December 2002

New Entomologist on Staff!

For those who have not yet heard the news or seen him in action, David Haviland recently joined our staff as a Kern County Farm Advisor. This position was vacant for a number of years. His major responsibility is entomology and pest control. His office phone is 661-868-6215. He is a very welcome and much needed addition to our staff here at the University of California Cooperative Extension.

Citrus Harvest Looks Great

San Joaquin Valley oranges haven't tasted this good in years. Kern County fruit has been some of the sweetest on record. As predicted in the June issue of this newsletter, tonnage is up which, generally, means fruit size is down. However, many blocks of seven to ten-year-old early navels produced bumper crops of large-sized fruit probably as a result of excess carbohydrate storage left unused in the tree as a result of last season's poor fruit set. The relatively warm fall weather though does appear to be aging the rind quickly in some blocks. The warm, heavy rain event that we had in November appears to have set off some anthracnose tear staining in a few blocks of oranges. Joe Nunez, Kern County Farm Advisor and plant pathologist was able to isolate a *Colletotrichum* species of fungus from the affected navels. Both Abound® and Headline® are now registered preharvest for use on citrus against *Colletotrichum* and other fungal diseases. Copper and lime sprays are also effective against anthracnose staining organisms.

Bean Thrips Unwelcome in Citrus Fruit Headed for Australia

Australians, it appears, dislike bean thrips (*Caliothrips fasciatus*) as much as we dislike Mexican or Mediterranean fruit flies. Bean thrips have been an issue with the Australians for more than a decade. David Haviland, Extension Pest Control Farm Advisor for Kern County, informs me that the Australians have recently raised the bar for California citrus fruit being imported into Australia for the 2002/2003 shipping year. Full details are available at the Kern County Agricultural Commissioner's Office but I have listed some of the highlights as they pertain to growers below:

If bean thrips are found during orchard fruit cutting, cull cutting or phytosanitary inspection, that lot of grower fruit cannot be exported to Australia. A second detection during phytosanitary inspection of a lot of fruit, from the same grower, will result in the grower's removal from the Australian export program.

If a grower wishes to participate in the Australian market, yellow or blue sticky traps are required to be placed in all navel orange blocks likely to supply fruit to Australia. One trap per 5 acres (minimum of three traps per block) is to be placed in the outside rows. If bean thrips trap catches exceed 10 per trap per week in that block, fruit from that block will be ineligible for export to Australia. Bean thrips tend to be found most readily on fruit in the lower 3 feet of the tree canopy. Traps should be placed at 4 or 5 feet, though, to avoid splash from irrigation and rainwater. Traps should be placed in the field before thrips take up residence in the navel. Typically, in future years this means traps should be in the field by November but preferably in October. Traps should be in the orchard at least two weeks before harvest occurs.

The grower, ultimately, is responsible for ensuring that fruit with bean thrips does not arrive in Australia. If one live bean thrips is found in an individual lot of fruit in Australia, for all practical purposes that fruit will be destroyed regardless of what mitigation efforts were conducted in grower fields or at the packinghouse. Bean thrips typically overwinter in the navel of navel oranges. They tend to stay in the navel unless temperatures rise above 75 degrees F. Of course, navels picked in the winter in California arrive in Australia in the summer. Frequently all Australian fruit inspectors at the docks have to do is look on the underside of carton lids to find the bean thrips arriving in infested fruit.

Weeds such as prickly lettuce, sow thistle, filaree, Russian thistle, tree tobacco, malva and many of the grasses (especially perennial grasses) provide excellent habitat for bean thrips. Keeping an orchard free of weeds help prevent this pest from overwintering in the fruit, but is no guarantee against infestation. Orchards bordering rangeland, weedy areas or streams are particularly at risk. Beans thrips are pests of beans, lettuce, tomato, grapes, cotton and alfalfa and citrus bordering these crops are at increased risk.

At least two technical employees from each packing facility will be trained on how to cut fruit and detect bean thrips. The adult insects are about 1 mm long and appear to the naked eye to be grayish black. Under the loop, you might see that the wings, legs and antennae are banded with light and dark areas. Citrus and western flower thrips have also been found in the navel, but as most of you know these insects are yellow in color.

The Fukumoto Navel: A Growing Challenge

The Fukumoto navel originated in Japan where, apparently, it is grown on trifoliate rootstocks. The positive attributes of this variety's fruit include a round shape, large fruit size and early maturity, both with respect to color and the early development of a high sugar to acid ratio. The final color is an attractive, deep, tangerine orange. The fruit sells well in the domestic and international marketplace.

The University of California's Citrus Clonal Protection Program released the Fukumoto navel to growers in the early 1990's. The oldest commercial trees in the southern San Joaquin Valley date from this time.

From its beginning in California it has been characterized as being relatively slow growing, only a fair fruit yielder, and as being prone to mutation or, as they are called in the citrus industry, chimeras. From the beginning in the San Joaquin Valley the Fukumoto navel has manifested some unusual characteristics. Two- and three-year old trees are susceptible to a disease or physiological response called 'foamy bark rot', which is characterized by splitting of the bark of the trunk and branches. A frothy gum exudes from these splits. The splits in the bark eventually enlarge into cankers. Most affected trees in the grove appear to outgrow foamy bark rot. Foamy bark rot is only rarely seen in other varieties, yet is common in Fukumoto.

Fukumoto navel can also be a prodigious producer of water sprouts, usually directly from the bud union or above the bud union. Fukumoto on trifoliate or trifoliate-by-sweet orange hybrids appear to produce the highest number of sprouts. The tendency to produce suckers and sprouts continues well past the time that sprouting typically ceases in other navel varieties. In most citrus varieties, sprouting ceases when the canopy shades the trunk. Shading does little to reduce sprouting in Fukumoto even in seven and eight-year old trees. Excessive sprout production and their subsequent removal often give the bud union a rough or warty appearance. As the trees age, large variations in growth among individual trees within the grove become obvious, especially if the trees are planted on trifoliate or trifoliate-by-sweet orange hybrids. The percentage of poorly growing and stunted trees in Fukumoto orchards are typically much higher than would be present in a block of Washington, Atwood, Fischer, Beck, TI or Newhall navels. Fukumoto navel, on Carrizo or C-35 rootstock, typically has 10% or more of stunted trees in the orchard. A closer examination of the stunted trees, if they are on trifoliate rootstock or trifoliate-by-sweet orange hybrids, may show a large differential growth rate between the circumference of rootstock and scion. Typically, the scion is of much smaller diameter than the rootstock. In these cases, the scion often branches into numerous weak scaffolds near the bud union. This scaffolding pattern looks very much like what occurs in frost-damaged trees, but in many orchards, the reduced growth of the scion appears to

have begun at planting in the absence of significant frost events in the older 1993-1996 plantings. This strange growth pattern is not commonly seen in orchards of other navel varieties of the same age, even in orchards were young trees survived the 1998-1999 freeze. Less frequently, and usually on the most stunted trees, a scion overgrowth of the bud union is present. In several groves of Fukumoto on C-35 rootstock, a significant number of trees are collapsing after as few as 4 or 5 years after planting, although it is significant that blocks of this navel on C-35 rootstock exist that show few if any problems. Why significant differences exist in the health and growth rate of trees among orchards of Fukumoto is not clear. An initial tracking of bud line material by Farm Advisor Neil O'Connell from Tulare County and myself, in excellent cooperation with citrus nurseryman, has not clarified the issue. It may be that the presence or absence of stress factors, like freeze events, thin or calcareous soils, and overwatering, influence the growth of Fukumoto to a greater degree than other navel varieties. Tree death and stunting is apparent at several locations where Fukumoto navels were planted on trifoliate rootstock in moderately alkaline soils.

Fukumoto on lemon rootstocks like Shaub rough lemon or Volkameriana, generally, show much less deformity near the bud union, but in the case of Volkameriana will produce abundant suckers from the rootstock near ground level. While the Fukumoto on lemon rootstocks are more vigorous, grow faster and produce larger yields of fruit more quickly than Fukumoto on the trifoliates and their hybrids, as with most citrus varieties fruit taste and juice percentage may not be as good, fruit maturity may be somewhat delayed and trees are much more susceptible to root rots.

Most trees in many Fukumoto navel orchards bore a heavy fruit load this season (2002/03). The large numbers of fruit though are confirming the observation that the wood of the Fukumoto navel is brittle. Scaffold branches in Fukumoto appear to have a reduced ability to support a heavy fruit load than do other varieties of navels. Many Fukumoto growers were propping up branches to reduce scaffold breakage this year. In the San Joaquin Valley it was fairly rare to see propped branches in blocks of navels, even heavily bearing navels, until the advent of the Fukumoto.

Buyers appear to like the fruit of Fukumoto navel, with some asking for it by name. The fact that the fruit is early, attractive in shape and color and has good size has created a demand that no other variety can fill in quite the same way. Efforts are underway to determine the cause of some of its problems but until they are resolved, those wishing to produce this navel variety should be aware that the Fukumoto has for some time been a growing challenge.

Glassy-winged Sharpshooter Update

Chemical treatments in Kern County have done an excellent job of controlling glassy-winged sharpshooter in Kern County (quite frankly, much better than I thought possible). The most effective strategy appears to be to treat the insects with a foliar spray when the insects are overwintering in the citrus in conjunction with a soil-applied imidacloprid treatment early spring. Glassy-winged sharpshooter populations in the Edison area have been so reduced this year by pesticide applications last winter and in the spring that many growers did not have to make a pesticide treatment immediately preharvest. Few if any reports of hitchhiking Kern County glassy-winged sharpshooter are being reported from packinghouses in Kern and Tulare Counties.

Evergreen® (pyrethrins plus piperonyl butoxide) Crop Protection EC 60-6 is now registered for control of glassy-winged sharpshooter in sweat rooms. Those wishing to use this material to control glassy-winged sharpshooter in packinghouses or in bins on trucks may want to take a closer look at this label.

Peelminer Does Disappearing Act in Kern County

It happened in the Coachella Valley and now it has happened here. Just about the time that entomologists gear up to learn about the citrus peelminer it disappears. Citrus peelminer began dying off (apparently naturally) in my test block of pummelos around mid-August amidst reports of a similar

disappearance in many blocks of citrus. Last season, in this particular block of pummelos fruit loss approached 50%. This season peel miner damage will probably be less than 5%. Infestations remained high in some blocks in Tulare County, but at least one researcher reported a similar die off in his Tulare County experimental blocks in July. These die offs do not appear to be the result of parasitism of predation by beneficial insects. Historically, this insect has shown up and down cycles in the Coachella Valley, so it is safe to assume that we have not seen the last of the peelminer. Dr. Heraty, a professor of entomology at UC/Riverside, has reported that he could not tell any difference between samples of citrus peelminer sent from Tulare County versus those sent from Kern County, strongly suggesting that there are **not** two separate species of this pest at work here in the San Joaquin Valley.

Craig Kallsen, Citrus, Subtropical Horticulture, Pistachios Advisor

Disclaimer: Discussion of research findings necessitates using trade names. This does not constitute product endorsement, nor does it suggest products not listed would not be suitable for use. Some research results included involve use of chemicals which are currently registered for use, or may involve use which would be considered out of label. These results are reported but are not a recommendation from the University of California for use. Consult the label and use it as the basis of all recommendations.