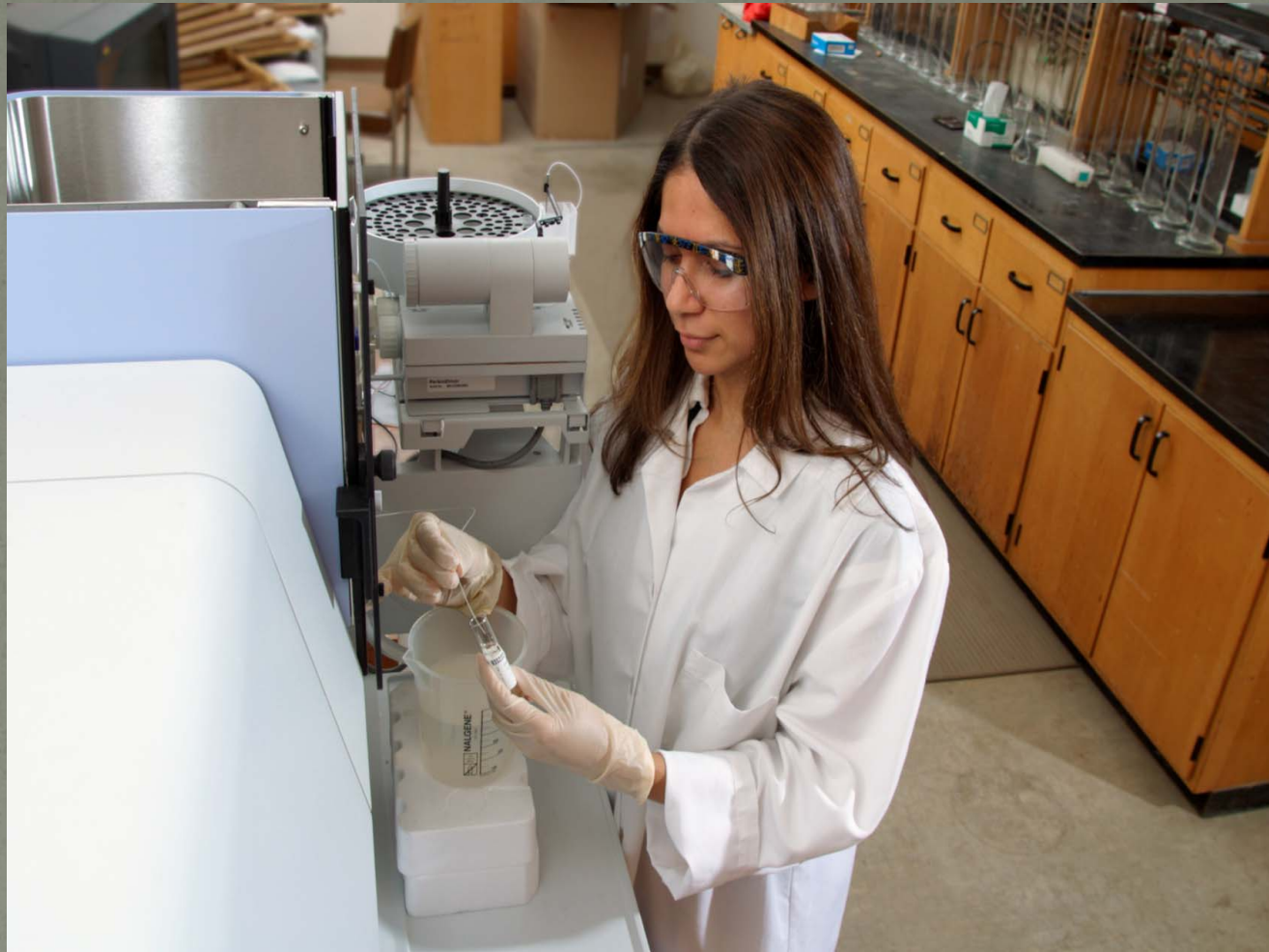
- Identify and label every sample.
- Contain the root ball, or cover the foliage.
- Package delicate material in a sturdy box.
- Do not add water or wet paper towels.
- Deliver or ship immediately overnight and early in the week.



Cultures in Petri plants are identified by characteristic spores and mycelium

# Spore structures of some fungi





Lab analysis is usually needed to confirm salt injury, specific ion toxicities, and mineral deficiencies

# Soil Samples

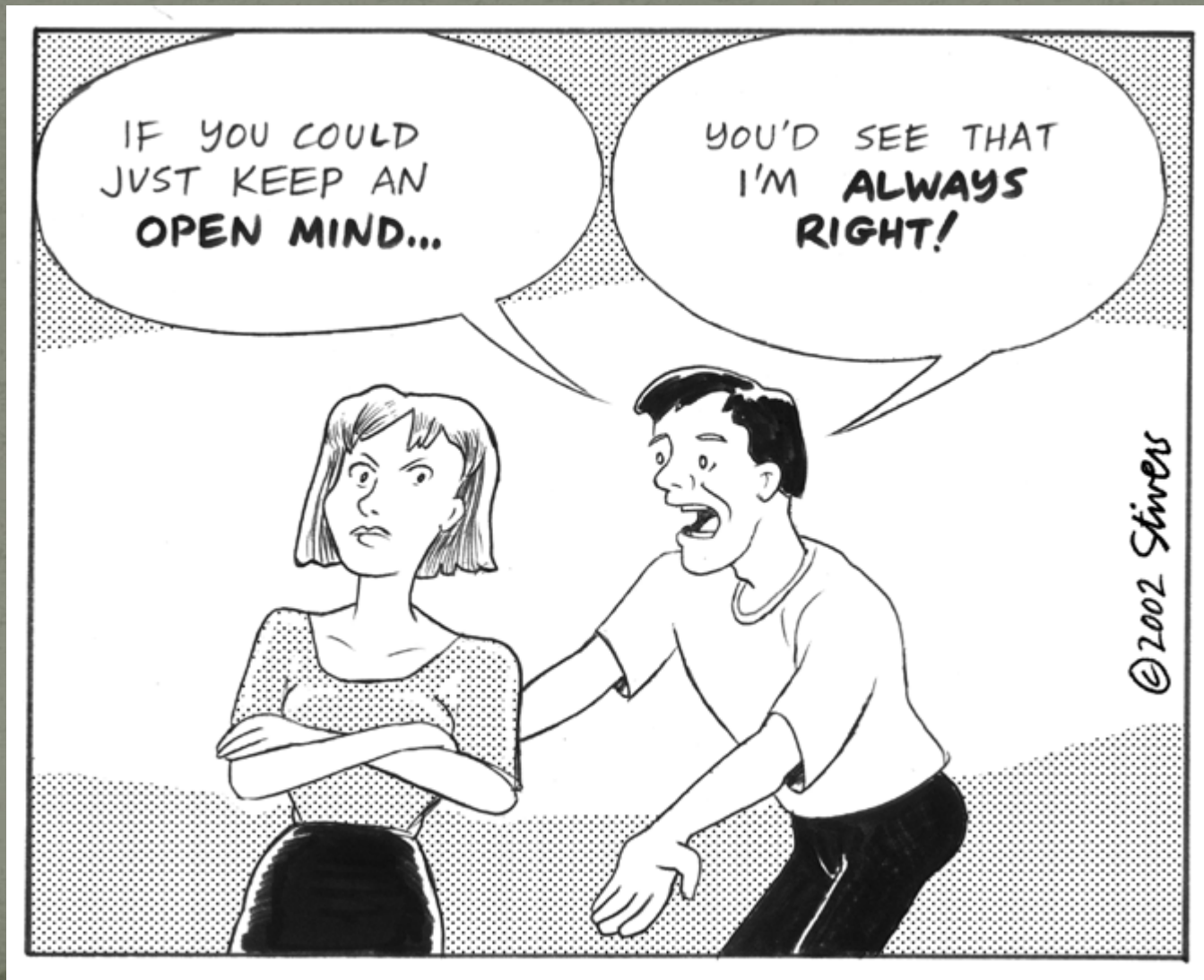
- UC does not operate soil analytical lab for public
- Commercial labs available

# Diagnosis of plant problems

## Identification: putting it all together

- Review possible problems with references, soil and water laboratory analyses, culture identification.
- Do symptoms, signs, and environmental conditions fit the problem?
- Potential complications
  - Multiple causes or secondary issues
    - saprophytic fungi,
    - insignificant insects,
    - unknown environmental issues.
  - A problem is not listed in reference material
  - Not enough information gathered.
- What is the best diagnosis?

# Keep an open mind.....



# Diagnosis of plant problems

Usually includes management information

- Control information from UC references
  - what does the client want? Cultural, physical, biological, and chemical control?
  - Pesticide label must be followed.
- If you're not confident about the identification and control
  - Inquiry information filled out completely

You can say:

“I don’t know”

“We’ll get back to you  
with the answer”

# Remember the paper trail

## A log form/specimen sheet

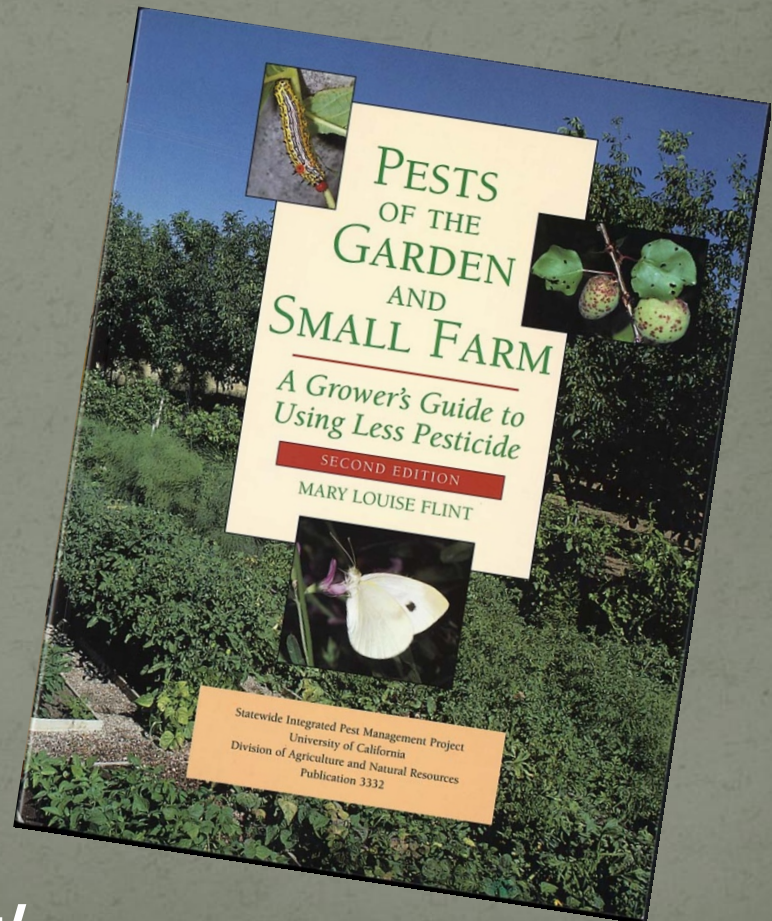
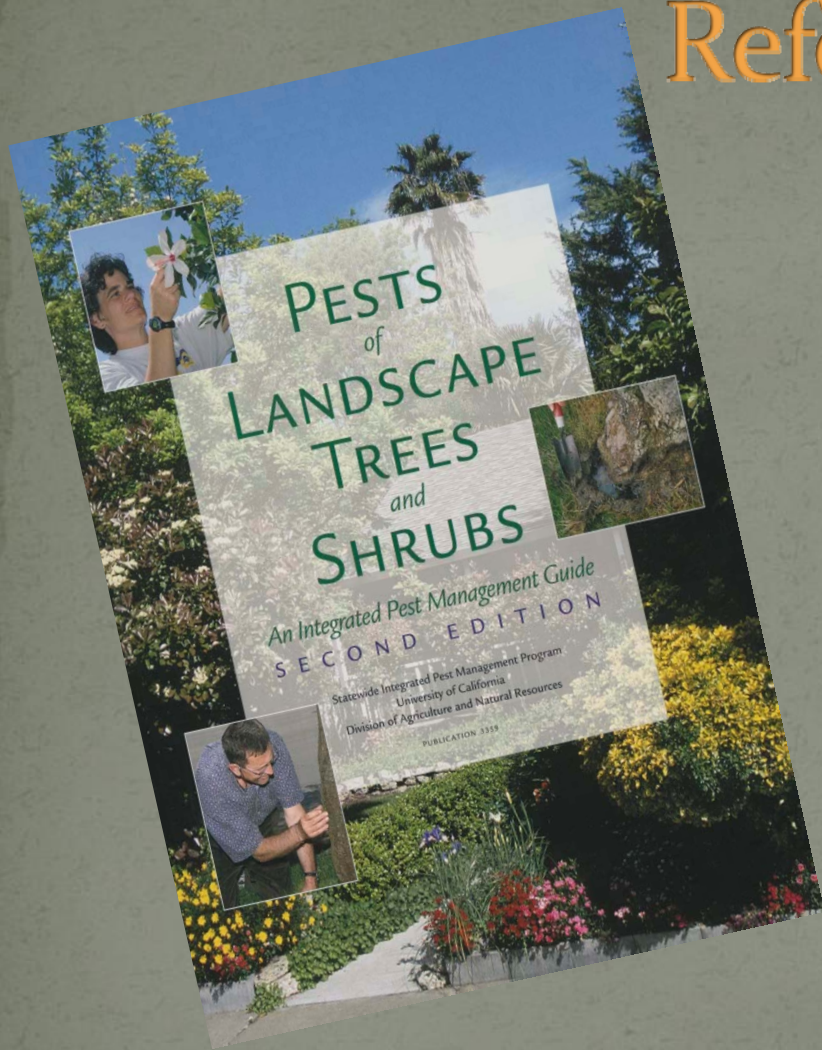
- Log form placed in pending book or completed book
- Fill out the specimen sheet on the back of the log form

# Know Your Resources



Refer to UC or academic publications and websites

# References

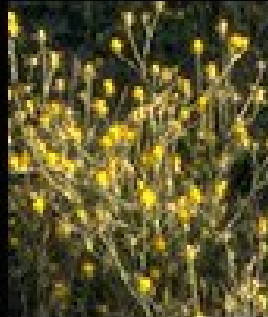


<http://anrcatalog.ucdavis.edu/>

# UC IPM *Online*



UNIVERSITY OF CALIFORNIA STATEWIDE INTEGRATED PEST MANAGEMENT PROJECT



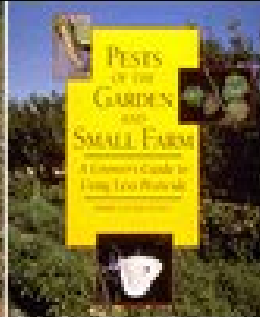
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  - ◆ [Cotton Guidelines](#), Updated
  - ◆ [2007 Exotic/Invasive Annual Report](#) (972 KB, PDF)

Solve your pest management problems with UC's best information, personalize it with interactive tools, or find out about pest management research and extension projects.

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- What's new  
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- Related links  
Western IPM Center  
Western Plant Diagnostic Network  
UC ANR: more topics

How to manage pests

**Manage and identify insects, mites, diseases, nematodes, weeds, and vertebrates**

- ▶ [Homes, gardens, landscapes, and turf \(including Pest Notes\)](#)
- ▶ [Agriculture and floriculture \(Pest Management Guidelines\)](#)
- ▶ [Exotic and invasive pests](#)

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# UC IPM Online

## STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM



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For more information, see this book:



[Pests of the Garden and Small Farm](#)

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## How to Manage Pests

### Pests in Homes, Gardens, Landscapes, and Turf

University of California's official guidelines for pest monitoring techniques, pesticides, and nonpesticide alternatives for managing pests, including information from Pest Notes and The UC Guide to Solving Garden and Landscape Problems. | [More](#) | [Acknowledgments](#) |

[Pest Notes](#) | [Quick Tips](#) | [Quick Tips en español](#) | [Recent updates](#) |

Search home and garden:

### Pests in the home

- ▶ [Household](#)—pests of homes, structures, people and pets



### Pests in gardens and landscapes

*Choose a plant to find the most likely source of your pest problem*

- ▶ [Flowers](#)
- ▶ [Fruit trees, nuts, berries, and grapevines](#)
- ▶ [Lawns and turf](#)—including comprehensive lawn guide
- ▶ [Trees and shrubs](#)—including roses and other ornamentals
- ▶ [Vegetables and melons](#)



### Pest Notes [\(In PDF\)](#)

*Detailed information for selected pests and methods*

- ▶ [Birds, mammals, and reptiles](#)—vertebrate pests
- ▶ [Insects, mites, mollusks, and nematodes](#)—invertebrate pests
- ▶ [Plant diseases](#)
- ▶ [Weeds](#)
- ▶ [Management methods including pesticides and biological control](#)



### Pesticide information

- ▶ [Hiring a pest control company](#)
- ▶ [Pesticides: safe and effective use](#)
- ▶ [Pesticides and water quality](#)
- ▶ [Information related to specific pesticides](#)
- ▶ [Other resources](#)



### More information

- ▶ [Identification helpers](#)—including [natural enemies](#) and [weed photo galleries](#)
- ▶ [Related publications](#)





Have fun!