Loving our Citrus
How to care for our trees

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Lemon Blossom Heritage Farm
Claremont Garden Club
Sept 13, 2017
Lemon Blossom Heritage Farm

- Keeping history alive for future generations
- Educate the public
- Feed my family
- My test garden
Carrying on the traditions of our grandparents, and great grandparents and so on.
San Bernardino County Master Gardeners

- Part of Agriculture and Natural Resources Division (UCANR)

- Volunteers educating the public by sharing peer reviewed research done by Univ. of Cali and other universities on a wide variety of topics
• Citrus action group, invasive pests
• San Bernardino Regional Seed Library (SBRSL)
• Answer any questions you may have
Todays talk

• Healthy citrus, how to get there and how to maintain it
• Citrus greening disease
Healthy citrus

- Selecting and Planting
- Watering
- Nutrients
- Mulching
- Pruning
Selecting

- Size considerations, can get dwarf, semi dwarf, full sized
- Temperatures…less sugar in fruit, less cold tolerant
- Ripe fruit for every season?!
Planting

- Dig hole approx. 2xs the size of pot
- Add some compost, don’t make plant tooo comfy!
- Keep soil level at previous level
- Face “dog leg” north
- Plant in “N” to “S” orientation for row style planting
- Don’t plant right now at all???
Watering

- New trees: every 3 to 4 days
- Every 7 to 10 days, 14 if it's cool
- Every day? Figure out ET rate, and divide (or call master gardeners and have them do it for you!!)
Watering cont.

• Do not let young trees get dry
• Don’t go into the summer or winter “dry”
• Keep water in mind when planting citrus next to something, like grass
The “old “ days
Lawns rob citrus of water and nitrogen...
Don’t give up!!

It can live!
Mulch!!!
Pruning:

• Shape tree as it is growing
• Cut out dead and diseased wood
• Keep center of tree open, but be careful cutting outside and letting too much light in
• Can shape tree to desired size, hedge…..etc.
• Clean clippers between cutting, and when cutting diseased wood
Cut out “suckers”

- Grow below the graft union
- Will grow quickly
- Have large thorns
- Often have “trifoliate” leaves
Cut out “water sprouts”

- Grow very quickly
- Do not have good structure, so will not support fruit
- Takes energy away from rest of tree
Of Special note:

- Mandarins and some others will produce well alternate years……..its not just your imagination!!

- Can trim to reduce this effect
Feeding

- Sulfate of ammonia, ammonia sulfate
- Separate micronutrients
- N-P-K
- Chemical or Organic fertilizer
Feeding cont.

- Feed in the early spring and fall, before it gets hot/cold
- Feed evenly at drip line
- Do not feed stressed tree
- Don’t feed when it is too hot or cold
Nutrient deficiencies

• Nitrogen (N)
• Phosphorus (P)
• Potassium (K)
• Micronutrients: Iron, Zinc, Calcium, magnesium, manganese
Nitrogen (N) Deficiency
overall pale yellow on older leaves, less fruit, smaller trees, less blossom
Nitrogen deficiency
Phosphorous (P) deficiency appears in older leaves-small, bronze, margin die back ….less common in mature trees
Potassium (K) deficiency
yellowing/bronzing on leaves with corkscrew like curling
Manganese deficiency
green veins and pale areas in between
Iron deficiency
yellowing between small green veins, newer growth
Zinc deficiency
yellow mottling in between terminal leaves
• Zinc, Iron and Manganese are immobile and deficiencies are seen on new growth.......symptoms appear very similar
Calcium deficiency
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The pH values range from 4.0 to 10.0.
Common diseases:

- Quick decline, citrus tristeza virus
- Black spot
- Citrus canker
- Citrus scab
Citrus quick decline
Black spot
Citrus canker
Citrus scab
Common pests

- Leaf miners
- Scale red, black
- Mealy bug
- White flies
- Asian citrus psyllid
- Ants
- Mites
Leaf miner
Red and Black Scale
White Fly
Citrus mealybug
Spider mites
Rodents
Master Gardeners can Help!!

• Contact your local county UCANR master gardeners, Los Angeles or San Bernardino county

• Ask questions about pest and disease identification and how to deal with it in the least toxic manner, using an IPM approach

• Ask questions about ET (evapotranspiration) rate and how much water your citrus really needs

• Call their helpline or send them an email
Beneficials

- Lady bugs
- Lacewings
- Parasitic wasps
- ...and more, pollinators, birds....
Citrus greening disease

- What is the disease
- How is it spread
- History of disease
- Where we stand right now
- What's happening in riverside
- What should we do in Claremont
- Why we shouldn’t give up!???
Citrus greening disease

- Huanglongbing disease, yellow dragon disease
- HLB
- Bacteria, Candidatus Liberibacter
- Originated in China
Kills trees within 3 to 5 years of infection
Fruit becomes misshapen and bitter
Fig. 11. Asymmetrical “lopsided” sweet orange fruit from São Paulo, Brazil.

Fig. 12. Mandarin from Fujian Province, China (PRC) displaying stylar end “lack of coloration,” the characteristic leading to the common name for the disease “greening.”

Gottwald et al. (2007)
Huanglongbing (HLB) disease

Huanglongbing in fruit

HLB in trees
Disease infects all citrus

- Oranges
- Lemons
- Limes
- Kumquats
- Tangerines
- Grapefruits
- Citrons
- Alsooooooo.......Orange Jasmine and Indian Curry Leaf
Asian citrus psyllid

- ACP, Diaphorina citri
- Relative of the aphid
- Pierces and feeds on fluid from plant tissue
- Lays eggs on new growth
- Nymphs feed on new, possibly infected, growth
- Harmless, except for transmitting the deadly disease
Parasitic Wasp, Tamarixia Radiata
Citrus greening around the world

200 to 300 years ago: first appeared in China, first reported so china

1921: disease reported in Philippines

1928: disease in south Africa

1960s: HLB appears Thailand

1998: ACP arrived in FL

2004: disease in Brazil

2005: disease in FL

2012: first appeared in CA, Hacienda Heights mega graft!

Also moving through Texas, Arizona, Caribbean, Mexico and now Georgia
Citrus greening poses threat to Florida groves

Citrus greening is an insect-borne bacterial disease called huanglongbing (HLB) which attacks the vascular system of plants. HLB spread across Asia and Africa beginning in the 1940s, and first appeared in the U.S. in Miami-Dade County in 2005. It has since spread to 37 Florida counties and 9 other states.

Leaves yellowed from the veins out are a symptom of citrus greening. The tree will produce smaller, misshapen and bitter fruit, and the tree itself could die.

The Asian citrus psyllid is about $\frac{1}{8}$ inch long. The psyllid lays eggs in the foliage and spreads the HLB bacteria.

States affected by citrus greening

SOURCES: Florida Department of Agriculture and Consumer Services; saveourcitrus.org
• 90% of Florida's citrus is infected
• Production is down x billion crates
• California out produced Florida for the first time since 1943
• No backyard citrus left in Florida
• No cure for bacteria, hasn’t been cultured in lab yet
• Hundreds of cases of HLB in Southern CA. testing above legal limit
Where do we stand in CA?

- Over 100 confirmed cases
- Psyllids found as far north as Placer country, and all along the 5 and 99, ACP quarantines in central valley
- Quarantine area for ACP in **ALL** southern California counties
- HLB quarantine in Los Angeles County, also in Orange county
- HLB quarantine in Now in Riverside county
What is happening in riverside HLB quarantine area

- All non commercial fruit must be consumed on property
- Residents can be fined for violating quarantine
- No citrus for sale in HLB quarantine area
- Needing to track movements of green waste
- Commercial properties are getting treated 4 or more times a year
- All produce must be tarped
- Mandatory spraying of citrus within (800m) of infected trees
- Mandatory removal of infected trees
- Bag all citrus waste
What do we need to do

- Be on the look out for ACP
- Look for symptoms of HLB
- Contact Agriculture Commissioner if you think you have citrus greening disease
- Tell your friends and neighbors
- Support citrus industry efforts to protect our states citrus
Treat trees with ACP

- Organic options
- “Chemical” Options

Both organic and synthetic treatments can be found at your local nursery

- “Spot” treat small trees
- Ant control
- Remove unwanted trees
Yellow sticky traps
CaliforniaCitrusThreat.org

Take the Pledge!

Citrus Pest & Disease Prevention Program
What should we do in Claremont?

- Inform the public
- Inspect trees, look for Insects and disease symptoms
- Keep our trees well watered
- Keep trees well fed and mulched
- Remember they are dealing with a drought too!!
Don’t……

• Don’t share citrus foliage, and teach others about the reason
• Don’t share unwashed citrus fruit
• Don’t buy citrus from out of the area, or move
• Don’t move uncertified cuttings/graft material around at all……!!!!
• Don’t forget to clean your clippers between pruning!
What hope is there?

- Disease resistant root stocks?
- Greenhouses?
- GMO citrus?
Let's look at some soothing citrus...
The major commercial cultivar groups are hybrids, and diversify by mutation.
Lemons
Limes
Sooo many Oranges.....
Buddhas hand
Variegated pink lemonade lemon
Australian Finger Lime
grapefruit
References

• Beth Grafton-Cardwell/UC ANR web page
• California Citrus Threat
• California Citrus Mutual
• Citrus Matters
• Citrus Insider

• Tried and True or something new? Toni Siebert, Tracy Kahn Nov 2011 Article
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Please contact me with any questions, or if you would like me to present on this, or related topics:

Magoneill@aol.com