

September 2004

**GUEST ARTICLES**

**GWSS Update - Kern County**

by David Haviland, Farm Advisor  
UCCE/Kern Entomology and Pest Management  
661-868-6215

The following is a very brief and general summary of what is going on in Kern County regarding the glassy-winged sharpshooter. Compared to pest densities in 2001 and 2002, the numbers of pests detected on yellow sticky traps continues to be low. They are, however, beginning to show up in some parts of the County, and some treatments are being made.

The primary region being scrutinized is the General Beale area that has been relatively GWSS-free for 3 years since the original area-wide management program began. GWSS populations in the region have not skyrocketed, but they do appear to be creeping back. Cumulative trap catches in the region for the entire year through the first of August are mostly in the 0 to 10 range, though a couple of traps have caught 10 or more. In many cases, the highest trap catches have been associated with windbreaks in the region, and treatment programs for this summer have already begun to target these plants.

Other parts of Kern County will continue to be monitored and budgets for the program are sufficient that treatments can be made should the need arise. Also, due to trap catches north of Bakersfield, there is a proposal to expand the infested zone in Kern County to include areas north of town that are to the west of Highway 99, but still east of Highway 43.

**A New Citrus Pest, Woolly Whitefly, now Established in Kern County**

by David Haviland, Farm Advisor  
UCCE/Kern Entomology and Pest Management

Woolly whitefly (*Aleurothrixus floccosus*) is a new pest of San Joaquin Valley Citrus, and has become well established throughout urban areas in northeast Bakersfield. Numerous homeowners in the region are faced with backyard citrus trees covered in immature and adult whiteflies, with gobs of sticky honeydew accumulating on anything located underneath the leaves. Though currently only in urban parts of Bakersfield, the infestation is only a few miles from commercial orange groves.

**Identification**

Woolly whitefly is easy to distinguish from other citrus pests. Immature nymphs, which are what are usually seen first, are only found on the undersides of mature leaves. They are not on new or very old leaves, nor are they on woody parts of the tree. Immature whiteflies produce waxy filaments, from whence comes the term woolly, that become a gooey mess when combined with sticky honeydew. Undersides of leaves can become completely encrusted in these waxy, sugary exudates. As a confirmation of this pest, careful examination of the undersides of infested leaves will reveal small, whitefly adults that will fly off of the leaf when disturbed.

## **Damage**

Woolly whitefly damage citrus by sucking plant juices from the leaves and by producing copious amounts of honeydew. In the short term, it does not appear that the whitefly have a serious effect on tree health, as even heavily infested leaves appear to remain green and healthy. Over time though, research from Europe has shown that extensive feeding can weaken trees and result in decreases in the quantity and size of the fruit.

Damage to the crop can also be caused by the thick layers of honeydew that fall onto the tops of leaves and fruit. In the case of leaves, high levels of sooty mold could reduce levels of photosynthesis, whereas mold on the fruit will most likely be removed by post-harvest washing operations.

## **Worldwide and local distribution**

Woolly whitefly is a long-established pest of citrus in most citrus-growing regions of the United States and World. In the Mediterranean, for example, woolly whitefly has been one of the most important pests in France where it was first detected in 1966, as well as Spain where it arrived two years later. In the United States, records of this pest in Florida go back to about 1909 when it appeared in Tampa. It has also been reported in other citrus-growing states such as Arizona.

In California, established populations of this pest were first reported to the California Department of Food and Agriculture around San Diego and San Jose in 1987. Since that time, infestations have been found in many regions outside of the San Joaquin Valley. More locally, infestations were first detected in Ventura County in 1989 and 1990, and in Riverside and Los Angeles Counties between 1990 and 1992. Infested host plants have included citrus, guava, and melaleuca. In all of these regions, biological control organisms coupled with climatic conditions currently keep this pest to near undetectable levels.

The current infestation in Kern County is the first record of this pest in the San Joaquin Valley, and is currently isolated in an urban area of Bakersfield about 10 square miles in size. At the center of this zone, all backyard citrus trees are heavily infested with this pest, often to the extent that is difficult to see the underside of the leaf through the layers of immature whiteflies and their exudates. Leaves on trees on the outskirts of the infested zone typically have only a couple of leaves infested with low numbers of whiteflies. As of August 2004, most of the infested area fits into a loose box that is bordered by Panorama Drive to the North, Morning Dr. to the east, Niles St. to the South, and somewhere near the Old Town part of Bakersfield to the West. To date, observations of infested leaves have failed to detect any populations of small parasitic wasps that naturally control this pest throughout most other infested regions.

## **Management**

In other regions where this pest is present, woolly whitefly is under excellent biological control. Several species of parasitic wasps can reduce pest densities to nearly undetectable levels. Insect-feeding fungi also help in the control efforts. The concern in Bakersfield is that hot, dry summers are not amenable to control through fungi, and no parasite activity has been detected. It is currently unknown which parasite species, if any, would be adapted to flourish in the San Joaquin Valley climate.

For commercial farming operations, data from Arizona suggest that insect growth regulators and neonicotinoids can control this pest. The problem is that none of these chemistries are available for home use on bearing citrus. To date, no insecticides available to the general public have been identified as effective against this pest. This means that it will likely continue to spread; potentially into commercial production parts of the County. A survey program to keep track of the current and future zones affected by this pest is underway.

## **Ordering Clean Budwood from the Citrus Clonal Protection Program (CCPP)**

The next budwood cutting will start on September 22, 2004. The deadline for ordering budwood from this cutting date is September 18, 2004. Ordering information and specific information about the varieties in the CCPP Foundation Block may be obtained by visiting the CCPP website at: [www.ccpp.ucr.edu](http://www.ccpp.ucr.edu). Phone contact is available at 909-684-8580. Nurseryman and growers wishing to purchase CCPP Foundation budwood should mail or FAX (909-686-5612) their requests to:

*Citrus Clonal Protection Program  
Attention: Budwood Order  
Department of Plant Pathology  
University of California  
Riverside, CA 92521*

## **Notes on Applying Gibberellic Acid to Navels**

Typically, the price of navel oranges drops during the peak of the navel harvest season. When the peak harvest is over, orange prices often increase for navels that are harvested later. There is no mystery here. The price curve is merely following the law of supply and demand. When supplies are plentiful for most commodities, prices fall. For many decades now, growers have been extending the harvest season of navel oranges by application of gibberellic acid to retard navel orange rind maturity, and the isopropyl ester of 2,4-D to prevent preharvest fruit drop. Growers that are replanting orchards have the option of planting late-maturing navels (and have been doing so). Late-maturing navels, which have been available only during the past 15 years or so, naturally mature later than the industry standard varieties like the parent Washington or Atwood. Generally, the late navels do not require application of growth regulators like gibberellic acid. However, for those that do not have the luxury of having late navels in the orchard, the growth regulators provide an opportunity for some, to take advantage of higher prices that may come with a later harvest. The following 'notes' may help the grower in successfully timing and applying growth regulators to navel oranges.

### **Note 1A**

Dr. Coggins, emeritus professor and long-time citrus researcher at UC Riverside, reconfirmed in the late 1990s that the late September to mid-October application window, is the best time to apply gibberellic acid to navels in the San Joaquin Valley for reducing puff and crease, rind staining, and, generally, for maintaining a more juvenile rind longer. Applying the gibberellic acid two-weeks before color break remains a handy rule-of-thumb. Color break in mid-season navels (like Washington, Frost Nucellar, Atwood and others) usually occurs about two weeks after color break in the early navels (like Beck and Fukumoto). Dr. Coggins' work showed the gibberellic acid was significantly more effective when a nonionic silicon-based surfactant was included with the spray as an adjuvant. Note that the addition of an effective surfactant can increase the chance and/or severity of significant leaf drop. Always follow the surfactant's label carefully and make note of any cautionary statements regarding phytotoxicity.

### **Note 1B**

Treating with an auxin (an isopropyl ester of 2,4-D is registered for this purpose) in November or early December is necessary if fruit is treated with gibberellic acid. The auxin prevents the fruit from dropping too early. There is no point in delaying the maturation of the rind with gibberellic acid into May if the navel is going to drop from the tree in February.

**Note 2**

Uptake of gibberellic acid by the peel is improved if the spray solution is acidic. A pH of the spray solution of about 4 to 5 is recommended and several acidifying agents and products are available to accomplish this. In general, tank mixing other pesticides or nutrient solutions with gibberellic acid should be avoided.

**Note 3**

Growers achieve good results using the label recommended rates of gibberellic acid per acre using concentrated or dilute sprays. Which ever route the grower goes, good coverage is essential and good coverage is most likely to occur with higher gallonage. Most of the beneficial results of gibberellic acid are probably obtained with about 25 grams of gibberellic acid per acre.

**Note 4**

Every year at least one navel grower in Kern County reports a significant drop of fruit and leaves as a result of a gibberellic acid spray. Usually the gibberellic acid was sprayed within a week of two of a narrow-range oil spray. There appears to be a connection here, but gibberellic acid and oil have been sprayed a few days apart or even from the same tank with no ill effects. If possible, avoid spraying petroleum oils and gibberellic acid within a few days of each other. Make sure when applying either gibberellic acid or oil that the trees are not under water stress and that gibberellic acid or oil are not applied to trees that show phytotoxic affects from either a previous oil or gibberellic acid spray. The addition of an effective spreader may increase the risk of leaf drop with gibberellic acid. Monitor soil-water carefully in the fall before gibberellic acid or oil is applied. The temptation is to reduce irrigation too much in response to the first light rains of fall. Often these rains, especially in Kern County, will not meet the water requirements of the citrus, especially on the hilltops leaving the trees susceptible to damage from chemical spray applications.

**Note 5**

Gibberellic acid works best on blocks of fruit that normally hold well on the tree. The best strategy is to harvest blocks that are prone to early rind breakdown early and to treat only blocks where the fruit holds longer with gibberellic acid. Applying gibberellic acid to a block with poor fruit-holding qualities may extend the life of the fruit a few weeks, while gibbing the fruit of a good-holding block may give the grower an additional six to eight weeks of tree storage.

**Note 6**

Sometime fruit does not grow as quickly as a grower would like, and a block that was scheduled for an early or mid-season harvest may be rescheduled for a late season harvest. Gibberellic acid applications can still delay harvest (although not for as long a period of time) if treated later than October. Do not apply gibberellic acid to fruit that is in the process of changing color. A two-tone fruit may result. Wait until the fruit has turned completely orange and then apply the gibb. Check the label for application timing. Gibberellic acid can negatively affect next year's crop if applied too late.

**Note 7**

Gibberellic acid and an isopropyl ester of 2,4-D can also be applied to some other citrus fruit in Kern County with good results. Read and follow the labels carefully when applying the commercially available plant growth regulators for crop registrations, uses, timings, rates, cautions and other necessary information that will vary with citrus variety. Puff and crease and rind staining of Minneola tangelo, lemons, and some mandarins may be reduced and fruit storage on the tree may be extended by the use of these growth regulators. The timing of application is similar to that of navels in most cases.

## **Fall Sampling of Leaves**

Leaf tissue samples should be taken in September or October from non-terminal leaves that developed during the spring flush on non-bearing branches. Make sure the leaves that are sampled are spring flush leaves. In nitrogen deficient blocks, the spring flush leaves may no longer be present as a result of resorption of the nitrogen from the leaf prior to an early drop. Sampling younger leaves will yield results overestimating the amount of nitrogen storage in the tree.

The sample should include the average-looking leaves from all quadrants of the trees. The temptation, in blocks that do not look good, is to take the worst looking leaves. However, the tree has resorbed most of the nutrients from these worst looking leaves in preparation for dropping them, and information derived from these leaves is usually meaningless for deficiency situations. If a nutritional deficiency or excess is present, it will show up in the average leaf of the orchard. Growers of early navels that are not normally treated with copper as a fungicide should include this element as one of the nutrients to be included in the leaf analysis. Copper deficiency is a real possibility on trees of early maturing fruit that are not treated with fungicides and growing in some of the sandy soils in Kern County.

## **Fukumoto Navels and Alkaline Soils**

Alkaline soils can be a real problem for citrus in Kern County. Observations, and pH samples, made in some growers' fields suggest the pH of many orchards is increasing. A good nutritional program in Kern County should include monitoring of soil and water pH, boron, and salt levels.

An increasing amount of observational evidence suggests that Fukumoto navels on Carrizo, C35 and Trifoliolate rootstocks are less tolerant of high pH soils than are Washington navels and many other citrus varieties on these same rootstocks. In several locations where soil pH was tested, Fukumoto trees on trifoliolate or citrange rootstocks were dying in areas of high pH (values in the top two feet at 7.8 or higher) where Washington navel trees looked good. Lowering soil pH is advisable, anyway, for all citrus when pH levels rise to 8.0 or greater. For Fukumoto navel on Carrizo, lowering soil pH to 7.5 or below can reduce yellowing and improve tree growth. For Fukumoto on C35 and trifoliolate rootstocks, soil pH should probably be 7.0 and preferably lower. Alkalinity can be reduced with applications of soil sulfur, sulfuric acid, phosphoric acid, acid-forming fertilizers and by other means. The effectiveness of methods of lowering pH can vary widely with the acidifying agent, application procedures, soil chemistry and conditions. Injection of acidic materials can result in personal injury, crop damage and damage to equipment, valves, pumps and irrigation pipe. For best results consult with someone with expertise and experience in lowering soil pH.

## **Misshapen Navel Fruit**

There appears to be a higher than normal occurrence of misshapen navel orange fruit on the tree this season. Navel oranges in some groves are showing an overly large navel with higher levels of splitting. The reason for this problem is not known. It may be related to the smaller fruit set and warm temperatures that occurred in late April and May. Perhaps the fruit grew too big too fast. The smaller numbers of fruit in many orchards suggest that fruit sizes will be larger and yields lower this season compared to last season.

*Craig Kallsen, Farm Advisor  
Citrus, Subtropical Horticulture/Pistachios*

---

The University of California prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or status as a covered veteran (special disabled veteran, Vietnam-era veteran or any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized). Inquiries regarding the University's nondiscrimination policies may be directed to the Affirmative Action/Staff Personnel Services Director, University of California, Agriculture and Natural Resources, 1111 Franklin Street, 6th Floor, Oakland, CA 94607-5200, (510) 987-0096. University Policy is intended to be consistent with the provision of applicable State and Federal laws.