



# Tech Talk IPM's Diagnostic Tool

presented by Ralph Thompson, UCCE Master Gardener  
UCCE Master Gardener Program of Riverside County



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Slide 1

## What is IPM?

- ❖ Integrated Pest Management, or IPM, is a process to solve pest problems while minimizing risks to human health, beneficial and nontarget organisms, and the environment
- ❖ IPM is an ecosystem-based strategy focusing on long-term prevention
  - Combination of biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties
  - Pesticides are used only after monitoring indicates they are needed
- ❖ IPM can be used to manage all kinds of pests anywhere—in urban, agricultural, and wildland or natural areas
- ❖ IPM helps residents, growers, land managers, community leaders, and professionals prevent and solve pest problems with the least unintended impacts



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## That's nice; but, What is IPM?

- ❖ California Legislature funded the University of California to establish a statewide IPM Program in 1979
- ❖ Currently 20 full-time employees
  - Draw on expertise of UC scientists and researchers to develop and distribute UC's best information on pest management
  - Research-based techniques and strategies are the basis of IPM
- ❖ UC IPM works through county Cooperative Extension farm advisors, specialists, and researchers to provide information across California



## IPM Resources . . .

- ❖ **Extensive** array of print and web-based publications, databases, books, manuals, papers, training materials, and interactive tools
  - More than 25,000 web 'pages'
  - 1,500+ Publications
    - print (books, cards, notes, posters)
    - digital (videos, DVDs, etc)
- ❖ 'Urban & Community IPM' and 'UC Ag Experts Talk' courses and webinars
  - Topics and Number vary by month and year
  - Master Gardeners may participate, but the pest management methods presented, especially pesticides, are not to be followed without a clear understanding of their legal use by homeowners



## IPM Resources (cont)

### Publications and other educational materials

Statewide IPM Program staff members work closely with area IPM advisors, farm and researchers to develop educational materials that reflect the newest advances in pest

UC IPM / Home, garden, turf and landscape / Plant problem diagnostic tool

### Plant problem diagnostic tool

Plant Types > Select plant types

Plant Names

Plant Parts

Damage

Select plant types for list of results

#### Welcome to UC IPM's Plant Problem Diagnostic Tool

To begin, choose the affected plant from the **Plant Types** photos displayed in the center of the page. Click on the photo directly or use the "+ Add to my list" button. Your selection will show in the left-hand column and will be grayed out in the main photo area. Remove any selections that do not apply by clicking on the red **x**.

Next, click on the Plant Names bar on the left to view a list of plants in your chosen category. Scroll down through the choices until you find your affected plant, then add the plant to your list. *Note: you may also view bigger versions of images by clicking on the magnifying glass icon.*

Once you've selected your plant, choose the **Plant Parts** bar from the left hand menu and select one or more of the affected plant parts. Click on **Damage** to see descriptions, then select the damage type(s) that apply to your plant to add them to the list.

Finally, click the **View Results** bar underneath your selections in the left hand panel to see the diagnoses.

The more you can narrow down your selections by choosing plant names, plant parts, and damage, the fewer potential results you'll get and the faster you will be able to find the pest or problem affecting your plant. If your search is too broad, the results will be large.

• ANR Pest Management blogs



## IPM Resources . . .

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○ print (books, cards, notes, posters)

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❖ 'Urban'

➢ To

➢ Ma

presented, especially pesticides, are not to be followed without a clear understanding of their legal use by homeowners

I estimate there are at least  
**½ MILLION**  
cross-referential links on IPM webpages

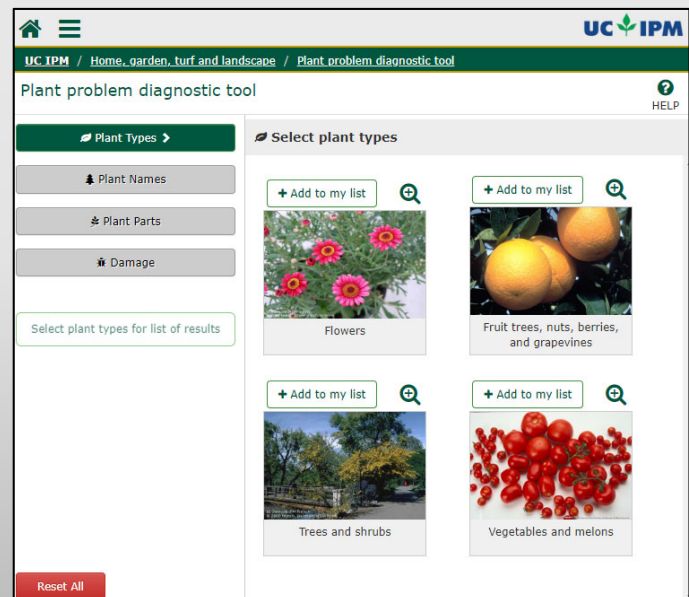


Rather than navigating through UC IPM's **content-dense** website, the **Plant Problem Diagnostic Tool** uses client inputs to generate a shorter list of possible pests, diseases, or abiotic problems; thereby helping the user to quickly verify their problem(s) and find appropriate solutions.



## Using UC IPM's Plant Problem Diagnostic Tool

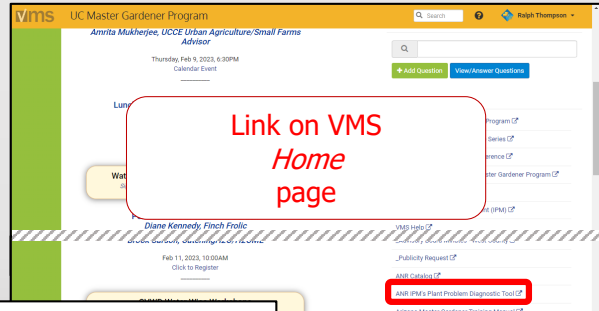
- ❖ Can diagnose 650 arthropod, disease, and abiotic problems on over 300 plant species
- ❖ Four step process “refines” the search and offers a set of diagnoses
  - Type
  - Plant Name
  - Affected Parts
  - Damage
- ❖ Results drawn from IPM database and link to IPM pages



# Getting to the Plant Problem Diagnostic Tool



Link on IPM Home, Garden, Turf, and Landscape Pests page



Link on VMS Home page

**UC Internet Resources**

The UC Master Gardener Program is designed share science-based information with the public. In addition to our many Volunteers, the following resources provide the answers to many, if not most, of your questions.

**California Garden Web**

The UC Master Gardener Program designed the California Garden Web to serve as a portal to

**UC IPM's Plant Problem Diagnostic Tool**

Rather than navigating through a website, this tool uses an image of a plant that has a problem to help diagnose the damage observed. The user can upload a photo of the plant, or choose from a list of images. The tool then provides a list of potential pests, diseases, or abiotic problems. The user can click on the appropriate link to learn more about the problem and find solutions. The tool also provides links to safe and poisonous plants.

**Link on RiversideMG website Internet Resources page**

# Diagnostic Tool – Step 0

UC IPM / Home, garden, turf and landscape / Plant problem diagnostic tool

Plant problem diagnostic tool

Plant Types

Plant Names

Plant Parts

Damage

Select plant types for list of results

Welcome to UC IPM's Plant Problem Diagnostic Tool

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Finally, click the **View Results** bar underneath your selections in the left hand panel to see the diagnoses.

The more you can narrow down your selections by choosing plant names, plant parts, and damage, the fewer potential results you'll get and the faster you will be able to find the pest or problem affecting your plant. If your search is too broad, the results will be large.

To reset your search and start over, select the **Reset All** bar. To return to the main UC IPM Home and Landscape page, click on "Home, garden, turf and landscape" in the green bar at the top of the page.

Reset All

CLOSE

# Step 1 – Type Plant

UC IPM / Home, garden, turf and landscape / Plant problem diagnostic tool

Plant problem diagnostic tool

Plant Types

Vegetables and melons

Plant Names

Plant Parts

Damage

View Results (181)

Reset All

Select plant types

Flowers

Fruit trees, nuts, berries, and grapevines

Trees and shrubs

Vegetables and melons

UC IPM

# Step 2 – Specific Plant

UC IPM / Home, garden, turf and landscape / Plant problem diagnostic tool

Plant problem diagnostic tool

Plant Types

Vegetables and melons

Plant Names

Broccoli

Plant Parts

Damage

View Results (37)

Select plant names

Artichokes

Asparagus

Beans

Broccoli

Brussels sprouts

Cabbage

Cantaloupe

UC IPM

## Step 3 – Affected Part(s)

UC IPM / Home, garden, turf and landscape / Plant problem diagnostic tool

Plant problem diagnostic tool

Plant Types: Vegetables and melons

Plant Names: Broccoli

Plant Parts: Crown

Damage: [None]

View Results (2)

Select plant parts

- Buds: + Add to my list
- Crown: + Remove from list
- Flowers/blossoms: + Add to my list
- Fruit: + Add to my list
- Leaves: + Add to my list
- Overall: + Add to my list
- Roots: + Add to my list

## Step 4 - Damage

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Plant problem diagnostic tool

Plant Types: Vegetables and melons

Plant Names: Broccoli

Plant Parts: Crown

Damage: Crown / Tunnels, boring

View Results (1)

Select damage

- Crown / Discolored: + Add to my list
- Crown / Mycelia: + Add to my list
- Crown / Tunnels, boring: + Remove from list



# Step 5 – Diagnosis Results

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Plant problem diagnostic tool

Results for: vegetables and melons, broccoli, crown, tunnels, boring

> **Diamondback moth**

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## Diamondback moth—*Plutella xylostella*

Mature diamondback moths are small, green yellow caterpillars with black hairs and are only 0.33 inch long. The body is slender and pointed at both ends, with a distinctive V formed by two prolegs at the rear end.

### Life cycle

Adult diamondback moths lay their tiny eggs singly or, less commonly, in groups of two or three on the undersides of leaves. The eggs are minute, scalelike, green white to yellow, and very difficult to spot. Larvae feed mostly on the undersides of outer or older leaves of older plants, chewing out small holes, or at the growing points of younger plants. They reach maturity in about 10 to 14 days, depending on temperature, and then spin loose white cocoons, which they attach to leaves or stems, and pupate within them.


Although they may occur all year round, diamondback moths are often abundant in spring and early summer and populations may rise again in fall. The pest has four to six generations a year.

### Damage


Larvae may cause small holes in leaves, which is usually not serious, except when the wrapper or cap leaves of cabbage are injured. Growing points or crowns of young plants may be chewed, causing stunted growth. Some larvae may bore into heads of broccoli or cauliflower, causing contamination.

### Solutions


Natural enemies often effectively control diamondback moth in California. Applications of *Bacillus thuringiensis* or *spinosad* are also very effective. Older plants are not usually seriously damaged. Destroy culls and mustard-type weeds several weeks before planting.



Diamondback moth adult



Holes in leaves caused by larva



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# Step 5 – Multiple Possible Diagnoses

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Plant problem diagnostic tool

Results for: fruit trees, nuts, berries, and grapevines, citrus, leaves, discolored, necrosis, chlorosis

Aphids  
 Armillaria root rot (oak root fungus)  
 Frost  
 Irregular fertilization  
 Lack of water  
 > **Mineral deficiencies and toxicities**  
 Overwatering  
 Phytophthora root rot  
 Tristeza disease complex  
 Whiteflies  
 Wind injury


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## Mineral deficiencies and toxicities


Evidence of lack or excess of certain minerals usually appears first in leaves but eventually affects fruit size, quality, or yield. Leaves may be pale to white or yellow, having chlorotic blotches along the veins or midribs. Leaves may also be mottled.

### Solutions


Maintain a good fertilization and irrigation program. Make sure you apply the appropriate fertilizer at the right time. For oranges and grapefruit, apply nitrogen to the soil or foliage in late winter or early spring; lemons may receive nitrogen at any time of the year. Foliar applications of potassium and especially magnesium are most effective when the spring growth flush is two-thirds to three-fourths expanded. A leaf analysis may reveal toxic levels of certain minerals such as sodium, boron, or sulfur. An excess of these may be present in the soil naturally. Provide good soil drainage, and allow for extra irrigation to wash the salts below the root zone. Deficiencies can be corrected with chelated foliar sprays.



Mottling of leaf due to manganese deficiency



Yellowing due to magnesium deficiency



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## Results . . .

- ❖ If your search brings up a large number of results
  - Limit selections when choosing plant names, plant parts, and damage
- ❖ If none of the results seem to match seen damage
  - Click the “Back to diagnostics” button and try other damage symptoms or affected parts
- ❖ To start over, click the “Reset All” button
- ❖ To return to the main UC IPM Home and Landscape page, click on “Home, garden, turf and landscape” in the green bar at the top of the page



## Demo

*Ralph Thompson*  
*ralph.catcity@gmail.com*





# Questions?

*Ralph Thompson*  
*ralph.catcity@gmail.com*



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