University of California Cooperative Extension • Tulare County

Citrus Notes

Volume 5, Issue 2 *August 2008*

Citrus Research Growers' Educational Seminars

2008 Series San Joaquin Valley Program

Citrus Research Board (CRB) and University of California Cooperative Extension

Bakersfield, August 27	*and*	Exeter, August 28
Hodel's Country Dining, 5917 Knudsen Drive		Exeter Memorial Building, 324 N. Kaweah

Registration begins at 8:15 a.m.
Seminar Sessions 9:00 a.m. – 2:00 p.m.
At both locations, the program will cover:

Building a "Canary in the Coalmine" for Disease Detection in Citrus
Abhaya Dandekar, Plant Sciences, UC Davis

Our California Citrus Clonal Protection Program (CCPP)
how it operates and why "clean budwood only" is so critically important
Georgios Vidalakis, UCCE and UC Riverside, CCPP Program Director

"6 in 60…"
News reports on critical issues

The Latest on the Asian Citrus Psyllid/HLB Threat, and more
Ted Batkin, President of the Citrus Research Board

Advances toward Development of a Robotic Harvester for Fresh Citrus
(More details -- What you heard last year was only a preview)
Tim McConnell, Vision Robotics, San Diego

** Continuing education credit: application pending for 3.0 hours*

$20.00 per person *includes lunch and course materials*

Advance Reservations are Strongly Recommended

Registration Coupon – Next Page

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To register, mail coupon by no later than August 18th *or* Phone (559) 738-0246 by noon August 22nd, fax coupon to (559) 738-0607 by noon August 22nd or send an e-mail message to Info@citrusresearch.org.
(You may pay at the door)

Please make ____ reservations for the Citrus Research Growers' Seminar in _____ (location)

Name: _____

Address: _____

Phone: _____ Fax: _____ E-Mail: _____

Enclosed is my check in the amount of $_____. *Make check payable to Citrus Research Board.* Mail check with this form to:

Citrus Research Board
P. O. Box 230 Visalia, CA 93279
Grower Seminar Info

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Irrigation Considerations

Poor water penetration is a common problem on the east side of the San Joaquin Valley. Users of canal or river water frequently experience slow water percolation. This may be due to a combination of factors including water quality, soil compaction, chemical fertilizers, soil crusting. Improving a soil so that the water intake rate is increased may require several corrective measures. These become particularly important in summer when temperatures create a high water demand for the plants and at the same time the soil is wetted with great difficulty. Calcium is an important chemical element in the maintenance of good soil structure. The resulting open structure increases water infiltration. When calcium is removed from the soil the soil particles do not maintain their granular condition causing the soil particles to disperse resulting in a soil that is more compact or dense. Calcium removal from the soil can result from use of low salt water such as snow melt surface water or prolonged use of sodium or ammonium fertilizers.

Agricultural gypsum is a convenient supplier of gypsum as are calcium nitrate fertilizers. Where an acid soil condition exists (pH 4.5 to 5.5) then agricultural limestone can be used in place of gypsum. Research conducted on red hardpan soils receiving nothing but canal water for five years, demonstrated as much as a 60-100% increase in intake rate with application of gypsum. Application of calcium containing nitrogen fertilizers or application of gypsum can be a valuable tool to help ensure good water penetration. Soil analysis can be helpful in determining if there is a need for addition of gypsum to the orchard.

Leaf Analysis

Leaf analysis is an effective tool for a grower for determining the nutritional status of the orchard and for developing a fertilizer program. Together with packout information which provides yield, fruit size and quality information as well as fertilizer applications in recent years, a nutritional program can be tailored to the needs of the tree with the goals of optimum production and fruit quality without unnecessary cost or fertilizer application. Leaf analysis standards for the various elements such as nitrogen have been established for 5-7 month old spring flush leaves. The best time to take the samples is late August to mid October.

Spring Leaf Drop and Twig Dieback

This office received a significant number of calls regarding dieback of terminals and leaf shedding during March and April. Typically spring flush was involved with dieback extending from the tip back to a lateral. Some or all of the new leaves on affected terminals had dropped. The condition was not varietal specific as symptoms were examined in navels, Valencias and Clementine orchards. It was not age-related as age of properties examined ranged in age from 4 years to 75 years. Samples of affected tissue were collected from a series of orchards throughout the county and are being processed for possible pathogen involvement.

There was some consideration as to possible involvement of copper because of the requirement of additional copper applications for export qualification. At this point this consideration does not appear to be confirmed in that some affected properties received only a single spray.

Heat Spell

In light of the very high temperatures experienced the second week of July, a review of an investigation conducted in the past with citrus in Indio California provides some interesting results from measurements under conditions of high daytime temperatures during mid-July. Temperatures were taken in grapefruit albedo (white portion of peel), the center of the fruit and surrounding air temperature. Temperatures of all three rose rapidly in the morning; by 11:00 am the temperature of the albedo exceeded the air temperature, however by 12:00 pm the albedo temperature was below the air temperature and remained so for the rest of the day. The albedo temperature had two peaks, one at 118 degrees Fahrenheit at 11:00 am and one at 111 degrees between 2:00 and 4:00 pm. Solar radiation measurements peaked at 11:00 am. Air temperature did not peak until 4:00 pm. Exposure to solar radiation evidently resulted in the first peak temperature of the albedo, while the second peak was a response to a generally warming environment. Exposure of grapefruit to infra red lamps for eighteen minutes resulted in an albedo temperature of 118 degrees Fahrenheit and the surface of the peel began to burn.

Leaves on Valencia orange trees exposed to the sun reached temperatures higher than surrounding air temperature, the leaf with the highest temperature exceeding the air temperature by 50 degrees Fahrenheit by 3:00 pm. The temperature of leaves unexposed to the sun was the same as the air temperature. Seedlings of Dancy tangerine, Citrus macrophylla and rough lemon exposed to infra red lamps at air temperature of 122 degrees had a leaf temperature of 147 degrees and at an air temperature of 104 degrees had a leaf temperature of 122 degrees. Under these conditions leaf symptoms were observed, the first being a cupping followed by water spots between the leaf veins, some leaves recovering, some exhibiting permanent damage. Bark temperature on the Valencia trees exposed to the sun reached a maximum temperature of 122 degrees F. two hours before the air temperature reached 118 degrees F. The maximum bark temperature was evidently a reflection of solar radiation rather than air temperature. Shaded bark temperature followed air temperature but only reached 108 degrees F.

New Crop

Being only twelve weeks from petal fall and as the new fruit sizes, a review of a study conducted on Valencia orange to examine changes in fruit from petal fall to harvest reveals some intriguing results. The study was conducted in Australia. During the two years of the study, the period from full blossom to harvest required from 56-61 weeks. Measurements from blossom to harvest identified three distinct periods corresponding to differences in the growth rate of the fruit. Each stage was characterized by distinct morphological, anatomical and physiological changes. Stage one or the period of cell division was the time of tissue formation in the new fruit. During this period the increase in size of the fruit was due mainly to growth of the peel. Stage two was the period of maximum fruit growth resulting from enlargement of the cells. Morphological, anatomical and physiological changes were very rapid during this period. Peel color changed to yellow during this period. This is a critical period for fruit growth, (in a related study in California soil moisture, winds and heat were critical factors in controlling fruit growth.) Stage three was a period of reduced morphological, anatomical and physiological change. Peel color changed from yellow to orange and there was a decrease in acid content of the fruit during this stage. Under the conditions of this study stage one lasted nine weeks, stage two lasted twenty eight weeks and stage three was completed in twenty two weeks.

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