TEXAS A&M UNIVERSITY-KINGSVILLE

CITRUS CENTER

(956) 968-2132 WESLACO, TEXAS 78596

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CITRUS PEST UPDATE

Springtime infestations of **citrus rust mite** (CRM) have been very heavy Valley-wide. Generally, in an orchard when 10-15 % of 100 fruit randomly inspected by handlens show 1-2 CRM per centimeter, the grower is advised to make his postbloom miticidal spray application. In many orchards, including some at the Citrus Center, it has not been uncommon to find 20-30 CRM per centimeter—with mite feeding injury (russeting) already appearing on some new fruit. It is absolutely essential that growers stay on top of the mite situation in their orchards, with implementation of an effective chemical control program much easier on beginning, rather than established, CRM infestations.

The **flatid planthopper**, or **citrus fulgorid**, has been prevalent in many orchards this spring. While a minor pest, it produces white waxy flocculent deposits on twigs, leaves and stems supporting developing fruit—and at times is mistaken for a citrus mealybug infestation. However, close inspection often reveals immature and adult planthoppers which readily jump to nearby foliage when disturbed. The adults are greyish-white, with wings held tent-like over the body; immatures are white, flattened with small visible developing wings. Both stages secrete copious amounts of honeydew that attracts growth of black sooty mold fungus.

Several other fruit tree and ornamental species are hosts for the flatid planthopper including: avocado, fig, pomegranate, papaya, hibiscus, hackberry, boxwood, yaupon holly and anaqua trees. On citrus there is only a single generation of the flatid planthopper each season, requiring about 60 days and completed in late May or early June. Generally, specific chemicals for planthopper control are not added to the post bloom spray; however, infestations are significantly reduced by sprays containing Lorsban 4E or Sevin 4F.

The **citrus black scale**, a pest seldom seen on Valley citrus has shown up in fairly high numbers especially in orchards in the Los Fresnos area. A soft scale species, the brownish-black female adult scale is easily recognized by its circular, hemispherical hardened covering or 'derm' distinctly ridged on top in the form of an 'H'. Turning the female scale over reveals pinkish colored eggs en mass (often 1000 or more) inside. These hatch into light brown, flat 'crawlers' with distinct eye spots and antennae. The crawlers (often disseminated by wind and birds) settle on twigs, leaves and fruit, withdrawing sap with their sucking-type mouthparts. There are two nymphal stages, with the male black scale also going through a pupal stage to mature to a honey-colored winged adult; males are hard to detect and seldom seen. Development from egg to adult requires about 90 days, and generally 2 generations 'broods' per season. Like the flatid planthopper, black scale secrete large amounts of honeydew—leading to the sooty mold fungus problem.

A spray trial comparing Lorsban 4E, Esteem EC and citrus spray oil for citrus black scale control was recently initiated in an orchard near Los Fresnos. Lorsban 4E definitely gave quicker knockdown of black scale, but the 14 day post-spray count showed Esteem EC providing excellent control of black scale immatures (> 90%). Information and data gathered from this trial will be reported in a later Citrus Center Newsletter article.

J. Victor French

Flatid planthopper adults on citrus twig and closeup (see insert).

GROWING DEMAND FOR CITRUS BUD WOOD FOR HOMEOWNER MARKET

Thousands of Meyer lemon cuttings for the homeowner market in a Texas nursery.

When the Budwood Certification program was initiated, it was aimed largely at the commercial citrus fruit industry. The threat from tristeza virus affecting the sour orange rootstock meant we had to provide tristeza-free budwood, but also had to eliminate other pathogens which affect many alternative rootstocks. The homeowner or dooryard market was also included because any uncontrolled pathogens in these trees could spread to the commercial industry. With the commercial acreage now stable, orders for budwood from nurseries supplying the commercial industry are mainly for re-sets and for blocks where the variety is being changed. There are limited new orchards being established. However, we have discovered that, in addition to the numerous small nurseries propagating citrus trees of a wide range of citrus types, there are a number of larger operations producing up to tens of thousands of trees for sale through large department stores throughout the state. The main varieties are Meyer lemon, satsumas and some limes. Some of the trees are budded, but in other cases cuttings are being propagated. The program rules have now been altered to cover cuttings. Many homeowner market nurseries interested in the purchasing of quality budwood from the program have been ordering increasing numbers of budeyes or cuttings. In all of 2002, 29,000 (60% of the total) were sold to this market, while in the first 5 months of 2003 we have sold 15,300 (95% of all sales) to the dooryard industry.

Craig Kahlke & John da Graca

BHIMU PATIL RECEIVES INVITATIONS AND RECOGNITION

Dr Bhimu Patil was recently invited to two important events in Washington DC. He was invited, along with other national researchers, to attend the Congressional briefing on Food for Health where he gave a presentation on the status of his research. In addition, his group's work on lycopene in grapefruit was highlighted several times by another speaker, Dr Charles Muscoplat, Vice-President and Dean, University of Minneapolis. Dr Patil was also invited to attend the National Level USDA Panel Review where USDA-CSREES grant applications are finalized. Prior to this meeting, panelists are required to read and rank all the submitted proposals - a major undertaking.

In April Bhimu Patil was awarded the first "Research Excellence" award in the College of Agriculture and Human Sciences, at a function in Kingsville. This is to be an annual event, and was initiated by the Dean, Dr Rosati, to recognize faculty and students who have achieved successes.

PERSONNEL COMINGS AND GOINGS

The Citrus Center recently said goodbye to some temporary, yet familiar, faces from the Functional Foods Lab, but also welcomed some summer student interns to the Center.

Marc Villalobos, who has worked for Bhimu Patil on various projects since 1999, has accepted a permanent position at the KSARC-USDA-ARS lab in Weslaco. Dr Ananthakrishnan, a post-doc in the same lab who joined us last July, completed his contract period, and is awaiting news of a job application in New York state. Two of Dr Patil's grad students also left the center - Shibu Poulose has gone to Wyoming for the summer, after which he will be in College Station to complete his PhD under Dr Patil's supervision, and Siva Muthukrishnan has moved to Ohio to begin studies in chemistry which are more appropriate for his career goals.

Another of the PhD students who has been studying in College Station, Jun Yu, has come to the Citrus Center for the summer. And, 4 UTPA undergraduate students have just begun a summer internship in the functional foods lab - Sonia Del Rio, Jasmine Williams, Julian Ortega and Jose Garza Jr.

Venkat Dannana, a MS student from Texas A &M-Commerce, has joined Dr Skaria's lab for the summer as well.

THE PROBLEM OF ROOT-BOUND CONTAINER TREES

Excellent root health of a plant is as important as a healthy shoot system. Unfortunately, we do not get to see the root system because it is hidden in the soil. In good field soil, roots normally grow well. Roots perform two basic functions: absorption (water and nutrients) and anchorage. Trees with well-spread primary and fibrous roots absorb water and nutrients better than trees with roots matted and coiled. You may not always see a prominent tap root in citrus; however, there can be several woody lateral roots and clumps of fibrous roots. The fibrous roots which are the sites of absorption of water and nutrients, originate from primary roots in all directions. In our Valley soil conditions, the fibrous roots are concentrated in the upper soil, mainly up to a foot or more deep. Fibrous root growth happens between a temperature range of 55 to 90 with 78-90 ideal for maximum root growth.

Root-bound (also known as pot-bound) is a phenomenon commonly found in container trees. It is having the roots matted and primary roots coiled. It is the result of growing a tree in a container that is small for its growth. When plants become root-bound, the following symptoms may be evident. This is true for nursery trees and indoor plants.

- Plants show poor growth and may appear wilted
- They may show symptoms of leaf burn, even with normal or low level fertilization
- Branches may show fungal growth as a secondary problem
- Primary roots may be coiled and show very little or no fibrous roots, and plants may be easily pulled out of the soil. Fibrous root bark may slough off easily.
- Primary roots may be coiled in circles, smaller roots may be tangled and/or matted, especially at the outside
- Root-bound trees, when planted in the field, take longer time to get established and will exhibit poor growth habit

When plants die, it is common to suspect fungi, bacteria, viruses, nematodes, etc. as causal agents. Normally, people try to attempt to associate an organism with the tree death; however, convincing results may not be obtained. Examination of the root system may reveal evidence of root-bound condition as the possible cause of tree death.

Left. Root is bound on sides and no fibrous roots
Middle. Desirable root system, no root bound condition, adequate fibrous roots
Right. Root-bound primary root and very little fibrous roots

Solution to the Problem:

1. Avoid root-bound condition. The container should permit root expansion without crowding. This can be achieved by using a one to four gallon containers.
2. Repot in a larger container if plants are to be held for longer periods. Make sure to cut off all circular growing roots before repotting, planting in the field or backyard. Avoid forced packing of new soil while repotting. Soil should be loose enough to allow root penetration.
3. Avoid keeping rootstock seedlings in seed trays too long.

Mani Skaria

CITRUS CENTER PERSONNEL RECOGNIZED

At a Service Awards & Retirement dinner in Kingsville on May 2, several employees of the center were recognized. Long service awards were presented to Victor French (30 years), Anastacio (Tacho) Leal (20 years), Mani Skaria & Rene Pena (15 years), and Guadelupe (Lupita) Cerda (10 years). The Staff Council presented an Employee of the Year award to Craig Kahlke, and Adolfo Munoz was amongst the university's retirees this past year.

Congratulations, and thanks for your loyal service.

John da Graca

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