



NEW WALNUT VARIETIES RELEASED BY UC DAVIS

The University of California Walnut Breeding Program recently released three new walnut varieties: 'Sexton', 'Gillet' and 'Forde'. Nursery availability of these new varieties is limited for 2007 plantings, but more will be available in 2008 and beyond. These varieties all have large light-colored kernels and high kernel yields. They have mid-season leafing dates (5-7 days earlier than Chandler). All harvest earlier than Chandler. To date, all three varieties have had low blight incidence in test plantings.

These new varieties hold promise for the future. If you plan to plant new acreage in 2008 or thereafter, you may wish to inquire of your nursery representative about trying them for yourself. We will have to wait many years to know for certain whether these varieties will live up to the potential they have shown in the breeding program's test plantings. Until we learn more, they should be considered promising but experimental. Several small replicated commercial plantings have been established in walnut districts to better evaluate their performance in commercial orchards. One of these is in the Linden area; so local growers will have as early an opportunity as anyone to see how they perform. The following descriptive information and observations on the new varieties were compiled by Dr. Gale McGranahan and Chuck Leslie of the Walnut Breeding Program at UC Davis.

'Sexton' came from a cross between Chandler and UC selection 85-8 (a Chinese introduction, used for yield, size and precocity) made in 1990. It has shown high yields on young trees and a harvest date around a week before 'Chandler'. 'Sexton' leafs out a week before 'Chandler'. It is 100% fruitful on laterals with abundant male and female flowers. Like most commercial varieties, 'Sexton' begins shedding pollen before pistillate bloom starts but its pollen shedding overlaps much of its own pistillate bloom. Potential pollenizers are 'Howard', 'Tulare' and 'Chandler'. The nuts are relatively smooth and round with good seals and good strength. The kernels are light colored, easy to remove from the shell and at 8-9 grams make up more than 50% of the nut weight. 'Sexton' trees tend to have many neck buds, a

densely branching canopy, and weeping growth habit. As such it will require careful training and pruning of young trees to prevent overbearing and establish good tree structure. It may be suitable for hedgerows where tree structure is less critical, heavy early yields is an objective, and limited tree size is an advantage. A second flowering can occur and may result in a few small nuts. Early and limited observations suggest that 'Sexton' may be difficult to graft.

'Gillet' originated from a cross made in 1995 between UC76-80 (for nut quality) and 'Chico'. It has high yields on young trees and a harvest date 10-20 days before 'Chandler'. 'Gillet' leafs out a week or more before 'Chandler'. Like 'Chico' and 'Forde', pistillate bloom begins before pollen shedding starts. It is 100% laterally fruitful and has had low blight incidence in test plantings. Potential pollenizers are 'Vina' and 'Sexton'. The nuts are somewhat more oblong than 'Sexton' with good seal and strength. Kernels are easy to remove, light-colored and, at 8.2 grams, make up over 50% of the nut weight. 'Gillet' is the most vigorous of the three new varieties.

'Forde' originated from a 1995 cross between UC61-25 (yield and size) and 'Chico' (for yield). 'Forde' has high yields on young trees and a harvest date that averages 5 days before Chandler. 'Forde' leafs out about 5 days before 'Chandler' and is 100% laterally fruitful. Potential pollenizers are 'Vina' and 'Sexton'. The nuts are oval to round and medium textured with good seal and shell strength. The large kernels (9 gram) are light and extra light and make up about 54% of the total nut weight. The tree vigor of 'Forde' is intermediate between 'Sexton' and 'Gillet'.

Joe Grant
Farm Advisor

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Tarweed Control

The spring's late rains brought our rangelands more than just extra grass. Pretty much everywhere you look there is an abundance of tarweed (spikeweed, *Hemizonia pumgens*) this year. This pesky native plant thrives with lots of moisture in the summer, sending its taproot deeper than annual grasses can go, giving it a competitive advantage. For those of you wanting to try and get rid of tarweed, there are a few things that can help, but as with any weed control, timing is everything.

If you are planning on mowing, the best time is to mow late in the summer. Late summer (August) mowing not only eliminates the plants now, but reduces the density of tarweed the following year. If you want to spray, you need to be out early. Using 2,4-D early in the spring (in April before the plant gets tall) works better than spraying later in the season.

Another way to control tarweed is to control the amount of soil moisture available. Increasing your forage base can use the soil moisture for the grasses that you want, and leave less for the summer annuals to use. Fertilizing with nitrogen in the fall can stimulate your winter annual grasses (soft chess, wild oats, etc.). This helps the grasses compete with tarweed. Planting clovers, vetch, or medics can also increase the available nitrogen in the system. Fertilizing them with single superphosphate may be a cheaper alternative to fertilizing with nitrogen.

One thing to keep in mind, as with most other weeds, the seedbank normally cannot be controlled within one year. So plan to continue your efforts for up to 5 years.

Theresa Becchetti
Farm Advisor- Stanislaus/San Joaquin

UPCOMING EVENTS

August 11 - Sept 4

California State Fair

Kids Day - every Tuesday

info: <http://www.bigfun.org/2005/index.asp>

August 14

Rootstock Identification Workshop

UC - Davis, Viticulture Field House

info: 530-757-8777

August 15

Winegrape Identification Workshop

UC - Davis, Viticulture Field House

info: 530-757-8777

August 24

Dry Bean Field Production Meeting, Agronomy Farm, UC Davis

8:30 to 12:00 noon

August 30

Rice Field Day, Rice Experiment Station, Biggs, CA 8:30 to 12:00 noon

September 9 & 10

California Dry Bean Festival

Tracy, CA

info: 209-835-2131

November 1 & 2

Aquatic Weed School

UC - Davis, campus

info: <http://wric.ucdavis.edu/> or e-mail

Gale Perez at gperez@ucdavis.edu

Crops Digest- Grapes & Almonds

Grapes

Summer arrived earlier this year compared to last after the 2006 season got off to a late and wet start in March. Bud break was about three weeks behind normal, but by mid May, bloom was only a week later than average. Then the hot, dry weather slowed things down and it appears veraison is about 10 to 12 days later than normal. Color is showing up in red varieties and the white varieties are beginning to soften, although both seem a little variable at this initial stage.

For many varieties such as Pinot grigio, Petite Sirah, Sauvignon blanc, Zinfandel, Colombard, even Chardonnay and the newcomer Pinot noir; demand is good and prices may improve slightly. The demand for Cabernet Sauvignon and Merlot is still a concern. The crop on a per acre basis appears to be about average to slightly below the long term average with many vineyards taking a break this year after a huge crop last year.

June was dry and warm compared to 2005; about normal if there is such a thing. A brief hot spell opened the door for the current July heat wave, which, after 10 days has broken a record of consecutive days over 100 degrees. However, it seems a lot of people have forgotten about 1981 when that summer had 25 days of 100 degrees or higher and 1984 with 30 days!

The hot weather demands do require more irrigation, even under a regulated deficit irrigation strategy. Besides the costs of pumping, we could see some crop loss to sunburn or water stress and summer bunch rot can become a concern, especially in Zinfandel. Unfortunately, not a lot can be done to prevent summer bunch rot other than managing irrigation on a fine line between providing enough water to keep the vines from being excessively stressed and too much water that might cause tight clusters and thin berry skins. The bottom line is moderate vine stress and water inputs.

Even though the extremely hot temperatures are slowing the vines down, harvest may be only a week or ten days behind average, especially with the generally smaller crop. There have been a lot of yellow basal leaves with this recent hot spell. That may have been hard to avoid unless your vineyard is located on deep soil and/or you started increasing water ahead of the heat spike. Even at that it may have taken some luck this year to avoid some early leaf senescence of basal leaves from water stress. Vines will tolerate some leaf loss, up to 20%, if a full and healthy canopy is in place to begin with. Insect pests and spider mite pressure appears to be average or light, but there have been a few problems from powdery mildew before the hot weather. Vine Mealy bug is still spreading through the county, so it is good to be aware of any new infestations, often indicated by sooty 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 begin looking before harvest are where birds tend to roost.

There has been increased concern about herbicide resistant Horseweed (or Mare's Tail) and Hairy fleabane, but two pests that seem to be taking advantage of more interest in biodiversity, are puncturevine and star thistle. Puncturevine has a good natural control in two species of puncturevine weevil (*Microlarinus* spp.), one that attacks the seed and one the stem. But weevil populations have plummeted over the past few years because of successful eradication of puncturevine. This year I am seeing many roadsides, untended areas and headlands with solid stands of this weed. There are some organic sellers of the puncturevine weevils, but they may be sold out. At this point if you are interested in buying a batch of weevils for augmentation you may have to surf the web. The weevils are present in many areas at low numbers. If there is a patch of puncturevine that doesn't get traveled through, letting bio-control work may help. But if there is any possible traffic through an infested area, herbicide is needed to prevent further spread.

With more habitat areas and native or natural landscapes, less use of residual herbicides and more tolerance for weeds, it is more important than ever to monitor and to control some of the more noxious and troublesome weeds before they seed. Star thistle is also more of a growing problem along roadsides, but it requires attention or it will dominate mowed areas, row middles and habitats.

Almonds

Hull split is progressing and harvest is not far off. Although prices have fallen in recent months demand seems to be ahead of supply to help strengthen the market. Bloom started in early February and then the weather turned cold and wet in March. In spite of that, the Nonpareil crop looks good, as the bees took advantage of the break in the rains during February. The later blooming Mission types are lighter than normal, but the crop may be good enough to get by with some good prices. It looks like the increased acreage statewide may keep the harvest above one billion pounds again.

The hot weather is often a concern with mite problems, but fortunately there are several new miticides providing a choice in various modes of action, a long awaited situation to help manage resistance and at the same time reduce overall chemical use. Besides trying to avoid mite problems during these high temperatures, water demand by trees becomes high enough to irrigate more frequently if possible. The deep soil moisture is good this year from the above average rainfall and may help make the effort easier to minimize excessive stress and related mite problems.

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Increased prices for pollination bees and higher pumping costs have ensured that the crop for the 2006 harvest will be more expensive. Because of that if you are using wells as an irrigation source, it may help to run a well water analysis for nitrate nitrogen to see if you can cut back on fertilizer. That may help increase nitrogen efficiency and reduce environmental impacts.

As mentioned above, some weed pests are making a comeback, such as puncture vine, horseweed or mare's tail, and hairy fleabane. We have more new materials to select from, but the best way to slow down resistance is to identify your pest (weed) and use the appropriate herbicides, before noxious or problem weeds can form seed.

Lower Limb Dieback on some varieties, such as Padre, has popped up again, but not as severe this year as the last two. The problem does seem to be associated with a species of *Phomopsis* and/or *Botryosphaeria*, but a clear understanding and control strategies are still elusive. In general crop maturity seems to be catching up with long term averages, although we are still behind "normal". So it appears harvest may be only slightly delayed.

As of July 23rd (10 days later than 2005) the Nonpareil at San Joaquin Delta College Variety trial was at 1% hull split. Whether normal or slightly delayed, it is important to monitor for ant problems and pick up quickly after harvest. The last few years have seen increasing ant problems, but some alternative bait materials are available that can help in choosing a good course of action.

Good luck with harvest.

Paul Verdegaal
Farm Advisor

“ There seem to be but three ways for a nation to acquire wealth...The third is by agriculture, the only honest way, wherein man receives a real increase of the seed thrown into the ground, in a kind of continual miracle, wrought by the hand of God in his favor, as reward for his innocent life and his virtuous industry.”

--Benjamin Franklin

Puncturevine Biology



Puncturevine is a low-growing annual. The plant produces numerous stems, up to six feet long, which are highly

branched and arise from the crown to produce a dense mat. The leaves are opposite, have short petioles, one to three inches long, oblong, pubescent, and divided into pinnate leaflets; each leaflet is about 1/4 inch long. It produces small, yellow flowers from July through October, and seeds contained in hard, spiny burs follow soon after.

Puncturevine is adapted to warm temperate conditions. It requires relatively high temperatures for germination and growth and is highly adaptable to a wide range of conditions. It prefers light-textured soils, but will grow on almost any type of soil, as is evidenced by it being found in pastures, roadsides, orchards, vineyards, waste places, parks, railway yards, and agricultural areas.

The plant derives its name from its burs that can penetrate bike tires, skin and even the sidewalls of car tires. The burs are also harmful to livestock, objectionable in hay and reduce the quality of wool fleece. Puncturevine is a C list noxious weed as designated by CDFA. A native of southern Europe, it was introduced

into the United States with livestock imported from the Mediterranean region. It has spread extensively throughout the southern, central and western United States since then.

It has been successfully controlled in the past with *Microlarinus lareynii*, a seed weevil, which was released as a bio-control by CDFA until the puncturevine control program was cancelled in 1997.



Debra A. Boelk, SRA II

Lygus - a Major Pest of Beans

The bean industry in San Joaquin County now grows principally Lima varieties with a scattering of Blackeye, kidney, and various heirloom beans. The western tarnished plant bug or, as it is more commonly called, the Lygus bug (*Lygus hesperus*), is a serious pest of beans. This insect is extremely mobile, feeds on numerous crops, can move into fields rapidly in high numbers, is difficult to kill with many insecticides and, moreover, can develop resistance to insecticides. Lygus bugs feed on flower buds, reducing yields. Later in the season, Lygus bugs sting the tender bean pods causing damage to developing seeds. Sting damage is more noticeable on light colored varieties such as Lima and Blackeye, making management more important.

Scouting for Lygus is done by walking fields at least twice a week and using a sweep net to determine Lygus numbers. Sweeping the plants should be *done in the morning hours between 8 am-12 noon*. Hot afternoon

temperatures cause Lygus to move into the shady interior of the plant making sweeps less reliable. Use 10 sweeps at a time covering a 180° (right to left) swath across the top of the plant. Do this in several locations of the field especially areas adjacent to alfalfa, safflower or grass fields. These crops are also lygus hosts and can harbor large populations until harvested or mature, at which time Lygus migrate into bean fields.

Treating for Lygus should begin when populations reach 1 Lygus per one 180° sweep for Lima beans beginning at early bloom. Our research trials showed increased yields in 2 of 3 years on the Luna bush variety when Lygus were controlled during bloom to early pod set. Vine varieties are even more vulnerable to Lygus over a longer period of time.

Insecticide efficacy research for three years has evaluated new and

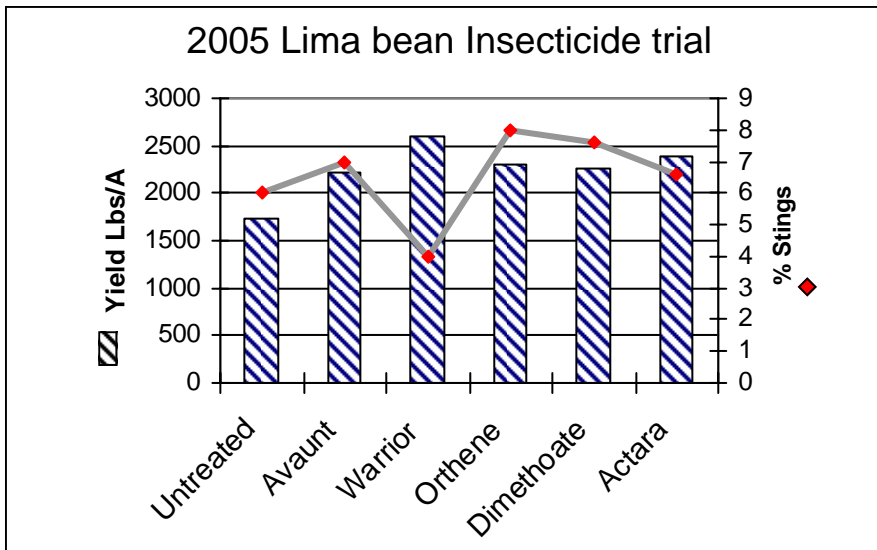


Figure 1. Yield response when various insecticides were compared for Lygus control in Luna variety lima beans.

registered products for management. New chemistries are in the pipeline and others are being registered. To date, the Pyrethroid insecticides (Warrior®, Mustang Max®) have been effective in providing approximately 14 days of control (Figure 1). Dimethoate®, an organophosphate, continues to provide reasonably good control of Lygus and may be the product of choice when cowpea aphids are also present. Orthene®, once the standard for Lygus control, continues to have more restrictions placed upon it, making it difficult to use. Refer to the UCCE San Joaquin website <http://cesanjoaquin.ucdavis.edu/> under field crops section for more specifics on our Lygus bean research studies.

Varietal differences to Lygus until recently have not been well documented. Our Lygus studies comparing varieties, Luna, Henderson and Carri blanco have clearly demonstrated that the Luna variety consistently produces higher yields when Lygus populations were not controlled (Figure 2).

Mick Canevari
Farm Advisor

Lygus Impacts on Lima Varieties 2004

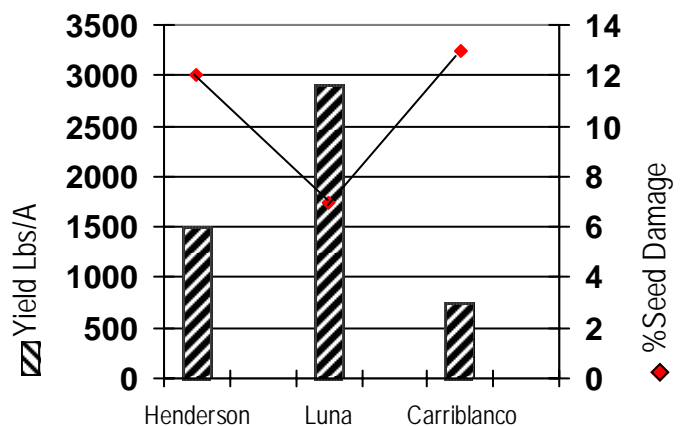


Figure 2. 2004 Lygus trials show untreated Lygus populations in Luna variety yield being 1300 lbs/acre higher than the untreated Henderson variety and 2100 lbs higher than the vine variety Carri blanco.

Dairy

According to a recent review of environmental effects on dairy cattle, economical losses due to heat stress in the US dairy industry are estimated at \$900 million per year (Collier et al., J. Dairy Sci. 2006[89]:1244). The article also includes an update of technical information on holding-pens, exit-lanes, and free-stalls cooling systems for dairy cattle.

Improving productivity in dairy animals exposed to adverse environmental conditions during the last quarter century has focused on improving the environment around animals, improving nutrition, and breeding for better milk yields rather than resistance to stress. This approach has dramatically increased productivity of dairy animals.

Today, the impact of cooling systems and facilities on heat stress is based on a combination of technologies including shades, sprinklers/misters, fans, and other evaporative cooling systems.

Shades for animals are considered essential to protect cows and to minimize losses in body weight gain, milk production, and reproductive efficiency. Regardless of climate, a mature cow requires 38 to 48 square feet of space beneath the shade. The shade must have a north-south orientation to allow penetration of sunlight beneath it for drying the ground. It is estimated that total heat load could be reduced from 30 to 50% with a well-designed shade, and animals can yield 10% more milk. Although shades reduce heat accumulation from solar radiation, there is no effect on air temperature or relative humidity; thus, additional cooling is required for lactating cows in a

hot, humid climate.

Early work concluded that using sprinklers in combination with supplemental airflow under shade housing was superior to a fan or sprinkling alone. Studies show that large droplets from a low pressure sprinkler system that completely wet the cow by soaking through the hair coat to the skin are more effective than a fine misting system. But, a combination of fans and misters was as effective as fans and sprinklers for reducing stress and improving milk yields. Fan/sprinkler systems used about 10-fold more water than fan/mister systems.

Evaporative cooling systems using high pressure, fine mist, and large volumes of air to evaporate moisture and cool the air surrounding the cows are very effective for improving the environment of lactating cows in arid environments. A high pressure mist system injected into low mounted fans (near the cow) can be very efficient and effective at providing a cool airstream over the cow.

Kansas State University researchers estimate that production increases of 5 to 10% achieved by cooling system installation provide an investment payback within 2 to 3 years; increasing yields by 20% reduces the payback period to one year or less.

Alejandro Castillo
Farm Advisor- Merced & Stanislaus Ctys

Tomato Spotted Wilt Virus

Incidence of Tomato Spotted Wilt Virus (TSWV) in tomatoes has been increasing, both in the southern San Joaquin Valley as well as in this area. While there have been "hot spots" of high disease incidence especially down south, the majority of fields have just a few infected plants.

Symptoms of TSWV are bronzing of leaves followed by the development of necrotic spots and streaks on the foliage and stems, which may be followed by shoot dieback. On fruit, characteristic ringspots develop. On red fruit these can be quite striking, but they are also faintly visible on green fruit. See photos of symptoms at: <http://ucipm.ucdavis.edu/PMG/r783102211.html>.

TSWV has an extremely wide host range, including hundreds of plants species spanning both broad-leaves and monocots (such as orchids and lilies). Economic hosts in California include tomato, pepper, beans, corn, lettuce, radicchio, celery and many ornamentals. There are many potential weed hosts, including nightshade, purslane, and pigweed.

This virus is vectored by at least 10 thrips species, including the western flower thrips (*Frankliniella occidentalis*) and the onion thrips (*Thrips tabaci*). After egg hatch on TSWV-infected plants, the first and second instar larvae acquire the virus. The virus reproduces within the thrips and they can then transmit the virus to healthy plants when they are adults. Adults cannot pick up the virus, nor can they pass the virus on to their offspring. Therefore, in order for a plant to be a source of the virus for new infections and spread, it must support reproduction of both the thrips and the virus.

In the past, we thought that there was no build-up or secondary spread within tomato fields because tomatoes did not support reproduction of thrips. However, observations this season of very heavily infected tomato fields adjacent to unaffected fields suggest that the vector and virus may be capable of building up within a tomato field. If this turns out to be the case, then controlling the thrips may prove beneficial in reducing the spread of the virus within a tomato field.

Because there are so many potential sources of inoculum (ornamental landscape plants, weeds, and other crops) and because their contribution to the problem may change from year to year, there is no clear strategy for positioning tomato crops to avoid infection.

Resistant varieties have been developed for both processing and fresh market varieties and these are currently being evaluated. Unfortunately, where resistance to TSWV has been introduced into other crops, the resistance has nearly always been overcome by the rapid occurrence of resistance-breaking strains of the virus.

The geographic distribution of the problem

(increasing as one moves southward in the Central Valley) may reflect the effect of winter temperatures on survival of the vectors. Colder winter temperatures may limit the over-wintering of the western flower thrips in the Sacramento Valley (its development does not progress at temperatures below 49°F). Alternatively (or perhaps additionally), higher disease incidence in the San Joaquin Valley might also be due to winter crops such as lettuce and radicchio which we know are hosts for the virus. The overlap of winter and summer host crops may provide a year-round habitat for the virus and its vector. But why has the disease been increasing during these past few years? Could it be because of the milder winters we've been having lately? This recent winter in Stockton, our average daily temperature in December was 5.6°F above the historical norm, while January was 3.4°F above. As shown in the table below, most winter months for the past few years have been milder than normal.

Plant pathologists from UC Davis are currently studying the outbreaks in tomatoes in conjunction with Cooperative Extension Farm Advisors. Your observations are of great interest to us and if you see a field with high incidence please call us. Hopefully we will soon have a better grasp on what factors increase the risk of significant infection.

AVERAGE DAILY TEMPERATURE (°F)		
	STOCKTON	FRESNO
Dec-05	50.9	51.0
Jan-06	49.4	48.7
Feb-06	51.3	52.4
Dec-04	47.2	46.5
Jan-05	46.3	47.4
Feb-05	53.1	54.4
Dec-03	48.4	49.3
Jan-04	46.0	46.5
Feb-04	49.7	50.5
NORMAL Feb	51.1	51.4
NORMAL Jan	46.0	46.0
NORMAL Dec	45.3	45.2

Brenna Aegerter
Farm Advisor



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Notes from the Field

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