COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

TREE AND VINE NOTES

AUGUST 2001

GLASSY WINGED SHARPSHOOTER AND PIERCES' DISEASE (Norton)
In Merced County my current recommendation for GWSS is total exclusion, and eradication if found. Make sure harvesters, gondolas, service trucks and winery trucks are pressure washed before you allow them on your ranch. You have the right to insist that all equipment is free of pests such as the GWSS, phylloxera and vine mealy bug. Any infestations of GWSS, no matter how small, should be treated immediately with a fast acting insecticide to prevent them from potentially transmitting PD to your vines. Contact your PCA for site-specific recommendations.

PUBLICATIONS AVAILABLE
There are several good publications with color photos available on the web. A couple are available at the Merced CE Office. In this newsletter I have included two articles written by Bill Peacock, Steve Vasquez and Jennifer Hasham about the identification and management of PD.

On the web go to: gwss.ucanr.org/
Publications and News
Look at the many publications listed. Most can be printed out on your color printer.

At the Merced office we have available:
Pierce's Disease – a 19-page color book on the disease and its identification.
Managing the glassy-winged sharpshooter in vineyards – 3 pages.

BLOSSOM THINNING TRIALS DISAPPOINTING SO FAR (Norton)
For the last few years, Roger Duncan and I have been experimenting with blossom thinning agents as a way to reduce hand-thinning costs in early peach varieties. So far the results have been frustrating. Despite more encouraging reports from the central and southern SJV, I have not been able to find the correct rate and timing for our varieties. My first three trials did not thin enough of the blossoms to reduce hand-thinning costs at all. This year's trials over-thinned resulting in reduced yields and split pits.

I have experimented with applying the plant growth regulator gibberellin in the summer to reduce return bloom the next year. I did get some reduction but not enough. I will try to put out some tests plots next summer. If you are interested in participating please let me know.

FALL FERTILIZATION—CHALLENGEING CONVENTIONAL WISDOM?

By Kevin R. Day, UCCE, Tulare County

Several years ago Ted DeJong and members of his lab performed an interesting experiment at UC Davis. In that study they used a mature block of O'Henry peaches to test the effects of nitrogen (N) fertilizer application timing on fruit performance. The trees were planted at a 6'X17' spacing and trained to the Kearney Perpendicular V conformation. Four treatments were imposed: 1) Fall N-200 pounds N/acre applied on September 28, 1993; 2) Spring N-200 pounds N/acre applied on April 9, 1994; 3) Split N-100 pounds N/acre applied on September 28, 1993, and 100 pounds N/acre applied on April 9, 1994; and 4) Unfertilized control that received no nitrogen during the 1993 and 1994 seasons. The nitrogen source was ammonium nitrate, and it was applied by hand in the micro-sprinkler pattern under the trees.

Prior to fertilizer in the fall, all trees had similar N status (table 1). Following the fall fertilization treatments those trees maintained or improved their leaf N concentration. By the following spring, all N treatments had similar leaf N concentrations while the unfertilized control was lower. This relationship extended into the harvest season. At harvest, fruit size and yield was the same for all fertilizer treatments (table 2). The unfertilized control trees had significantly smaller fruit and consequently a smaller yield as well. Harvest was advanced about 10 days in the unfertilized controls.

Potential Applications- The results presented in this paper are very interesting and somewhat unexpected when compared to conventional wisdom. Generally, it has been felt that in-season N applications have a greater potential to delay harvest than applications the following year. This research shows that it is the total amount of N applied that has the greatest affect on fruit development and tree performance-not the application timing. This means that we do not need to be as reluctant to apply in season fertilizer when trees need it. Unnecessary N application should of course be avoided. Remember that prior research has demonstrated many pitfalls associated with N over fertilization. The development of good fertilizer program should be based on plant resting and evaluation. In my opinion, the split N strategy – with about – to 2/3 of the anticipated tree N need applied in late summer – is still preferred since it allows for a finer degree of customization in the spring after fruit set and general tree condition is known.

Table 1. The effect of nitrogen fertilization on average leaf nitrogen concentration (%N) of fully exposed leaves during the experimental period.

N Treatment	9/27/93	10/22/93	4/21/94	5/19/94	7/22/94
No N	1.98	1.77c	2.83b	2.59b	2.42b
Spring N	2.02	1.82c	4.13a	3.64a	3.00a
Split N	2.01	2.00b	4.15a	3.54a	3.15a
Fall N	1.92	2.12a	4.11a	3.53a	3.20a
Significance	n.s	*	*	*	*

Table 2. The effect of nitrogen fertilization on crop load, average fruit size, fruit yield, and harvest date of O'Henry peaches in 1994.

N Treatment	Fruit/tree	Grams/fruit	Pounds/tree	Harvest Date
No N	223	143a	69.7a	August 2 a
Spring N	199	201b	88.2b	August 12b
Split N	218	193b	92.0b	August 13b
Fall N	214	191b	90.0b	August 11b
Significance	n.s.	*	*	*

Pierce's Disease

Identification in Tulare County Vineyards

Pierce's disease (PD) is a killer of grapevines caused by a bacterium, *Xylella fastidiosa*, which plugs the vines' water conducting tissue. Vines die within three to five years depending on variety; young vines die much more quickly t an mature ones. All commercial grape varieties are susceptible to PD, but Red Globe, Emperor, Calmeria, Fiesta, Barbera, and Chardonnay are particularly susceptible. This same bacterium also causes alfalfa dwarf disease and almond scorch disease. The PD bacterium infects a wide variety of other hosts, such as Bermuda grass, that show no symptoms but serve as reservoirs from which leafhopper vectors can transmit bacteria to grapevines. The leafhopper vectors active in the San Joaquin Valley are the green sharpshooter and redheaded sharpshooter. The glassy-winged sharpshooter is a much more efficient vector of PD and can spread the bacteria from vine to vine. With the introduction of the glassy-winged sharpshooter, early detection and removal of infected vines will be paramount in the management of PD.

Delayed Growth

Delayed shoot growth in the spring is the first indication the vine is diseased, and growth can be delayed by several weeks. With new infections, only shoots from a single cane or spur will show delayed growth; however, in the **final** stages of the disease almost all the shoots are delayed and much of the vine trunk is dead. Winter injury and poor wood maturity also cause delayed growth in the spring which can be confused with PD. However, delayed growth resulting from winter injury or poor wood maturity will show up in a large number of vines grouped in the vineyard. With PD, vines with delayed growth are scattered with a greater number nearest the source of bacteria Bermuda grass patches within the vineyard or an alfalfa field, pasture, or riparian area next to the vineyard.

Leaf Mottling

In the spring, diseased vines will usually have mottled leaves at the base of affected shoots. The mottling looks a little like zinc deficiency, and leaves are often deformed and smaller than healthy ones. Mottling increases with disease severity. Newly infected vines may only have mottling on shoots from an individual spur or cane. These vines will appear to recover, but more intense symptoms will appear by summer as the bacteria multiply and spread in the vine from the initial site of infection. Mottled leaves at the base of shoots often develop marginal bum by summer.

Leaf and Petiole Drying

As summer progresses, an increasing number of leaves will bum or scald and dry. Scalding begins as dry spots along the margin of the leaf, and these spots become necrotic and then

progressively enlarge, often leaving concentric zones of discolored and dead tissue. Leaves that have completely dried will fall from the vine leaving a green petiole still attached to the shoot or cane. Attached petioles will continue to dry from the tip down. Petioles that remained attached to the cane after leaf fall are diagnostic for PD.

Fruit, Canes and Roots

Flower clusters will shatter excessively on affected vines, and many clusters will dry after bloom, the number depending on the stage of the disease. At any time after early July, some or most of the fruit remaining on the vine may dry. The fruit of colored varieties often develops color prematurely. The woody portions of canes, spurs, and @ appear dry when cut with a knife, especially on chronically infected vines. The bark on one-year-old canes matures irregularly and shows immature, green patches. The root system dies following the death of the top.

Pierce's Disease

Management in- Southern San Joaquin Valley Vineyards

Pierce's disease (PD) has been identified in vineyards throughout southern San Joaquin Valley. Significant vine loss has been limited to hot spots in Tulare and Fresno counties. PD can be successfully managed in vineyards located in hot spot areas. However, even well managed vineyards will have 1% to 5% of the vines missing in any given year. This reduces production potential and increases production cost. Strategies to manage PD include:

Avoid planting highly susceptible varieties in **hot spots.**
No Vitis vinifera variety is immune to PD, but some are more susceptible than others. Highly susceptible varieties grown in the San Joaquin Valley include Red Globe, Emperor, Calmeria, Fiesta, Barbera, Mission, and Chardonnay. Crimson Seedless appears to be moderately susceptible. The susceptibility of Thompson Seedless and Ruby Cabernet is relatively low. Susceptibility of newly released table, raisin, and wine varieties is unknown.

Remove dead and diseased vines and replace annually.
Do not defer vine replacement and allow islands of dead and diseased vine s to become established in the vineyard. Use layers to replace vines. Rootings take much longer to reestablish a productive vine and should be used only if layering is not possible. Survey the vineyard and mark diseased vines in October when PD symptoms are obvious.

Send a small crew ahead of the pruning crew.
Saw off and remove marked vines, plant layers, and prune mother vines so that newly planted layers are not mistakenly severed by someone not paying attention in the main pruning crew. After two or three years, several layers from mother vines to avoid losing a series of connected vines if one becomes infected with PD.

Early identification and vine removal are critical when glassy-winged sharpshooter (GWSS) is present.
GWSScan spread PD bacteria from vine to vine. Inspect vineyards within a week or two after bud break and mark vines with delayed growth, then revisit vines in mid-to-late April and examine for leaf mottling diagnostic for PD. Vines with questionable symptoms are reexamined in late June when the stress of hot weather will intensify symptoms. From late June to October, a sample of eight to ten leaves and petioles from symptomatic shoots is used for lab identification of the bacterium. It is during this time that foliage symptoms of PD are most apparent. Always remove vines immediately after PD has been positively identified. A list of labs that specialize in tissue testing for PD is available at your local Cooperative Extension office. Field test kits are being developed that will allow the grower to quickly make positive identification of suspected vines, and these kits should be available soon.

A clean or bare vineyard floor is best.
Keep vineyard floor and adjacent areas (if possible) free of plants that host the PD bacteria and/or encourage sharpshooter populations. Avoid cover crops, especially perennial grasses and those that could host PD bacterium. Control stands of bermuda or other grasses in the vineyard and around leaky standpipes, irrigation pots or risers, ditch banks, return basins, and buildings. Avoid, if possible, having alfalfa or permanent pasture near the vineyard.

Control glassy-winged sharpshooter.
When GWSS is present, populations should be kept as low as possible in the vineyard and surrounding areas. This will require insecticide treatments and may require a regional approach. The University of California and the United States Department of Agriculture developed guidelines for *Managing* **the** *Glassywinged Sharpshooter- in vinevards.* This publication is available at www.ucr.edu/news/gwss or your local Cooperative Extension Office.

Branches and spurs begin to die and eventually the entire tree dies. Spore masses called basidiocarps form on infected branches. The only cure available at this time is to remove and bum infected trees.

Sun Exposure.....

Although the sun's rays are invisible, the damage that they can cause to your skin is severe.
Over exposure to the sun **is** responsible for sunburns, premature aging of theor skin and other types of damage such as skin cancer. Outdoor workers can be at a higher risk for skin cancer because of daily exposure to the sun's rays. These rays penetrate the skin, causing not only damage to the skin itself but they can also create eye damage, allergic reactions, and depressed immune systems.

PROTECT YOURSELF
Like they say in **Australia,**
"SLIP, SLOP AND SLAP"

Slip on a long sleeve shirt
Slop on some SPF 15+ sunscreen
Slap on a broad-brimmed hat

PREVENTION
The strongest weapon against skin cancer and the other negative effects of sun exposure is prevention. There are a number of preventive measures you can take to minimize the damage caused by the sun:
If possible, **avoid** the **sun between 10:00 A.M.** and **3:00 P.M.,** this is when the sun's ultraviolet rays are the strongest.
Wear protective clothing, such as a hat with at least a 3-inch brim and long sleeve shirts and pants of a tightly woven material.
Wear close fitting sunglasses to protect your eyes.

Use sunscreens with a sun protective factor (SPF) Of 15 or higher. Apply sunscreen liberally to any exposed part of your body. Remember to reapply your sunscreen frequently throughout the day to maintain its protective properties.

Don't be fooled by cloudy days. You can still get a sunburn because the sun's damaging rays can penetrate clouds and haze.

UV AND YOUR EYES
Ultraviolet rays can also cause damage to your eyes. There is evidence that the incidence of cataracts increases with sun exposure. In addition, sunburn of the cornea and growths on the surface of the eye may be related to sun exposure.

Sunglasses that block at least 99% of UV light offer some eye protection. You should not assume polarized or mirrored tenses offer UV protection unless they are specifically labeled as such.

DETECTION
Skin cancer is a potentially fatal disease. Therefore, preventive measures should be taken for protection from UV rays. One of the characteristics of skin cancers is that they can be treated and cured if detected early. Early detection and prompt treatment is imperative. Skin cancer can occur anywhere on your body, but is most often found on areas of the skin receiving the most exposure. Some of the most common areas where certain types of cancers tend to occur
Include the face and lips, the neck, back, arms and legs.

WARNING SIGNS of SKIN CANCER
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That you need to be aware of include:
Changes in the size or color of any moles or freckles on the skin

- Bumps that ooze, bleed or grow in size
- Sores that do not heat
- Skin that feels itchy, tender or painful

PRUNE ALMONDS SOON AFTER HARVEST (Hendricks)

There are two key reasons to prune as soon as possible after harvest is complete. First, early pruning will maximize your available **burn days**. Secondly, **silver leaf disease** infection and probably other diseases are minimized when pruning is done during dry weather.

Most pruning are pushed out of the orchard and burned, but tighter regulations with fewer burn days could mean more problems with burning in the future. Pruning promptly in the fall will give you more burn days before the winter fog sets into the valley.

But there are also alternatives to burning. We can shred pruning and return the residue to the soil, but this practice has its own problems. Large pieces of shredded wood can slow the harvesting and hulling processes. Wood fibers remaining in hulls used for cattle feed will raise fiber content, and cows won't eat wood. Dairymen don't want to buy wood waste with the hulls! Shredding can be successful if particles are small enough to blow out of the harvester, or if they decompose and move into the soil before harvest.

Who will shred the pruning, the grower or a commercial operator? The grower can use tractor-drawn shredders if fitted with the proper hammers and anvils rather than with cover crop knives. Several passes with these machines over properly sized and stacked pruning can do a good job of shredding. This is not an once-over operation. Shredding and flailing must be repeated until residues are small enough to decompose before harvest or blow out of the harvester.

Commercial operators are developing machines to grind the brush in one operation. But the machinery is expensive and is best suited to the commercial operator or to very large farms.

What can the grower do to make shredding more successful?

- Shred as soon as possible, within a day or two after pruning, while the pruning are still fresh.
- Grow legume cover crops to promote decomposition of the residue.
- Add compost or manure and cover crop residue on top of the shredded pruning.
- Irrigate frequently where possible to speed decomposition.
- Frequent flailing after cover crop seed is set in June will help pulverize wood residue.
- Keep the soil "healthy". Additions of compost, manure, cover crop clippings, and other organic material make the soil "hungry" for more! This is a long-term process, so start now while we still have options.

Silver leaf is a fungus disease that enters fresh pruning cuts during rains in mid-winter, so early fall pruning should help to avoid this disease. Silver leaf is still quite rare, but has been seen in a number of almond orchards in California. The fungus, Chondrostereum purpureum is a wood rotting fungus. The infection causes the leaves on infected branches to have a silvery look in early spring. This silvery appearance is caused by the epidermis of the leaf separating from the palisade layer of cells in the leaves.

Leaves appear small, narrow and have a nutrient deficient look. Nut set is very poor. Branches and spurs begin to die and eventually the entire tree dies. Spore masses called basidiocarps form on infected branches. The only cure available at this time is to remove and burn infected trees.

"FOOD SAFETY STARTS ON THE FARM" (Hendricks)

UCCE and the Almond Board of California have developed a new brochure entitled "FOOD SAFETY STARTS ON THE FARM". The Almond Board of California has sent this brochure to all California almond growers. This brochure addresses food safety and the prevention of bacterial contamination of almonds. I urge all almond growers to carefully read and heed the information in this publication.

If you do not have a copy, please contact our office. We have some copies for distribution.