Recognizing Underlying Themes

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Gardeners tend to design with natural themes

- English country
- Japanese tea
- Veggie
- Bee
- Bioswales

Some factors are determined by site

- Climate
- Soil type
- Drainage

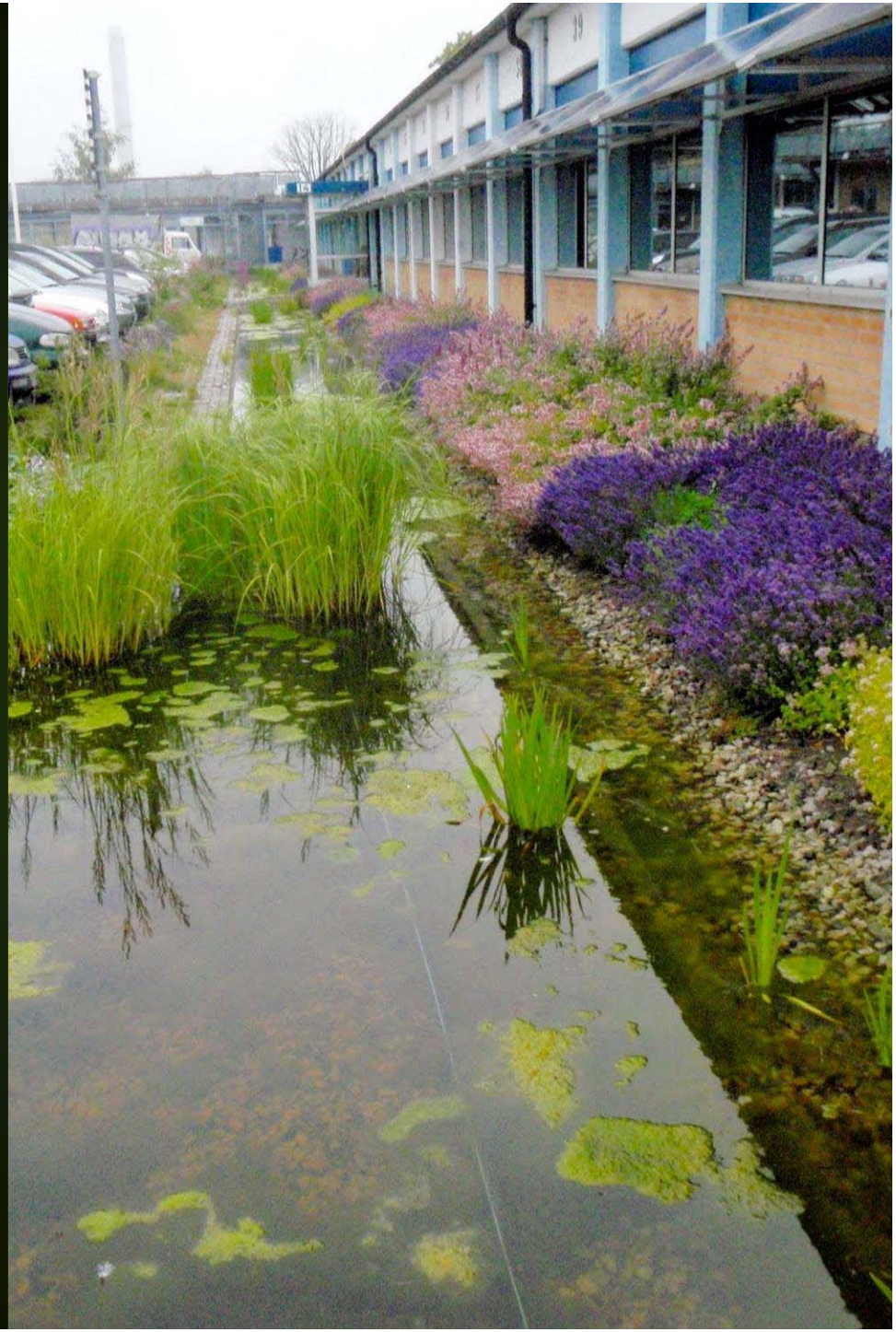


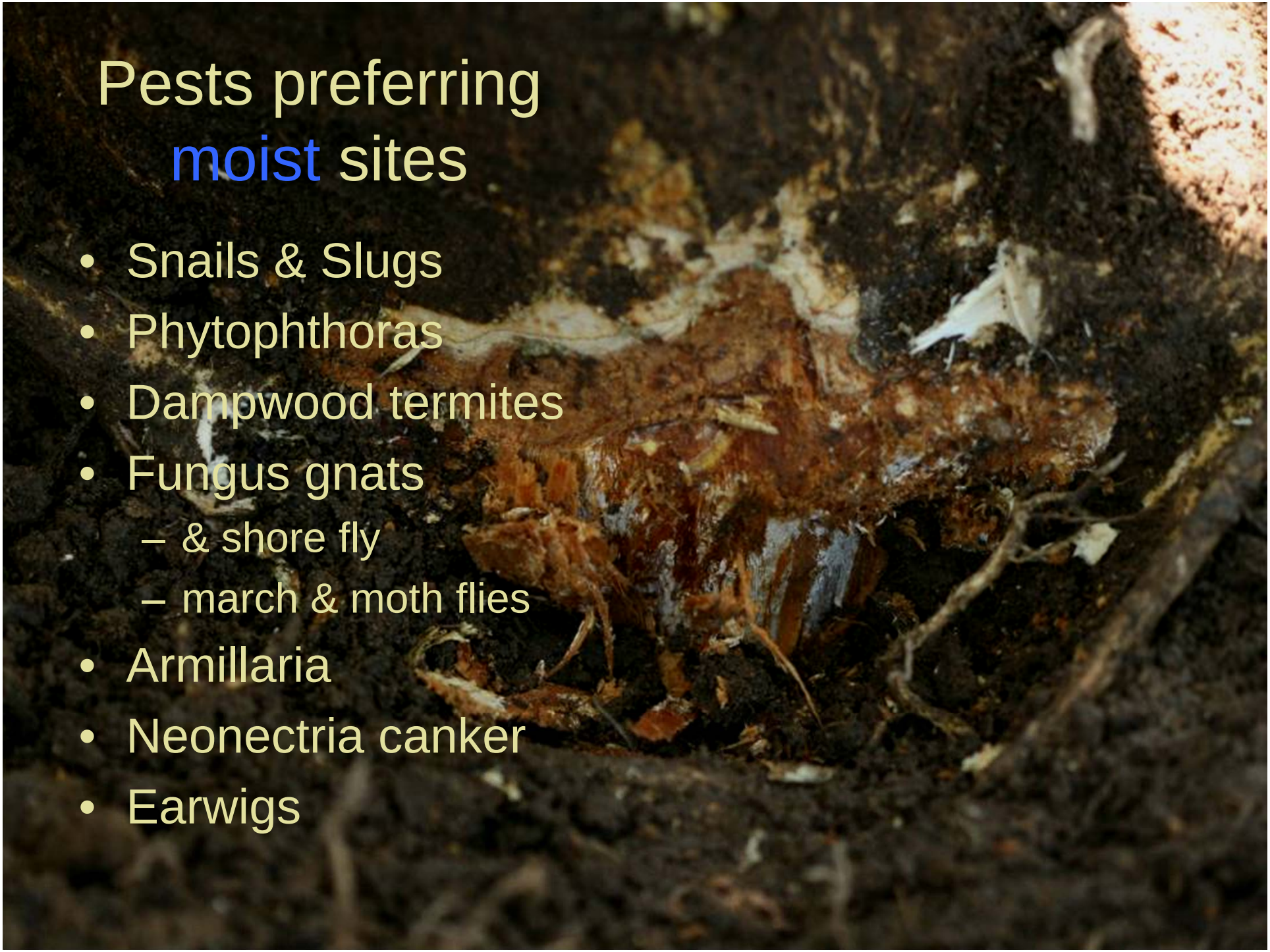

Photo: lisaknowstea.blogspot.com

To design a garden

- Pests are “designed in”
  - Elms = DED
  - Chard = leafminers
  - Pear trees = fireblight
- Well designed gardens have fewer pests
  - You can pick controls too
  - Often we’re called in to clean up the mess
- Maintenance is key
  - As important as design
- Nature has a say

All the world's a stage

- The designer sets it
- There's no script
- The living things all make up the cast
- Can you tell a tragedy in the making?
  - Let's look at who shows up, and when



Pests preferring moist sites

- Snails & Slugs
- Phytophthoras
- Dampwood termites
- Fungus gnats
  - & shore fly
  - march & moth flies
- Armillaria
- Neonectria canker
- Earwigs

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Pests preferring dry conditions

- Spider mites
- Drywood termites
- Ambrosia beetles
- Verticillium wilt
- Cypress canker
- Botryosphaeria

Pests thriving on high N sites

- Aphids
- Scales
- Mealybugs
- Leafhoppers, sharpshooters, etc.
- Whiteflies

Weeds on drought prone sites

- Prostrate Spurge
- Black Medic
- Yellow Woodsorrel (Oxalis)
- Goosegrass
- Prostrate Knotweed
- Birdsfoot Trefoil

Photo: florafinder.com

Weeds on wet sites

- Plantain
- Green Kylinga
- Annual Bluegrass
- Curly Dock
- Rushes

Weeds on Compacted Soils

- Annual Bluegrass
- Nutsedge
- Broadleaf Plantain
- Prostrate Knotweed
- Prostrate Spurge
- Goosegrass

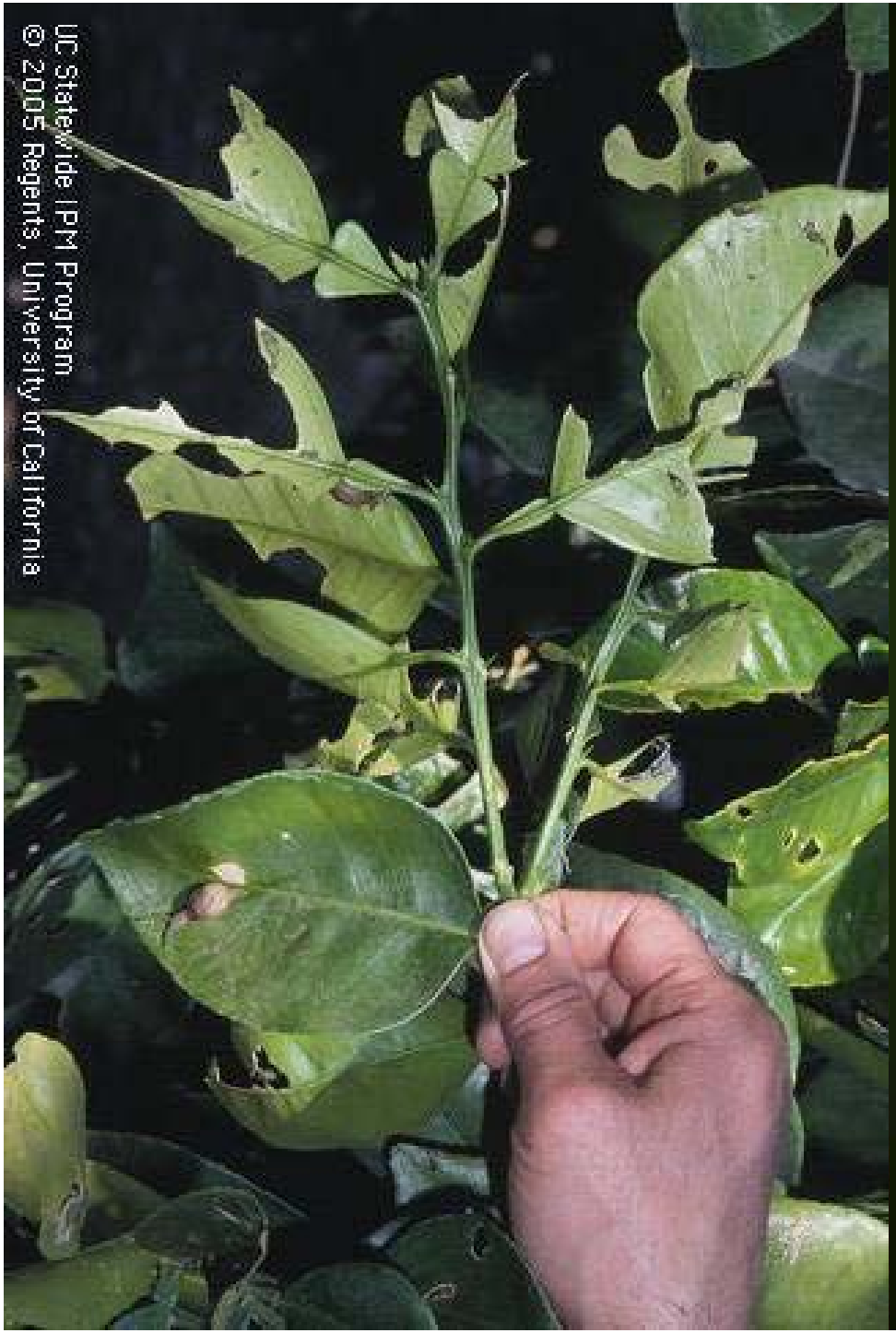
Weeds and Nitrogen Level

Low Nitrogen

- Birdsfoot Trefoil
- Black Medic
- Common Speedwell
- Clovers

High Nitrogen

- Annual Bluegrass
- Chickweed
- Ryegrass



Novato back yard

- July afternoon
- Close to house:
  - Lawn has chronic problems with
    - Plantain
    - Annual bluegrass
  - Large camphor tree on lawn edge appears drought stressed
  - Leaf holes and slime trails on lemon with thin canopy
  - Small black gnats

Novato back yard

- Far from house:
  - Lawn browning in sunny areas
  - Goose grass invading shady areas
  - Tangerine looks okay, but has stippling on leaves

Tiburon landscape

- September morning
- Lawn lush and green
  - Coarse ryegrass invading
  - Weed & feed not working
- Appears well-maintained
- Whitefly problem
  - Sheltered areas
- Aphids

Sebastopol small orchard

- June morning
- Declining apples
  - Peeling bark
  - Codling moth
- Declining pears
  - Fireblight
- Reasonably well maintained
  - Considering the weather
  - But the neighbor …

Side yard in Fairfax

- October mid-day
- Azaleas declining
- Soil level at yellow line beyond fence
- Clay soils
- Stream close by
- Dampwood termites in old stump

Novato back yard

- Water distribution
  - Close to house
    - Water loving weeds
    - Camphor decline
      - Phytophthora?
    - Lemon leaves holed
      - Snails
    - Small black gnats
      - March flies
  - Far from house:
    - Lawn browning
    - Goose grass invading shady areas
    - Tangerine with mites
- Broken line?
- Failure to hydrozone?

Tiburon landscape

- Excess fertilizer (N)
  - Lawn lush and green
    - Coarse ryegrass
    - Weed & feed not working
  - Whitefly problem
  - Aphids

Photo: news.cnet.com

Sebastopol small orchard

- Disease sources
  - Neighbor
    - Neonectria
    - Codling moth
    - Fireblight
    - All difficult to control
- Weather contribution

Side yard in Fairfax

- What do azaleas need?
  - Dappled shade
  - Acid soils
  - Water
  - Drainage
- What do they have?
  - Phytophthora

Themes

- Tons of potential themes
- Sometimes predicted by just looking at the stage
  - No drainage
  - Abandoned orchard
- Confirmed by looking at the players
  - Water distribution
  - Excess fertilizer
- If you treat the “players”, you miss the main issue
- Doomed to repeat

UNIVERSITY OF CALIFORNIA AGRICULTURE & NATURAL RESOURCES

UC IPM Online

Statewide Integrated Pest Management Program

Solve your pest problems with UC's best science

Announcements

- UC IPM Web site begins makeover
- New! Vineyard Pest Identification and Monitoring Cards

What's New

- Green Bulletin November 2011 issue
- New Year-Round IPM Programs: Asparagus, Corn, Cucurbits, Peppers
- Revised Pest Notes: House Mouse, Rats, Lawn Diseases, Bee and Wasp Stings
- More...

QUICK LINKS

- Newsletters
- Recursos en español
- Weather, models, & degree-days
- Subscribe (RSS)

Home, Garden, Turf & Landscape Pests

Agricultural Pests

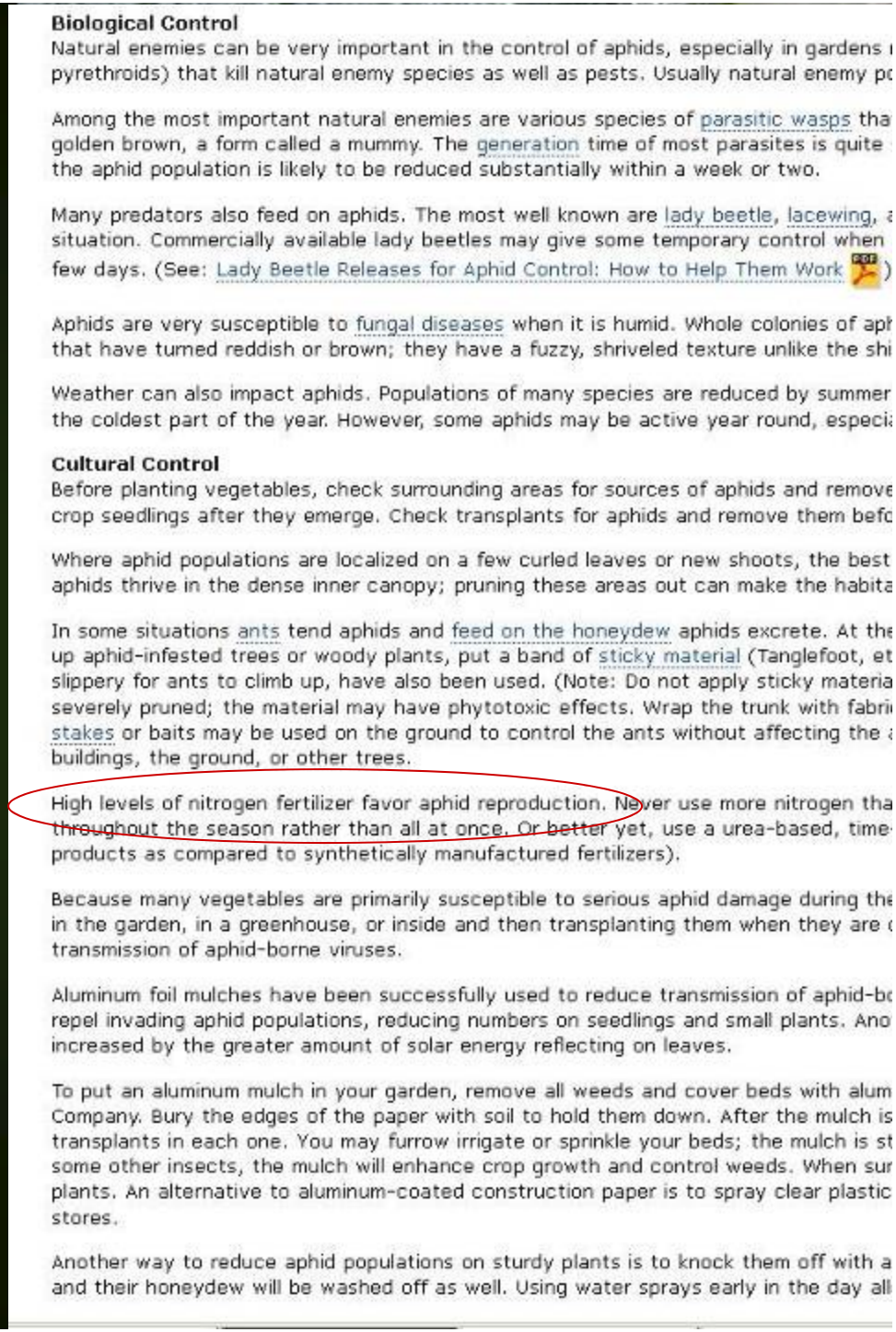
Natural Environment Pests

Exotic & Invasive Pests

Agriculture and Natural Resources, University of California

UC IPM

- Themes mentioned in management section
- Many other treatment options too
- Cultural and design options a good starting point
  - Especially if you can cure more than one problem



Biological Control
Natural enemies can be very important in the control of aphids, especially in gardens
pyrethroids) that kill natural enemy species as well as pests. Usually natural enemy p

Among the most important natural enemies are various species of parasitic wasps tha
golden brown, a form called a mummy. The generation time of most parasites is quite
the aphid population is likely to be reduced substantially within a week or two.

Many predators also feed on aphids. The most well known are lady beetle, lacewing,
situation. Commercially available lady beetles may give some temporary control when
few days. (See: Lady Beetle Releases for Aphid Control: How to Help Them Work)

Aphids are very susceptible to fungal diseases when it is humid. Whole colonies of aph
that have turned reddish or brown; they have a fuzzy, shriveled texture unlike the shi

Weather can also impact aphids. Populations of many species are reduced by summer
the coldest part of the year. However, some aphids may be active year round, especia

Cultural Control
Before planting vegetables, check surrounding areas for sources of aphids and remove
crop seedlings after they emerge. Check transplants for aphids and remove them befo

Where aphid populations are localized on a few curled leaves or new shoots, the best
aphids thrive in the dense inner canopy; pruning these areas out can make the habita

In some situations ants tend aphids and feed on the honeydew aphids excrete. At the
up aphid-infested trees or woody plants, put a band of sticky material (Tanglefoot, et
slippery for ants to climb up, have also been used. (Note: Do not apply sticky materia
severely pruned; the material may have phytotoxic effects. Wrap the trunk with fabri
stakes or baits may be used on the ground to control the ants without affecting the
buildings, the ground, or other trees.

High levels of nitrogen fertilizer favor aphid reproduction. Never use more nitrogen tha
throughout the season rather than all at once. Or better yet, use a urea-based, time
products as compared to synthetically manufactured fertilizers).

Because many vegetables are primarily susceptible to serious aphid damage during the
in the garden, in a greenhouse, or inside and then transplanting them when they are
transmission of aphid-borne viruses.

Aluminum foil mulches have been successfully used to reduce transmission of aphid-bo
repel invading aphid populations, reducing numbers on seedlings and small plants. Ano
increased by the greater amount of solar energy reflecting on leaves.

To put an aluminum mulch in your garden, remove all weeds and cover beds with alum
Company. Bury the edges of the paper with soil to hold them down. After the mulch is
transplants in each one. You may furrow irrigate or sprinkle your beds; the mulch is st
some other insects, the mulch will enhance crop growth and control weeds. When sur
plants. An alternative to aluminum-coated construction paper is to spray clear plastic
stores.

Another way to reduce aphid populations on sturdy plants is to knock them off with a
and their honeydew will be washed off as well. Using water sprays early in the day all

Cultural problem?

- What players are present?
  - Aphids don’t ALWAYS mean excess N
  - Sometimes they mean ants
  - Sometimes a good cigar is just a good cigar
- So what to do now?

Image:
Baldo
Villegas

Dormant Season

- Soils
  - Cold
  - Rainfall
  - Biological activity
    - Present (water)
    - Slow (cold)
  - Mulches
    - Benefits
    - Costs
    - Timing
- Sanitation!
- Sprays
  - Dormant oils
    - Black spot (with baking soda)
  - Sulphur (in spring)
    - Botrytis (wet, still)
    - Powdery mildew (humid)
    - Rust (splashing water)
  - Phosphonate / Metalaxyl
    - Downy mildew
- Planting dormant stock

Planting

- One dollar plant in a ten dollar hole
  - Definition of $10 hole?
  - Why should a rose be all that different from a hawthorne?
- Read the rose
  - It's telling you what it needs
- Don't dig deep (unless you can punch through to better soil)
  - Don't bother adding sand
  - Soil horizons, clay pans, perched water tables
  - Swimming pool example
- Dig a tea saucer
  - WIDE not deep
  - Cone of native soil to support the root ball
  - Fracture soil at the bottom of the cone
  - Leave the tip of the cone in place

Source: Marker Pools

Planting Height

- Don't worry so much about the bud union
  - It shouldn't be below grade (in Coastal California, anyway)
  - It's ALWAYS above the root crown
- The root crown needs air
  - Should be at or above *native* grade once a clay soil has settled
    - Flat? Above grade
    - Slope? At or just below grade
    - It's about air
  - Not so important in loams
  - If the root crown is at the right height, the bud union (graft) placement should be acceptable
    - Suckering problems? Buy better stock!
    - Add mulch

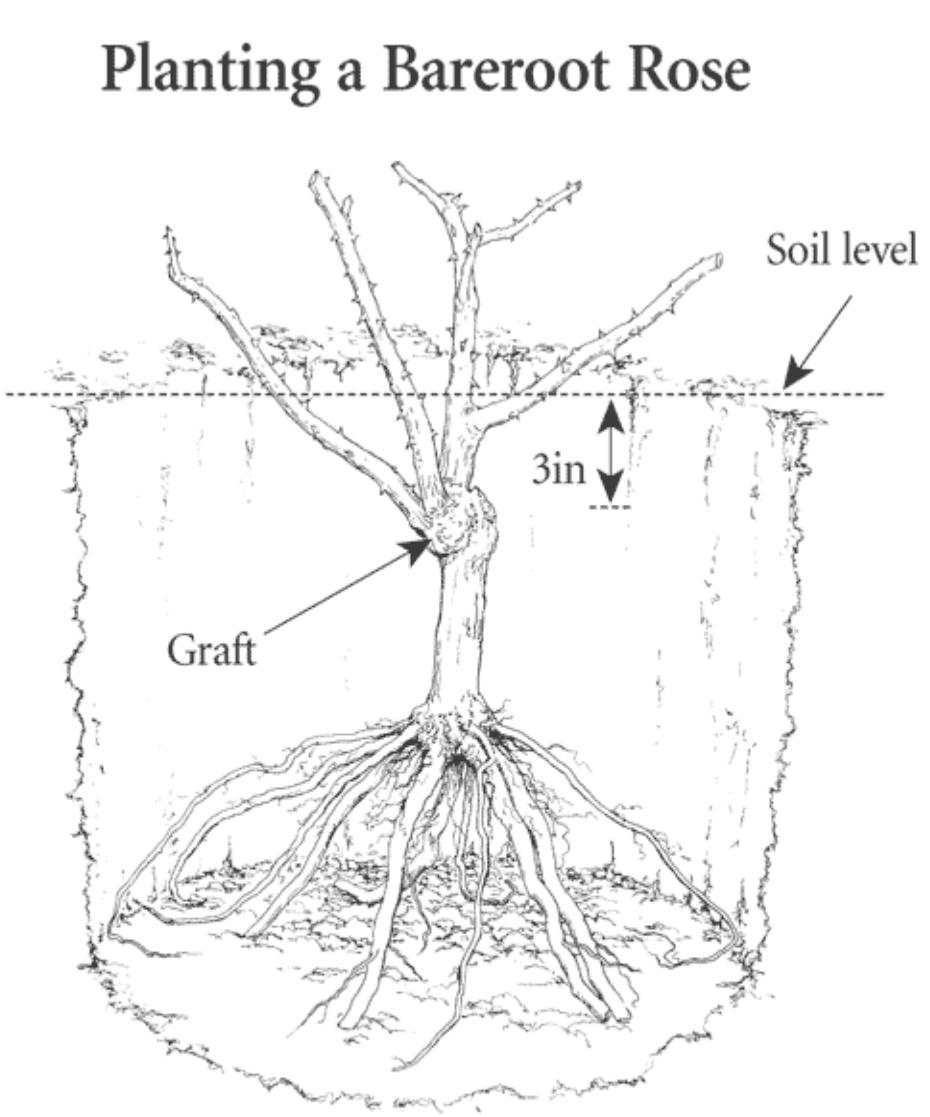
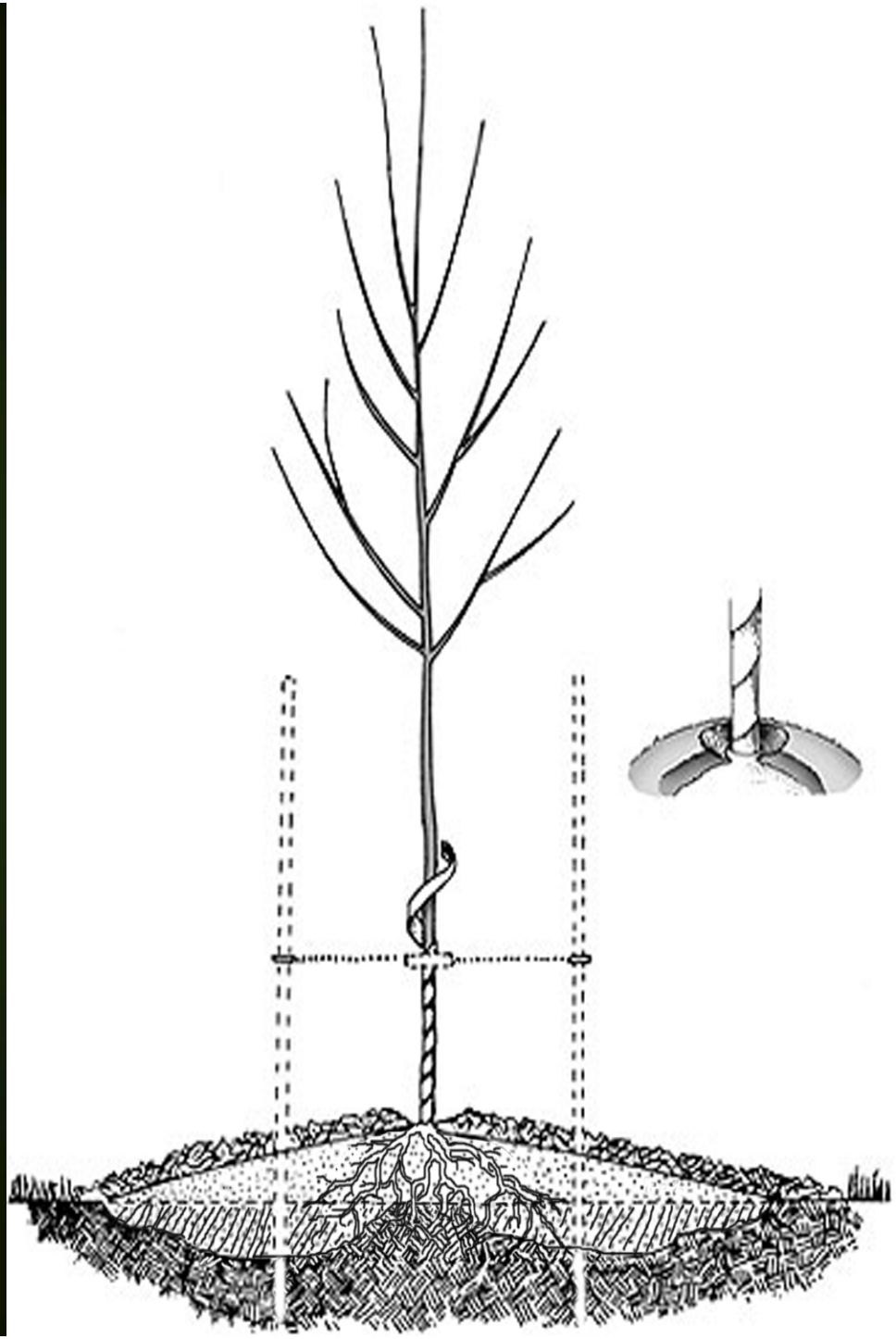


Image: http://www.whiteflowerfarm.com

Mulch

- Mixing in?
  - 3-5% organic matter
    - Any more is detrimental
    - Soils naturally can only support up to about 8% OM (unless you live in a bog, but roses don't grow in bogs, cranberries do)
  - Look to nature:
    - Organic matter goes on top
    - Earthworms till it in
  - Can't plant roses directly in concrete
    - If your soil is that bad, you'll need at least a year of prep



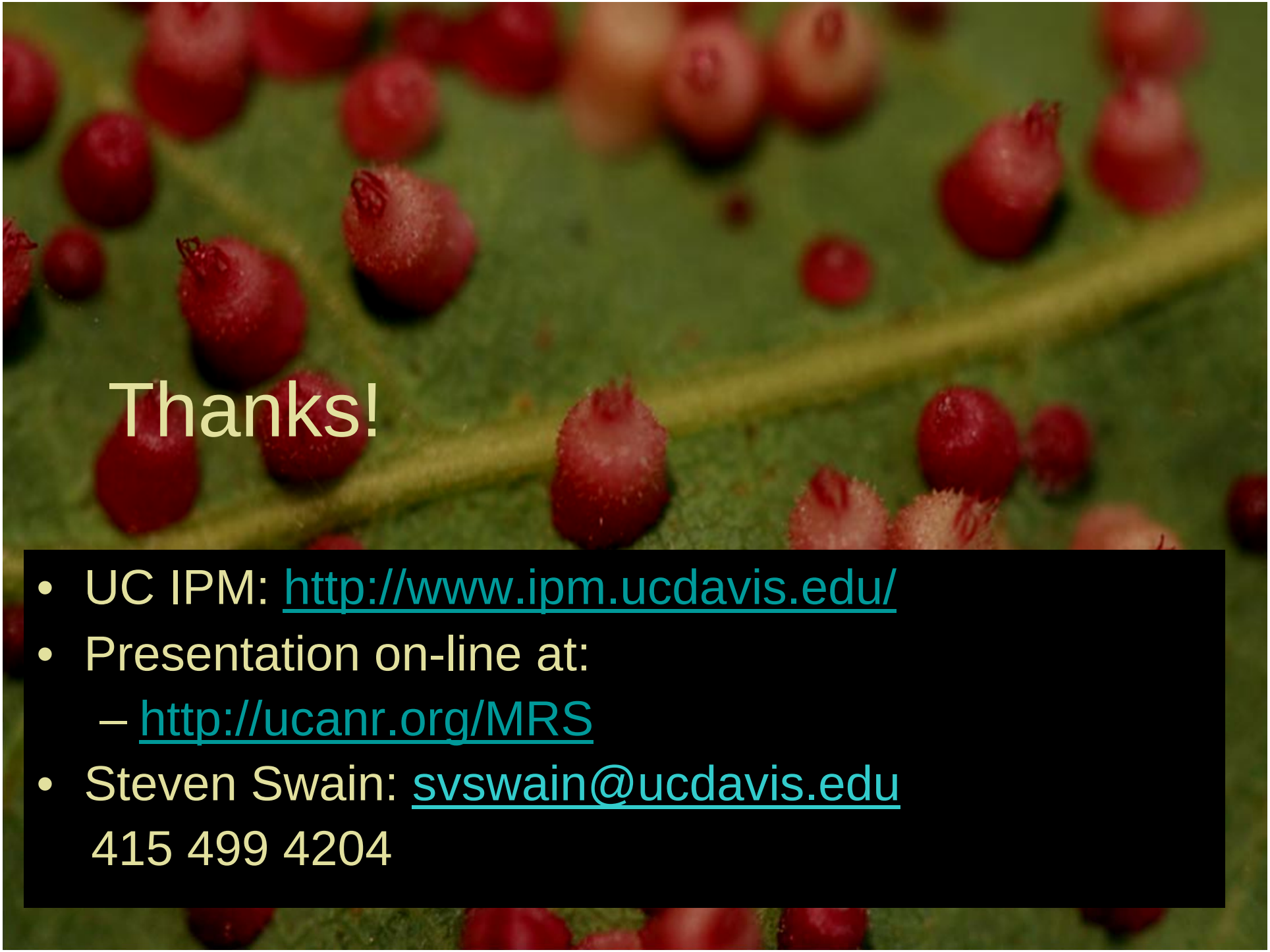
Okay, I know, you've done it

- So has my mom
- A vigorous rose will be able to correct for your errors
  - Grab onto the side of the pool to keep from drowning
  - Japanese navy pilots were taught to swim (weeded out) by simply dropping them into the water (Sakai, 1955, *Samurai!*)
    - What is the object here?
      - To get a good rose
      - To weed out the weak?
        - » Why start with hybrid teas?


Image: http://www.growingearth.com/

Food for thought

- Bud union height
- Root crown level
  - Read the plant
- Planting hole
  - Deep hole is a grave?
    - Organic matter content?
  - Drainage
- Mulch
  - Too much is bad
  - Put it on top
    - Max 5% OM in the hole



Thanks!

- UC IPM: http://www.ipm.ucdavis.edu/
- Presentation on-line at:
  - http://ucanr.org/MRS
- Steven Swain: svswain@ucdavis.edu
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