

## Field Crop Pests

This summer, Lepidopteran pests are on the prowl. The pests are not only apparent locally, but farm advisors up and down the Central Valley are commenting that it's a bad year, particularly for armyworm in rice and corn and caterpillar in alfalfa.

Armyworm is affecting rice from Escalon up through the Sacramento Valley and it was a hot topic of discussion at the Rice Production Workshop held in Richvale last week. Armyworm can be distinguished from western yellowstriped armyworm based on the appearance of the worm itself and where they lay their eggs. Both have similar coloring and striations on their sides, but while the western yellowstriped armyworm has a black spot on the side of its first legless segment, the armyworm does not. Also, the armyworm will lay its eggs on rice leaves; whereas, the western yellowstriped armyworm tends to lay its eggs on broadleaf weeds. This year could be a particularly damaging year for armyworm because their first generation flight occurred earlier than usual. According to Larry Godfrey, Extension Specialist in Entomology at UC Davis, that first generation would have fed on the leaves, and provided that not more than 25% of the leaf area was damaged, the first generation won't have affected yield. The second generation, however, could emerge to coincide with grain fill. Damage will appear as dry kernels on an otherwise green rachis. When scouting for armyworm, remember that they may not be visible during the hottest part of the day.

Three types of armyworm affect corn: armyworm, beet armyworm, and western yellowstriped armyworm. The appearance of the beet armyworm differs from the other two because it is olive green in color. What I am hearing from PCAs in our area is that, of the three pests, armyworm is causing the trouble this year. Armyworm will overwinter as larvae in the soil and emerge in the spring to feed on small grains or weeds. They're particularly attracted to barnyardgrass, so control of this weed is important in the control of the pest. The problem with

all three of these pests is that they feed en masse and skeletonize leaves. This can be particularly devastating for silage crops but can also be a problem in grain crops if the damage to leaf area reduces the photosynthetic activity needed to produce the ear. As the armyworms get older, they can also feed on tassels and ears. The pest is most easily controlled when less than a half inch long.



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*Armyworm larva, photo by Jack Kelly Clark*

Finally, farm advisors in the southern part of the valley are reporting that alfalfa caterpillar is prevalent. Alfalfa caterpillar is an olive green color. It's hairy when it's young, and it has a prominent white stripe down its side when it's full-grown. Young caterpillar damage appears as shotholes in the leaves. The pest can cause devastating damage if the life cycle aligns with the growth cycle of the crop, such that the adult is present when the crop is about halfway between cuttings. The adults will consume the foliage and reduce yields. If the eggs are present about halfway between cuttings, however, they will not have enough time to mature and cause damage, and the cutting itself will control the pest. I am not aware of this pest causing severe problems in our area, but keep an eye out for these symptoms. I'd be curious to know if you're experiencing problems with this pest.

For all of these pests, we recommend monitoring and managing according to the UC IPM pest management guidelines (<http://ipm.ucdavis.edu/PMG/crops-agriculture.html>). Thresholds for these pests, in particular for rice and alfalfa, can help guide treatment decisions.

Michelle Leinfelder-Miles, Farm Advisor, Delta Crops

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## Crop Digest: Grapes

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After two cooler than average seasons, 2013 is trending warmer than the past few years. The season did start out just a few days behind average at budbreak, but warm days and even warmer nights added growing degree days (GDD) quickly. When the hot spell hit in late June- early July, accumulated GDD were about 12 to 14 days ahead of average. Some color in Zinfandel occurred as early as June 23<sup>rd</sup> but the 100° F degree days seemed to actually stall veraison, by observation anyway. As harvest approaches it looks like ripening is back on track, but still a good 10 days ahead of the long-term average. The number of 100°+ days has not been excessive with about 6 total for the District. An average number for a season is about 17 to 19; putting the season on a "normal" if slightly earlier so far.

Growing conditions have been warm and dry. As a matter of fact my truck windshield has shown very few days with any morning dew. Most years it seems many mornings will begin with significant dew on the windshield. This year I can literally count on one hand the number days where dew was present, with half of those just recently. Many very windy days may have contributed to this. There have been lots of windy days through April, May and June, but warm temperatures until mid-July. Although powdery mildew was somewhat slow to cause concern; disease pressure has been severe since bloom in early May. Two observations (no data) come to mind: 1) although we haven't had rapid and severe fluctuations from cool to hot, there has been a fair amount of sulfur burn this year; 2) glyphosate seems to work slower this year, irrespective of resistance issues with some selected weed species. Mite problems have flared somewhat in the last month, but still occurring scattered and inconsistently. It seems one benefit of the ongoing and ever present vine mealybug concern is that leafhopper problems are almost nonexistent.

The positive aspect of weather this year is that the winter rains mitigated the dry soil conditions. This year's total rainfall was 15.8 total inches in the North County, but heavy fall rains helped recharge the lower root zones to mitigate this year's record-challenging dry spring.

The crop looks to be about average across varieties; exceptions on the plus side depending on vine age, variety, site, and grower/winemaker goals. The first Zinfandel berries with color only began to show on June 23<sup>rd</sup>. This is compared to more typically beginning to show color and berry softening around Independence Day. Cluster counts are good, in many cases as good as last year, but cluster size and set varies, by variety and location. This may be the effect of somewhat erratic temperatures during a rapid bloom period. Overall berry size may be smaller this year as extremely dry conditions prevailed during early spring development of berries.

Little to no berry shrivel is apparent this year as harvest approaches, but some sunburn, raisining, and berry cracking are easier to find this year.

The demand continues improved for most varieties such as Cabernet Sauvignon, Petite Sirah, Muscat varieties, red Zinfandel, and even Merlot, among others. Many other varieties such as Chardonnay and Pinot grigio (gris), Pinot noir, Sauvignon blanc, still seem to be in good demand. The mini-boom in planting new vineyards and the replanting of old harkens back to the "Mega Booms" of the 1970s and 1990s. The problem does remain of the general economy sluggishness and its effects. Local growers and agriculture overall are still in a relatively good position compared to most other sectors of the state and national economy.

Vine mealybug is still spreading through the county, so be aware of any new infestations, often indicated by sooty (black) mold or excessive honeydew in clusters, spurs or cordons. A high degree of ant activity in and around vines can also indicate problem spots. Good places to focus on a first look are where birds tend to perch or roost. The light brown apple moth (LBAM) continues to expand its territory in the south county around Manteca since it was found in 2009. It is similar to omnivorous leafroller (OLR); somewhat in appearance, also in the number of host crops, and definitely in damage; but also in control. It does appear in some areas of the state LBAM populations are showing the effects of control by native beneficial insects. Learn more about LBAM at: [www.ipm.ucdavis.edu/EXOTIC/lightbrownapplemoth.html](http://www.ipm.ucdavis.edu/EXOTIC/lightbrownapplemoth.html). The Ag Commissioner's staff is working hard to monitor both of these threats.

Another more recent problem is 'Grapevine red blotch-associated virus' (GRBaV). It has become apparent in the last couple of years, although it has possibly been around for much longer. Newer vineyards and some more established blocks seem to have trouble reaching full maturity and/or color. The virus is very similar to other grape leafroll-associated viruses (GLRaV), but without the rolling of leaf margins and more blotchy red leaf appearance on red varieties. The virus can be detected with newly developed tests. If you have had a problem in recent years with newer blocks, talk it over with your PCA and grape buyer, give me a call or check out the web site at UC Davis for Integrated viticulture: [www.iv.ucdavis.edu](http://www.iv.ucdavis.edu).

This year an average grape crop may help maintain a balanced inventory in the wineries and slow any potential price drops. For individual growers costs and regulations continue to increase, but better prices and more recognition for affordable wines of excellent quality can help sustain operations during the ongoing onslaught of rules, regulations and inflation. There are lots of unknowns yet to unfold, but Lodi and San Joaquin County are in a good position to continue the tradition of quality wines of value.

Paul Verdegaal, Farm Advisor, Viticulture and Pomology

## Curly Top Disease in Vegetables

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We are in the midst of an epidemic of curly top disease, primarily affecting crops further south in the San Joaquin Valley but also affecting this production area as well. It has been affecting tomatoes, peppers, melons and squash. Curly top disease is caused by two different viruses – *Beet mild curly top virus* (BMCTV) and *Beet severe curly top virus* (BSCTV). Note that the “mild” and “severe” refer to symptoms on beets, not tomatoes. Both of these viruses were found in San Joaquin County fields, with some plant samples coming back positive for both viruses. Testing was graciously provided by the lab of R. L. Gilbertson at UC Davis, which is studying these viruses. The virus is vectored by the beet leafhopper, and this is the only way that the virus is spread.

The California Department of Food and Agriculture manages a statewide program, the Curly Top Virus Control Program (CTVCP) to control the beet leafhopper (BLH) vector. Growers of susceptible crops pay into the program based on production (cents per ton, with a tiered system based on districts). They monitor populations of BLH in the coast foothills using sweep net surveys, and they spray areas when a threshold number is reached and when restrictions on spraying allow them to treat. The goal is to kill BLH before they migrate down to the valley floor. They also survey and spray fallow fields and roadsides in various districts of the San Joaquin Valley during the summer. By mid-March, CTVCP staff reported that populations in the foothills west of the southern San Joaquin Valley were twice the average number. The winds we had this spring interfered somewhat with the spray campaign, but almost 40,000 acres were treated in Fresno, Kern and Kings counties between March 27<sup>th</sup> and April 19<sup>th</sup>. Unfortunately, by mid-April, there was already a very high incidence of curly top in tomatoes on the valley floor. For more information and to see monthly reports on the state program see: [http://www.cdffa.ca.gov/plant/ipc/curlytopvirus/ctv\\_hp.htm](http://www.cdffa.ca.gov/plant/ipc/curlytopvirus/ctv_hp.htm). You can also contact the program to sign up to receive the monthly reports via e-mail. There you will also find photos of BLH adults and nymphs (although note that nymphs can vary widely in color).

Surveys of the foothill vegetation were not conducted as far north as San Joaquin and Contra Costa counties, based on observations in previous years that no BLH were found this far north. The hoppers do not like the denser vegetation and grasses which our higher rainfall generally supports. The CTVCP has indicated, however, that they will be surveying the foothills bordering our production area this coming winter.

In my eight years here in this county, I had only seen curly top in two fields, and although I was well aware of this spring's news from down south, I did not expect that it would affect us to any significant extent. The first indications to me that this county was going to be affected by

the epidemic were phone calls and farm calls in the last half of May. The highest incidences were in fields south of I-205 (some with 20 to 75% plants infected), but some fields north of I-205 but south of highway 4 were also impacted (10 to 20% infection rate). The virus was present in every tomato field I have seen this season; though, in most fields the incidence was so low as to not be a concern. So while the distribution was widespread, the hot spots were fairly localized; although, even within the most impacted areas, there are fields that look much better, demonstrating the unpredictability of this disease. There was even an affected field below Camanche Reservoir, suggesting that BLH might have also come out of the Sierra foothills (alternatively, they may have flown across the valley, which I am told is not outside the realm of possibility). In San Joaquin County, the disease has appeared in tomatoes, squash (both pumpkins and other winter squash), as well as in peppers. Thus far, it has not been detected in watermelons or cucumbers.

### Could growers or PCAs have done anything differently to avoid the losses?

Not much really. The theory is that this winter's drier conditions may have been beneficial for the leafhoppers. The lack of rain in late winter meant that the foothill vegetation dried down faster and earlier than normal, which has been suggested as the cause of a rapid migration of BLH to the valley floor during tomato planting.

Monitoring tomato fields for beet leafhoppers with a sweep net does not appear to be a worthwhile endeavor. BLH does not prefer tomatoes, and will not stay in a field for long before they keep moving on in search of a suitable host plant. Sticky traps might be more informative, but still would be of limited utility because sprays would need to be timed to coincide with migrations, which might only occur over a day or two, so this is not really a feasible option. If one was aware that a migration into a field was occurring, however, the thinking is that a foliar-applied insecticide may be warranted to control the leafhoppers.

Some SJ Co. growers did choose to treat fields with imidacloprid or other insecticides and felt that it was beneficial in slowing the rate of new infections. We know that insecticides will not be entirely effective at preventing virus transmission because the leafhoppers are moving in from outside the tomato fields and can transmit the virus in less time than it takes for them to die from the insecticide. Nevertheless, since BLH are highly mobile and retain the virus for their entire lifetime, even if it takes some time to kill them, you still may have reduced the number of crop plants to which they have transmitted the virus. In fields with buried drip irrigation, the relatively low cost of injecting imidacloprid through the irrigation system was likely economically justifiable this season in the higher risk areas, while the value of higher cost foliar sprays has to be critically assessed in light of the risk of curly top (which in a normal year would be very low in this production area). Another practice in areas further south which

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face curly top risk annually is to establish higher plant populations (closer spacing or multiple plants per plug) to take advantage of the ability of tomatoes to compensate for missing plants.

### Why are some fields more affected than others?

Proximity to the coast foothills would normally be considered the strongest predictor of curly top risk. However, this year that did not seem to be the primary explanation for why some fields were more affected than others. It has been suggested that there may be variety differences in attractiveness to BLH. While I was not able to detect such an effect in my 1-acre variety trial (13 varieties which ranged from 13 to 17% curly top), other fields which contained variety splits demonstrated this phenomenon wherein curly top incidence was lower in one variety than another. Another factor is that BLH are attracted to sparse vegetation and would be attracted to plants bordering on open ground. Finally, if the hoppers had found a host weed to settle down on but were subsequently disturbed by mowing, disking, weeds drying down or herbicide applications, then the BLH would pick up and move, potentially moving through and infecting nearby tomato fields.

### Is there anything to be done now?

My surveys of weeds in June and July (with assistance from CTVCP staff) found that the weed most commonly harboring BLH in our area was bractscale (also called stinking orach or saltscale, *Atriplex serenana*). This weed is currently in flower (Figure 1) and has an awful smell when the leaves are crushed, making it fairly easy to spot and identify. This weed appears well adapted to growing along farm roads, ditches and on the sides of Delta levees (Figure 2). It is known to be a breeding host for beet leafhopper and indeed we can find young nymphs on it now. Other weeds known to be attractive to BLH include pigweeds, goosefoot, mustards, and Russian thistle (especially in later in the summer into fall). Note that some weeds can also harbor the virus, but are generally not symptomatic. To minimize curly top risk, the recommendation is to keep weed pressure down in the vicinity of tomato fields. And when disturbing weeds by disking or mowing, they should first be treated with an insecticide where possible. If spraying weeds with an herbicide, consider adding an insecticide to the mix when possible. If you need help identifying the leafhoppers, please let me know. There are other leafhoppers present in weeds and crops which are not vectors of the disease; the most common one I pick up in my sweep net is the potato leafhopper which is a bright green (in contrast with the pale green to tan of adult beet leafhoppers).

As I mentioned earlier, the CDFA CTVCP program is authorized to spray fallow fields and as I write this they are preparing to spray 400 acres in the Banta/Tracy area which are fallow and have some areas of host weeds which are harboring BLH. They are also meeting with

CalTrans and hoping to obtain permits which would allow them to spray along I-5 and other roadways managed by the state agency.

Currently, the safflower crop is nearly dry. But where there remains any green in the field, you may want to look for BLH and consider spraying if present (as of July 30<sup>th</sup>, we found BLH in a drying safflower field in Tracy). In addition to the risk BLH present to the current season's crop (although risk diminishes as the crop approaches maturity), we also need to think about the fact that these hoppers will be migrating back to the foothills in the fall to overwinter, and potentially return in the spring (or perhaps they can survive the winter on the valley floor?). On a positive note, it is likely that this was just an odd year whose conditions are unlikely to be repeated next year.

Brenna Aegerter, Farm Advisor, Vegetable Crops



Figure 1. Bractscale in flower; a host of beet leafhopper which vectors curly top virus.



Figure 2. Bractscale is common on south Delta roadsides, ditch sides and levees



## **Calendar of Events**

### **Rice Field Day**

August 28, 2013, 7:30am to 12:15pm

Rice Experiment Station, Biggs, CA

Program will be available from

<http://www.plantsciences.ucdavis.edu/ricestation/>.

### **Alfalfa and Forage Meeting**

September 5, 2013

Kearney Agricultural Center, Parlier, CATram leaves for the field promptly at 7:50am, so don't be late!

Program will be available from <http://cetulare.ucanr.edu/Agriculture782/Agriculture/ALFALFA/>.

### **Western Alfalfa and Forage Symposium**

December 11-13, 2013

Peppermill Hotel Casino in Reno, NV

Program and Registration are available from

<http://ucanr.edu/sites/Alfalfa/>

## **Bacterial Spot on Almond Found in the San Joaquin Valley**

We have visited and received samples from orchards in Merced, Stanislaus, and San Joaquin Counties that have been showing symptoms of amber-colored gum exuding from almonds. The damage has been predominantly on the variety 'Fritz,' but reports are coming in of similar damage on 'Monterey', 'Padre', and 'Nonpareil'. Over the past few years, we have observed these symptoms at about the same time in mid-April to early May. The damage looked similar to leaffooted bug (LFB, *Leptoglossus clypealis*) or anthracnose symptoms. Concern was raised when orchards containing 'Fritz' which had been sprayed proactively three times for LFB or anthracnose repeatedly experienced the same symptoms. Symptomatic nuts were sampled and submitted concurrently to Dr. James E. Adaskaveg, Professor of Plant Pathology, UC Riverside, and Dr. Themis J. Michailides, UC Davis Plant Pathologist stationed at the Kearney Research and Extension Center. Drs. Adaskaveg and Michailides isolated consistently *Xanthomonas arboricola* pv. *pruni* from these infected tissues and both have positively identified the pathogen using mo-

lecular methods. Dr. Michailides being assisted by Dr. Jianchi Chen, a USDA Plant Bacteriologist located in Parlier.

*Xanthomonas arboricola* pv. *pruni* is a plant pathogenic bacterium capable of causing the disease 'bacterial spot' of *Prunus* species such as almond and stone fruit. We will have to verify that this pathogen is in fact causing these symptoms using procedures known as Koch's postulates, which involves inoculating symptomless plants and reproducing symptoms and re-isolating the pathogen, but the evidence looks pretty convincing. Drs. Adaskaveg and Michailides are currently conducting Koch's postulates. Dr. Michailides isolated *Xanthomonas* spp. from almond leaves and fruit showing similar symptoms in 2006 from samples provided by John Edstrom in Colusa County. This finding was published in a UC Cooperative Extension Newsletter from Colusa County in 2006. Koch's postulates were not performed at this time. Symptoms of infected nuts include the production of amber-colored gum from spots on the hull (Figure 1). Cutting into the hull, there is no presence of LFB feeding, but



Figure 1. Amber gum from hull spots

there is a lesion about the size of a pencil eraser (Figure 2). Lesions may enlarge, become sunken and orange in color, or exude an orange slime similar to signs of anthracnose. Leaves may show spots, turn yellow, and drop prematurely. Twigs may show visible lesions or cankers, similar in appearance to scab, which may be a source of overwintering inoculum. Infected nuts may stick on spurs and be found in close proximity to mummy nuts from the previous year, still showing dried up lesions.

Bacterial spot caused by *Xanthomonas arboricola* pv. *pruni* is a common problem in stone fruit and almonds throughout Europe, the Middle East, Australia, and the Southeastern United States. This disease can be very damaging, with the severity of infection depending on rainfall, dew formation, and warm temperatures. Fruit

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Figure 2. Hull lesions associated with bacterial spot

and foliage are both susceptible to infection in humid regions, areas with regular late spring rains with warming temperatures, or in orchards where foliage is routinely wetted from irrigation. Another bacterial disease of almond that occurs on leaves, flowers, and fruit is known as bacterial blast (*Pseudomonas syringae*) and it generally occurs under wet and cold temperatures that occur in early spring. In Australia, many growers have been forced to abandon, Fritz and Neplus Ultra, due to extensive crop loss to bacterial spot. Mission and Monterey were also shown to be susceptible in Australia while Nonpareil and Price were considered intermediate in their susceptibility. In Australia, infected nuts develop corky lesions that ooze orange colored gum that either drop prematurely or remain on trees after harvest as stick-tights. Circular or angular reddish lesions develop on leaf blades. Leaf spots may be discrete or may coalesce along margins and result in a tattered appearance (these symptoms are easily confused with shot hole but lesion size is slightly smaller). In Australia, defoliation follows and persists throughout the rainy period.

Management for bacterial spot will be much different than controlling LFB or anthracnose. It may involve trying to reduce inoculum levels by defoliating leaves with zinc sulfate in the fall, destroying mummies, and spraying fall, dormant, delayed dormant, and in season copper treatments to reduce overwintering inoculum. Intensive spray programs with copper and mancozeb have not controlled bacterial spot “down under” while in the southeastern United States peach growers have applied copper plus the antibiotic oxytetracycline as preventative fall sprays with some success. Unfortunately, bacterial diseases are very difficult to control. Still, several materials such as mancozeb and new formulations of copper that do not cause plant injury are already registered on almonds and may provide some level of control under California conditions. Furthermore, new materials have been identified against *Xanthomonas* diseases on other crops that possibly may be registered on almonds. We have no evidence to date that leafhoppered bug vectors this pathogen, but it is

a concern that we will consider for future research.

Brent Holtz, Pomology Advisor and County Director

## Possible Reasons for Heavy June Walnut Drop

There was considerable nut drop in some walnut orchards in June, particularly in the varieties Howard and Vina, though not limited to these varieties. At this point, it appears there are two separate causes for the drop, though it occurred at about the same time in affected orchards.

Heavy drop of Howards has been observed sporadically in past years. This year, Sacramento Valley orchards saw extremely heavy drop in many, though not all, orchards. Observations suggest that the drop here in the northern San Joaquin Valley was not as widespread or heavy. The cause of this drop is unknown. Over the years, it has been variously attributed to “internal walnut blight,” sudden onset of high temperatures, and “inadequate” pollination and over-irrigation. Dropped nuts do have brown-to-black watery internal damage reminiscent of blight, but lack any external lesions or other signs of blight infection. Extensive sampling and testing conducted over the past two years has now ruled out walnut blight as the cause. While there is some circumstantial connection between sudden and extreme high daily temperatures in May and this drop, this connection remains speculative and may just be coincidental. There is even less direct evidence that over-irrigation is related to the drop. To date, all research on walnut pollination (or lack of it) has shown that un-pollinated flowers drop within the first six weeks after bloom. There is no evidence to support the notion that unpollinated or “incompletely pollinated” flowers can grow to large size with well-developed hulls, shells, and kernels, and then abort. Until controlled experiments are conducted to conclusively link one or more of these causes to mid-season nut drop, uncover the mechanism by which they act, and test and validate measures that reduce it, they remain speculative.

Some blocks of Vina and other early and mid-leaving varieties saw extremely heavy drop in June due to walnut blight. This was surprising in light of the unusually dry spring weather and – in many cases, at least – a ramping up of blight control measures by many growers following on last year’s heavy late-season losses to this disease. As discussed in this newsletter last year ([cesanjoaquin.ucanr.edu/news\\_986/Field\\_Notes\\_Newsletter/?newsitem=44042](https://cesanjoaquin.ucanr.edu/news_986/Field_Notes_Newsletter/?newsitem=44042)), possible reasons for this year’s failures – and things to consider improving in future years – include:

**Not starting a blight control spray program early enough.** In most of the orchards with heavy infections I

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visited this summer, most of the dropped nuts were infected at the blossom end, suggesting that the original infections occurred very early in the season. While it seems strange that infections that may have occurred as early as April did not result in drop until June, it is at least conceivable that the cool weather we experienced in April and May could have slowed the growth and internal spread of blight bacteria from the pistil to the embryo and other internal tissues. Sizeable northern San Joaquin rain events occurred March 30-31 and April 4-7. It is possible that blight sprays applied well in advance of these events, or after them, may have left a window of vulnerability that over-wintering bacteria were able to capitalize upon – allowing for rapid population increases and heavy early season infections. The remedy: begin an effective protective spray program at early female bud-break (the so-called “prayer” of shoot development). In orchards with a history of heavy blight the prior season, research has shown that protective copper + mancozeb (Manzate) + penetrating surfactant treatments applied before bud-break can effectively reduce the number of blight bacteria overwintering inside buds and – in some trials – reduce disease incidence the following spring.

**Copper-tolerant blight bacteria strains.** In samples I collected from nine heavily blight-affected orchards this year, copper resistance was present in about one-third of

the isolates tested. This is consistent with previous results from northern San Joaquin Valley orchards. The addition of mancozeb improves copper efficacy by reducing the ability of bacterial cells to “pump out” toxic copper ions. Thus, for best results copper + mancozeb mixtures should be the foundation of an effective blight control program for our area. Until this year, isolates collected from orchards around the state all showed a high degree of sensitivity to copper + mancozeb mixtures. In tests this summer, however, it appears that some blight bacteria populations may have begun developing some degree of tolerance to copper + mancozeb. This is a disturbing development, and may have helped contribute– along with other spray program shortcomings – to some of the increase in disease incidence observed this year. Follow-up research on this new development is underway.

Any failure in pest or disease control should prompt a grower to question whether spray practices and conditions affecting spray coverage are being optimized, including travel speed, sprayer calibration, wind conditions at the time of spraying, and vertical reach of the sprayer. Alternate row sprays are not as effective as full orchard sprays, even when growers manage to get back within a few days to treat the other rows, and likely leave many flowers/nuts with less-than-optimal copper residues.

Joe Grant, Farm Advisor

## Evaluating Kernel Processing During Harvest

Since starch content is a major parameter used to decide which corn variety to plant, I'll describe a fast, yet effective way to evaluate kernel processing during harvest. Kernel processing breaks up corn kernels, allowing the starch to be digested. If whole kernels pass through the animal, the starch is lost in feces rather than used for milk production. By evaluating kernel processing at the time of harvest, adjustments can be made to ensure kernel processing is effective.



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- 1) Items needed: 5-gallon bucket filled with water and your silage sample.
- 2) Add silage sample to the water bucket.
- 3) Mix for several seconds.
- 4) Let the contents of the bucket settle.
- 5) Carefully pour off the water and larger material.
- 6) Kernels (and other dense material) will be at the bottom of the bucket; ensure the majority of kernels are broken/crushed.

Jennifer Heguy, Dairy Advisor, Stanislaus & San Joaquin Counties

## PCAs & consultants for grapes & almonds



Wood-Canker Disease  
Management Survey



Greetings from UC Davis,

We are writing to ask for your participation in a survey of PCAs, consultants, and other agricultural advisors investigating wood-canker disease management in grape, pistachio, and almond. We hope to learn about the practices that agricultural advisors recommend for preventing and managing wood-canker diseases. This survey is part of a broader research project, funded by the USDA, and involving USDA researchers, UCCE farm advisors, and faculty researchers from UC and other institutions.

Your participation in this survey is extremely important to obtaining representative responses from all types of agricultural advisors and regions of California. Your responses will help researchers and extension agents more effectively target future research, education, and extension efforts. You may also find this survey interesting and useful in thinking about your own disease-management decisions.

We greatly appreciate your time in answering this survey. As a small token of appreciation, if you complete the survey, you will be entered in a drawing for one of 10 \$100 Amazon gift certificates.

You may have previously received a similar announcement for this survey from UC Davis, CAPCA or another of your contacts. If you have already completed the survey, thank you very much for your participation and please disregard this announcement.

Please participate in the survey by clicking on the following link: [UC Davis PCA Wood-Canker Disease Management Survey](https://ucdavispolysci.qualtrics.com/SE/?SID=SV_4O8cHCeoSUi8Z7f)

You can also participate by copying and pasting this URL into your web browser: [https://ucdavispolysci.qualtrics.com/SE/?SID=SV\\_4O8cHCeoSUi8Z7f](https://ucdavispolysci.qualtrics.com/SE/?SID=SV_4O8cHCeoSUi8Z7f)

If you have any questions or concerns, please do not hesitate to contact our research team.

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# Conservation Tillage Dairy Bus Tours

Strip tillage has been adopted by dairy farmers on thousands of acres in the Central Valley. Come learn about how this system can help you maintain yields, reduce water consumption, and save money. Bus tours will share farmers' experiences in different counties on the days listed below.

**Merced County**  
**Wednesday, August 21st, 2013**  
**9:00 a.m. to 2:00 p.m.**

**12:30 p.m. Lunch and Program**

Bus will leave from and tour will end with lunch at:  
California Ag Solutions  
3451 Yeager Drive, Madera, CA 93637

**Kings County**  
**Thursday, August 22nd, 2013**  
**9:00 a.m. to 2:00 p.m.**

**12:30 p.m. Lunch and Program**

Bus will leave from and tour will end with lunch at:  
Giacomazzi Dairy  
9550 6th Avenue, Hanford, CA 93230

Additional information to follow upon RSVP. Please let us know by Wednesday, August 14th if you'll be able to join us for either or both days by responding to Ladi Asgill ([lasgill@suscon.org](mailto:lasgill@suscon.org), 209-576-7729) or Jeff Mitchell ([jpmitchell@ucdavis.edu](mailto:jpmitchell@ucdavis.edu), 559-646-6565).

*Strip-till equipment in action  
at Giacomazzi Dairy in Hanford, CA.*





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