

Got Mulch? *Using Mulch in the Landscape*

Anything used to cover the surface of the soil is called mulch. It may be inorganic, like rock or chipped rubber; it may be organic like straw, shredded leaves, chipped wood or bark. Mulch is often confused with compost, but while compost may be used as mulch, its primary use is as a soil amendment. Larger sized organic materials used for mulch, however, generally should not be dug into the soil.

Why mulch?

Much research has been done over the years to determine the effects of using different types of mulch. The following benefits of **organic** mulch have been repeatedly confirmed:

Less water is lost from the soil. With the surface covered, less evaporation happens, reducing your water needs slightly.

Soil temperatures fluctuate less. Soil stays cooler in summer and warmer in winter. This is a healthier environment for root growth and function, and fewer plants die from heat stress or frost damage. This is especially important for shallow-rooted plants.

Weeds are reduced. Excluding light reduces the number of weed seeds that sprout, and those that do are easier to remove.

Water infiltration increases. Covering the soil surface prevents the crusting that causes water to run off before infiltrating.

Soil and plant health is improved. Soil structure, nutrient levels, beneficial microbial activity, and other factors of soil health are all increased over time with the use of organic mulch.

Organic vs. Inorganic Mulches

Although inorganic mulch may have some of the same benefits as organic (reduced water loss and weeds), it does not add anything to the soil's health over time.

Rocks are appropriate for specific landscape situations, such as dry river beds, sections for succulents and other rock garden plants, or gravel for paths that allow water to infiltrate. Rocks absorb and hold a great deal of heat, and care should be taken to locate only heat-tolerant plants in or adjacent to rocks.

Rubber mulch application should be reserved for under jungle gyms where its greatest feature, shock-absorbency, can be of use. It adds nothing beneficial to the soil, and may release toxic heavy metals into the soil or runoff water, especially if the source of the rubber is recycled truck tires.

What's the best source?

The **North County Sanitary Landfill** contracts the recycling of all wood and greenwaste delivered to the site. A wide variety of high quality chipped and screened products is available for sale there at very reasonable prices. They are located at **17720 E. Harney Lane** in Lodi, and are open the same hours as the dump: Monday - Friday, 7-4; Saturday, 8-4.

The best source is the one you can afford that also meets your needs. Several landscape supply businesses around the county have variously sized products for sale by the cubic yard. Most deliver and waive the delivery fee for yardages over a certain minimum. Additionally, many tree service companies will dump their chipped load for the day on your property at no cost. Contact local companies directly to make arrangements for when they are in your area.

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What type and how deep?

Larger chunks stay put in windy areas and are perfect for large-scale landscapes and for under trees. The weight and size, however, can cause them to roll off steep slopes. With large shrubs and trees, a 3 to 4-inch layer should last about 3 years before needing to be topped off. Be sure to keep the mulch at least 3 to 12 inches from the base of the trunks to prevent rot.

The shredded “gorilla-hair” type product weaves together and holds best on slopes. Smaller bark nuggets or chipped wood work nicely in beds with smaller or delicate plants like annuals or tender perennials. A 2 to 3-inch layer will provide benefits without smothering plants. Be aware that it will break down and need to be augmented about every other year. In very windy sites, it may also be prone to blowing away.

NEVER USE MULCH RIGHT NEXT TO THE STREET CURB. This is a violation of the state’s Water Efficient Landscape Ordinance: In heavy rains the mulch floats away, clogging storm drains and adding an excess of solid material if carried into the storm-water system.

USE BLACK-DYED MULCH ONLY IN SHADE. If used in sun, wood mulch which has been dyed black absorbs heat and actually **raises soil and surface temperatures** high enough to scorch plant leaves it contacts.

MULCH LARGE LANDSCAPE POTS AND PLANTERS. Though often overlooked, large landscape pots used in commercial developments for small trees, shrubs, topiary, or seasonal color, benefit greatly from the addition of a 1 to 2-inch layer of organic mulch. Water use is significantly reduced by covering the pot soil. It also hides drip heads and reduces losses from the occasional “shooting” dripper.

How much do I need?

There are on-line calculators that will tell you how many cubic yards you need depending on how deep you want the material. You can calculate it yourself easily if you know the area in sq. ft.:

$$\text{CUBIC YARDS} = (\text{Area in sq. ft.}) \times (\text{\#in. deep}) \div 324$$

Example: $(9' \times 25') \times (3" \text{ deep}) \div 324$
 $225 \times 3 \div 324 = 2 \text{ cubic yards}$

Karrie Reid, Environmental Horticulture Advisor

Tomato Spotted Wilt Field Risk Index and Thrips Projections

The California Tomato Research Institute has continued to fund a TSWV research project over multiple years to develop an integrated pest management (IPM) strategy for thrips and TSWV. The research team had been focusing on areas of Fresno and Merced counties, then adding sites in southern Sacramento Valley. This year, they have added sites in our area (San Joaquin Co., southern Sacramento Co., and eastern Contra Costa Co.) Processing tomato fields are being monitored for thrips populations beginning in late February, and also evaluating and testing weeds in the vicinity of the fields and monitoring the incidence of TSWV-infected tomatoes in the fields through the season.

A risk index for TSWV has been developed by the research team that is based on factors that have been identified as playing a role in disease development, e.g., planting date, surrounding crops as hosts or bridges for the virus, proximity to weedy fallow fields and site history. An updated prototype risk assessment calculator is available for trial purposes: http://ucanr.edu/sites/TSWVfieldriskindex/Field_Risk_Index/. There you can enter information for a particular field to see what degree of risk the prototype index will assign to that field. Completing this information will be helpful to the team as they further develop the risk index. The hope is that once this risk index is refined, it will be a useful piece of information to guide decisions about where to plant resistant varieties or where to focus thrips management programs. Of course variety decisions are not straightforward, and while it is likely that TSWV reduces yields and resistance is an effective management tool, the field performance of a variety, even under high disease pressure, depends on other factors that may not be related to TSWV resistance. Look for more on variety susceptibility in another article.

In an early-planted field, if the virus didn’t come into the field with infected transplants (which appears to be uncommon for commercially-grown processing tomato transplants), the surrounding vegetation is likely the host source. In other production areas, there have been instances where fall/winter “bridge crops” such as radicchio or fava beans have been identified as the source of infections in nearby tomatoes. In the northern San Joaquin Valley, we do not have obvious host crops that are present during the tomato-free period. So what about weeds? In surveys of weeds conducted in past years in Fresno, Merced and Yolo counties, the vast majority of tested weeds were found to be free of the virus. One exception was a fallow field in Fresno Co. found to have moderately high incidences of the virus in both sowthistle and prickly lettuce. However, this situation of finding a “smoking gun” tends to be the exception rather than the norm. However, one interesting finding in our local area this spring has been roughseed buttercup (*Ranunculus muricatus*) infected with TSWV. This spring, at several

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local fallow fields where tomatoes had historically had high TSWV levels, roughseed buttercup was found in adjacent orchards with virus symptoms (see photo) and upon testing were found to have high levels of the virus. Because this weed's life cycle is biennial (germinating with fall rains and then potentially surviving more than one year to flower and set seed the second spring), it can potentially serve as a bridge between our tomato crops. This weed is not common, but its distribution has been spreading over the years. It prefers wet areas, such as low spots or field ends where water might sit longer. Unfortunately, it is not easy to control and combinations of herbicides may be needed. Further observations and monitoring will be needed to determine how important roughseed buttercup might be as a host in this area.



Symptoms of *Tomato Spotted Wilt Virus* in roughseed buttercup

Recent research suggests that thrips emerging from soil are another potential source of TSWV inoculum early in the growing season, and this could explain how lone TSWV-infected plants can be found in the center of fields, far removed from potential plant hosts. For sure, the levels of thrips and TSWV are low early in the season and efforts to eliminate known bridge crops and weedy fallow fields (a place that both thrips and TSWV can be amplified) will benefit both early and late planted crops in terms of reduced thrips and virus pressure.

UCD Pathologist Neil McRoberts (working with Bob Gilbertson) has developed a model to predict thrips population development for several production areas including ours, see http://ucanr.edu/sites/TSWVfieldriskindex/Thrips_Population_Projections/.

This site will be updated regularly during the season with both predictions and field observations. You can subscribe to these blog posts by RSS or submitting your e-mail address to receive an e-mail whenever there is a new posting.

Fresno Advisor Tom Turini has also looked at a number of insecticide programs targeting the thrips vector of tomato spotted wilt. After several years of trials, he concludes that the following materials are most effective as foliar applications:

- Dimethoate 4EL (at 1 pint)
- Lannate SP (at 1 lb.)
- Radiant SC (at 6 fluid oz.)
- Beleaf 50 SG (at 2.8 oz.) combined with Mustang (at 4.3 fluid oz.)

In general, a good IPM program has a target threshold level of the insect vector as a 'trigger' to initiate a treatment. While this is relatively easier for insect pests, such thresholds are far more difficult to establish for insect-transmitted viruses where there is not a direct correlation between insect numbers and virus incidence. The threshold would ideally be developed by quantifying a collection of infectious thrips that results in economic crop damage, but such a program of detection is difficult to develop and execute.

Without thresholds, the strategy is to make the initial application when thrips population build-up is initially detected (with yellow sticky card traps or the predictive model indicates) and when TSWV is detected within the field or in fields in the general vicinity. Growers who are not certain whether the symptoms in their fields are TSWV should have samples tested, as other viruses can look similar and are not spread by thrips. Field test kits exist for rapid confirmation of TSWV; I can conduct testing for you or I can give you information on where to buy the test kits. Delaying the initiation of spraying until confirmed presence of thrips/TSWV will reduce unnecessary sprays. Once thrips and TSWV appear in the field, multiple repeat applications are likely needed depending on thrips pressure and TSWV incidence. Unfortunately, any insecticide program will provide only partial control at best. The most sensitive stages of plant growth are seedling-stage through the flower setting stage; spraying should cease well before early ripening stage since mature plants are less susceptible to yield loss. To reduce the risk of thrips resistance, rotate insecticide chemistries rather than repeatedly using the same material within the season.

In over 4 years of trials, Advisor Turini has consistently found the neonicotinoid insecticide Platinum was ineffective when applied through a drip irrigation system for TSWV management in tomatoes. Neonicotinoids have activity against other insect pests, but should not be relied upon for TSWV control.

Chuck Rivara of CTRI maintains an email list to send alerts about TSWV and thrips activity. Sign up for this free service at <http://www.tomatonet.org>.

Brenna Aegerter, Vegetable Crops
Farm Advisor

Medusahead on Rangelands

Medusahead has been invading our rangelands for years. The Natural Resource Conservation Service (NRCS) has photo documentation from the early 1980's with large stands of medusahead on the east side of the county. Medusahead can also be found in the Livermore area but until this spring I have never seen it on San Joaquin County's west side. It is a very invasive grass that can potentially reduce grazing capacity by at least 50%. Early detection and control can help eradicate it on a ranch. Here I summarize the research projects that my colleagues and I have conducted to date. We are continuing to research management practices that are cost-effective and practical with the hope that we can find a combination of practices that will work.

Controlled Burn. Fire is the best option for controlling medusahead. Since it is a late-season grass, our desirable grasses have already set seed and the seeds are on the surface of the ground, ready to germinate in the fall, while medusahead is still actively growing and green. A quick moving grass fire can control medusahead while not harming the seeds that have already dropped. Timing for a controlled burn typically should be early to mid May, after the desirable grasses have started to turn brown and drop seeds and while Medusahead is still green and has not dropped seeds. Obtaining burn permits may be difficult.

Targeted Grazing. Medusahead has a short window of opportunity where grazing can have an impact. Typically in our area that window falls from April 15th to May 1st and corresponds to the period in development just before seed heads emerge. After the seed heads emerge, livestock typically will not graze it. Management practices that can increase animal concentration in areas with high medusahead can all work. We have created small pastures where we can increase the stocking density to 0.8 AUM/acre (an AUM is a 1000 lb. animal for a month), effectively creating pressure so all plants are grazed equally. Using 125lb supplement tubs, we created localized concentration areas and saw an effect up to about a 50-yard radius out from the supplement tub. Using this method, the supplement tub would have to be moved from one patch of medusahead to the next to see large-scale results.

Herbicide. Since Roundup is non-selective, we used it at three different timing levels to find a combination where we can allow for the longest grazing period and still control medusahead. Our late spring (early April) timing accomplished this. Recently Milestone has been used early in the year to selectively control medusahead and broadleaves, especially yellow starthistle. Timing is early fall and the higher the rate of Milestone applied, the better control was found to be, with roughly 89% control at 14 oz./acre compared to 59% control at 7 oz./acre. The label states "Spot treatments may be applied at an equiva-

lent broadcast rate of up to 0.22 lb. acid equivalent (14 fl oz. of Milestone) per acre per annual growing season; however, not more than 50% of an acre may be treated at that rate." So in addition to the cost of treatment, the label does not allow more than small patches to be treated at this high rate annually.

Mechanical. Mowing is another option and will allow for a three week window of opportunity, a week longer than grazing. We had success mowing plots in the Dunnigan Hills area and saw a substantial decrease in medusahead along with an increase in filaree, rose clover and annual ryegrass, desirable forages. Before mowing consider the amount and size of rocks in the area.

Fertilizer. One of our more recent projects has been to look at how nitrogen fertilization can change forage composition. In a drought year, fertilization resulted in a roughly 50% decrease in medusahead while annual ryegrass and bur clover increased. This year, we have added to the project, with a fall and spring treatment timing as well as two different rates of nitrogen. Results are promising so far that we should see a decrease in medusahead in the spring-fertilized plots, regardless of rate. These plots are grazed, and the reduction is due in part to competition since more desirable forages are using up the soil moisture, and by attracting livestock to the fertilized area. We are analyzing the percent crude protein between all of the plots. Our thought is that the extra nitrogen is increasing the crude protein in all of the forages and making medusahead more palatable at the critical period of grazing, right before it develops a seed head.

If you have medusahead on your ranch, especially if you find a new infestation, it is important to try a management practice that can help you reduce it and hopefully eradicate it before it becomes well established.

Theresa Becchetti, Livestock and Natural Resources Advisor, Stanislaus and San Joaquin counties





Managing for Quality

Some farm managers spend their days frantically going from one crew to the next telling pickers not to pick certain fruit (or to be more careful with pruning, thinning, etc.). The crew members all agree to change their behavior while the supervisor is present, but by the time the manager makes the rounds through all the other crews and comes back, he has to start all over making it clear that he is not satisfied with the quality.

Contrast this to the manager who makes sure that each fruit bin or box is clearly marked with employees' numbers so at any time any bin or box may be inspected and the picker evaluated in terms of the quality of the work. And now add the fact that not every box is inspected, but only a few through a random sampling procedure. Through this approach, responsibility for quality is passed on to every crew worker. Even better, when there are clear rewards for excellent work and consequences for poor performance, crew leaders and supervisors do not seem to be fighting against the current.

Gregorio Billikopf, Labor Management Farm Advisor



Calendar of Events

Small Grains/Alfalfa Field Day

Wednesday, May 15, 2013

UC Davis Agronomy Field Headquarters, Davis

Small Grains Field Day is from 8:15 am - 12 pm

Free lunch sponsored by California Crop Improvement:

12pm-12:45pm

Alfalfa Field Day is from 12:45 pm - 4:15 pm

Directions: UC Davis Agronomy Field Headquarters,

Hutchison Road, Davis, CA

Take Hwy 113 near Davis to Hutchison Rd. Go west. Right at first rotary, left at second rotary, about 1/3 mile further down on the left.

4 CE hours (PCA credits) and 6 Certified Crop Advisor (CCA) hours

See: <http://alfalfa.ucdavis.edu> for a printable program.

Blueberry/Blackberry Field Day

Wednesday, May 22, 2013, 7:30 am - 3:00 pm (tour of local farms & packing facilities 3 to 6 pm)

UC Kearney Agricultural Research & Extension Center, 9240 South Riverbend Ave., Parlier

For more information, contact Karen, UCCE Tulare County, 559-685-3300

Flyer with agenda: <http://cemerced.ucanr.edu/files/165543.pdf>

Register on-line: <http://ucanr.edu/2013bbd>. Cost is \$25 per person if paid or postmarked on or before May 16 (includes lunch) and \$35 after May 16 (lunch not guaranteed if registering after 16th).

Russell Ranch Field Day

Tuesday, May 28, 2013 8 am - 1:30 pm

Russell Ranch Sustainable Agriculture Facility at UC Davis (<http://russellranch.ucdavis.edu/directions>)

Registration required at <http://registration.ucdavis.edu>.

\$10 for general registration, \$5 for students, free for farmers - 3.5 credits of CCA CEUs available

Questions? contact Emma Torbert:

eetorbert@ucdavis.edu

Announcements

Alfalfa & Forage News

News and information from UC Cooperative Extension about alfalfa and forage production.

Visit the UC blog for alfalfa growers! Receive weekly updates on what we're seeing in the field. Recent articles include information on aphid outbreaks and identification, hay fire prevention, and meeting announcements. Visit <http://ucanr.edu/blogs/Alfalfa/> to read the blog, and subscribe to the blog by entering your email address into the right column. By subscribing to the blog, you will receive an email notification when a new entry has been posted.

New edition of book by Labor Management Advisor

The third edition of *Mediación Interpersonal* (2013) is now available in Spanish. The author is Gregorio Billikopf of the University of California. This book includes chapters on communication skills, dealing with disagreement, and helping others resolve conflicts. The cost is \$25 and may be ordered by filling out this internet form: <http://tinyurl.com/yt6t>. For more information call Marie Harter, UCCE Stanislaus County, at 209-525-6800.

The ABC's of Forage Analysis: What are NSC and NFC?

You will often see the carbohydrate terms nonstructural carbohydrates (**NSC**) and nonfibrous carbohydrates (**NFC**) listed on your forage report, or they may be used as parameters for comparing forage seed varieties. Both NSC and NFC measure carbohydrates that are not 'structural', in other words, carbohydrates other than cellulose and hemicellulose (building blocks of the plant cell wall). There are key differences between NFC and NSC, and depending on your lab of choice, there might also be differences in how NSC and NFC are determined. For this reason, you should direct procedure-related questions to the lab you are working with, and use caution when comparing results from different labs.

Nonstructural carbohydrates (NSC)

- Sugars, starches, and organic acids
- Measured in the lab

Nonfibrous carbohydrates (NFC)

- Sugars, starches, organic acids, and pectin
- Not measured, but calculated by difference

The primary compounds making up the NSC fraction of plants are sugars, starches, and organic acids. Typically, NSC is measured by an enzymatic method. In contrast, NFC is not determined chemically, rather it is a calculated value based on other determined values of the forage. Basically, NFC is determined by difference, where: $NFC = 100 - (\%Neutral\ Detergent\ Fiber + \%Crude\ Protein + \%Fat + \%Ash)$. Similar to NSC, the NFC will contain sugars, starches, and organic acids, but NFC also contains pectin. Pectin is a carbohydrate that is part of the plant cell wall. This is an important difference and one reason why the % NFC and % NSC on your forage lab analysis report will typically not be the same.

Using the example report, NFC is calculated as:
 $100 - (41.69^* + 7.7 + 3.01 + 6.46) = 41.14$

* NDF must be first corrected for bound protein:
 $NDF (42.80) - NDF\ Protein (1.11) = 41.69^*$

In the example corn silage report, the NFC is 41.14% while the NSC is 34.56%. The corn silage also contains 33.86% starch (DM basis) and the starch makes up 82.30% of the NFC (not shown). Most plants have some amount of pectin in their cell walls, and some feedstuffs including citrus pulp and beet pulp are high in pectin. **In the rumen, pectin is highly digestible just like sugars, starches, and organic acids.** Because the constituents in both NSC and NFC are highly digestible, estimates of

NSC and NFC provide information on the energy content of the forage.

Other articles in the ABC's of Forage Analysis series:

The ABC's of Forage Analysis:

http://cestanislaus.ucanr.edu/newsletters/Dairy_Newsletter45011.pdf

The ABC's of Forage Analysis: Fiber & Digestibility:

http://cestanislaus.ucanr.edu/newsletters/Dairy_Newsletter46368.pdf

Chemistry Analysis Results	
Dry Matter	35.9
Moisture	64.1
Proteins	% DM
Crude Protein	7.7
NDF Protein (NDICP)	1.11
Fiber	% DM
ADF	29.19
NDF	42.80
Carbohydrates	% DM
Starch	33.86
Crude Fat	3.01
Energy and Index Calculations	% DM
TDN	68.02
NFC	41.14
NSC	34.56
Minerals	% DM
Ash	6.46

Jennifer Heguy, Dairy Advisor
 UCCE Stanislaus & San Joaquin Counties

Ed DePeters
 UC Davis, Dept. of Animal Science

Almond Mite Management in May

May is the time to decide on your approach to mite management. Many growers and PCAs prefer a preventative calendar program by applying a product in May (Agri-Mek or generic abamectin) and then following up with a second miticide at hull split with their navel orangeworm spray. The main disadvantage with this strategy is that two sprays are applied when one spray might have been sufficient, and a biological control program with predators never had a chance to succeed. Another approach is to base treatment decisions on pest density. The recommendation is to do presence/absence sampling and avoid spraying until about 50% of the leaves have mites present on them (in the case that beneficials are found) or until about 25% of the leaves have mites (if there are no beneficials). See

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the pest management guidelines for webspinning spider mites in almond at our UC IPM website (<http://www.ipm.ucdavis.edu/PMG/r3400211.html>). Following this IPM approach will often result in not needing to spray until the middle of June and hull split when one application of a product that can kill spider mites while preserving predatory insects (e.g. Envidor, Zeal or Fujimite), will usually be sufficient for the remainder of the season. Predatory mite releases should be made when mite infestations are relatively low, as they can't put out a "fire" and more than one application may be necessary. Narrow range oil sprays at 2 % may also help reduce mite infestations in combination with predatory mite release. Dust management and avoiding water stress are also important in mite management. Dust can be controlled by watering or oiling roads and by driving less than 10 mph. Water stress can be avoided by following proper irrigation recommendations and promoting practices that allow for good water infiltration. If soils have a tendency to surface seal or become compacted, the use of gypsum, light tillage, or a cover crop growing in the row middles may enhance water infiltration.

David Haviland, UCCE Farm Advisor in Kern County, recently wrote a nice article addressing the use of abamectin in almond to manage mites. "Managing mites in almond with abamectin" can be found at <http://thealmonddoctor.com>. When abamectin is applied properly, early in the season before leaves have hardened and with horticultural oil, good mite control can typically be achieved through hull split. But the availability of cheaper generic abamectin has resulted in cases where the product is used in less than ideal situations, such as later in the season after leaves have hardened, without horticultural oil (1% 415° summer oil) that improves absorption and efficacy, and with less than ideal water volume to allow for adequate coverage (100 -200 gal of H₂O / acre at drive speeds less than 2 miles per hour). Don't apply abamectin more than one time per season in order to avoid resistance from developing in mite populations. There are a number of excellent products that can be used in your mite arsenal, so don't rely on the repeated use of just one product with the same active ingredient.

Abamectin works primarily as a nerve toxin that mites ingest while feeding. Once ingested the toxin causes paralysis to juvenile and adult mites that eventually die through starvation. In order for abamectin to work properly it must be applied to the leaves and absorbed trans-laminarily, and then be expressed in plant tissues where the mites feed. This absorption process works best prior to leaf hardening when leaves are young, tender, and free from dust and other residues. Leaf hardening on mature trees typically occurs around the middle of June in the northern San Joaquin Valley, and later in the season on non-bearing trees. Growers that apply abamectin prior to leaf hardening, with oil, and at the right speed usually are successful controlling mites.

Some growers, particularly in the northern San Joaquin Valley, apply abamectin late in the season because abamectin is inexpensive and can still suppress mites through harvest. Unfortunately, applying abamectin near hull split will greatly reduce your predatory thrips populations that are helping to control spider mites. Also, growers that use abamectin at hull split probably also sprayed it in May. This is highly inadvisable from the standpoint of resistance management. A better integrated pest management approach would be to stick with traditional hull split miticides and/or 415° oil.

Brent Holtz, Pomology Farm Advisor and UCCE San Joaquin County Director

Delta Research Overview

With the growing season upon us, I thought this would be a good time to describe a few of the applied research projects being conducted this year in the Delta.

Evaluation of Surface Water Quality on Soil Leaching Fraction and Alfalfa Yield in the Delta

I introduced the background for this project in our February *Field Notes* newsletter. Soil salinity is a sporadic problem in the Delta in the short run, varying with surface water quality, depth and quality of the groundwater, and volume of winter rainfall. In the long run, however, salinity will challenge Delta farmers' ability to grow alfalfa, especially under conditions of reduced water flows or higher irrigation water salinity if the water quality standard is changed. This is because alfalfa is moderately sensitive to salinity. The purpose of this project is to determine the leaching requirement currently being achieved in Delta alfalfa fields. Since the February article, funding has been awarded, and the project is underway.

Field Corn Variety Trial

In 2012, nearly 100,000 acres of corn for grain and forage were planted in the Delta region, out of approximately 500,000 acres in agricultural production. Growers have emphasized the importance of a Delta variety trial because of the different growing conditions and disease pressures. Moreover, the UCCE trial compares varieties from several seed companies. Until this year, the trial was conducted by Kent Brittan (Yolo County farm advisor). I cooperated on the effort in 2012, and results are available at <http://ceyolo.ucanr.edu/files/157330.pdf>. With Kent's retirement last fall, I am leading the effort this year.

Evaluation of Irrigation Practices on Water Use, Soil Salinity, and Tomato Productivity in the Delta

This project is a collaborative effort with vegetable crops advisor, Brenna Aegerter. Through this project, we will evaluate the impact of conversion to drip irrigation on water use, soil salinity, tomato yields, and fruit quality in the Delta. This study will have particular sig-

nificance for Delta processing tomato growers who have not made the transition to drip irrigation as broadly as growers in other regions of the state. Results from this study will give growers knowledge on whether drip irrigation improves tomato yield and/or quality in the unique Delta growing environment and is, therefore, worth the investment.

Effects of Calcium Sprays and AVG on Fruit Quality at Harvest and After Storage

I am assisting Chuck Ingels (Sacramento County horticulture advisor) with this project. The purpose is to examine how different calcium foliar sprays and an ethylene biosynthesis inhibitor affect post-harvest fruit quality of pear. Higher fruit calcium has been linked with longer storage life. Additionally, inhibiting ethylene production may allow growers to leave fruit on the tree longer without harming fruit quality, which could be important in times of labor shortages. While pear acreage has been declining in recent years, historically and culturally, pear is an important Delta crop, and thus, this project serves in addressing the viability and sustainability of agriculture in the Delta.

In addition to these trials, other Delta-related projects include a field corn seed treatment study, rice variety and fertility evaluations, an environmental benefits program along the Mokelumne River, and a study of irrigation management strategies for improving water quality in alfalfa. Please feel free to contact me about these projects or other issues facing Delta agriculture.

Michelle Leinfelder-Miles, Farm Advisor, Delta Crops

Crop Digest: Grapes

The current 2013 season started off with Chardonnay budbreak just slightly behind average about three days, on March 18th. Warm daily maximums, but below average nightly lows allowed for a below average accumulation in growing degree days (GDD). Temperatures warmed up along with many windy days during the last 10 days of April. And as of May 1st, the GDD are well above the long-term average by about 40%. The result is many varieties are about 14 days ahead of average in bloom!

It appears as the end of rain season approaches we will finish with about 85% of average of total rainfall for the season. And even a wet May would not catch it up. What is different this year compared to last is that the early fall rains were heavy and very effective at recharging deep soil moisture this year. The top foot or so is dry, but deep moisture is still very good. Since mid-January, rain has been light to none, except for an Easter weekend storm that dropped about 1.4 inches of rain to make March close to average!

There was no frost this year, but April has been windy to a point of misery and frustration; in dust and application stoppage. Most days have been extremely dry with respect to morning dew; as minimum temperatures have not reached dew point. This may be one reason that very little powdery mildew has been seen in the Virtual Weather station project control plots (in Chardonnay!); despite the model indicating very high potential for disease development.

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Lodi Seasonal Rainfall (inches)

	Total	% of Avg	OctNovDec	Jan	Feb	Mar	Apr	May	Jun
2002	16.3	92	9.7	2.0	1.0	2.5	0.2	0.9	0
2003	15.2	86	8.7	0.6	4.7	1.1	0.1	0.1	0
2004	15.3	87	9.2	0.6	0.9	0.6	3.6	0.4	0
2005	23.1	131	10.4	3.2	3.3	3.5	1.4	1.3	0
2006	23.4	132	7.1	5.4	1.1	5.2	3.8	0.8	0
2007	12.1	68	4.6	0.3	4.3	0.6	2.3	T	0
2008	13.7	78	4.5	7.3	1.8	0.1	0	0	0
2009	15.1	85	4.0	1.9	5.3	1.9	0.7	1.3	0
2010	19.2	109	6.1	4.5	3.6	1.8	2.9	0.3	0
2011	26.3	149	12.1	1.4	4.1	5.8	0.2	1.4	1.3
2012	12.4	70	3.0	2.9	1.3	3.3	1.9	T	0
2013	15.5	89	11.0	1.2	0.3	2.1	0.5		
Average	17.8		7.5	2.6	2.6	2.4	1.5	0.7	0.1

(Continued from page 8)

There was some initial growth problems on young vines planted in the last four years. Several sites have shown delayed budbreak, erratic and non-uniform shoot growth, mostly in Pinot grigio and Pinot noir. The arrival of warm weather and some irrigation seem to have mitigated most problems. Dry mid-winter conditions and large crops in 2012 probably stressed most of these vines.

This spring, the 2013 situation provides growers with the opportunity to control shoot growth; but this year deep soil moisture is much better and vines may tolerate an early hot spell better than last year. But caution should be used with weaker vines, young vines and blocks expected to produce high yields. These sites should get a little extra water that might not be needed in most other blocks. Unless cover crop is present vines have only been using about 0.25 inches of water (or very “seat-of-the-pants”, about five hours worth of irrigation time) per week. During that same period orchards have been using about 0.75 inches of water. That can double soon and increase further whenever the weather does warm up. In a dry year like this it is a good idea to stay ahead instead of using deep soil moisture. Irrigate so as to maintain deep moisture available for mid to late summer and into harvest in the fall.

Gophers, voles, squirrels, rabbits and their nemesis coyotes have become very active at this point. Besides the double edged sword of coyotes, the benefit of owls, hawks and snakes (or cats), may still require control measures for the above pests; before they reproduce and litters begin to disperse. See the UCIPM guidelines for some ideas in the Home and Garden section (all that I could find):

Voies <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7439.html>

Gophers <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html>

Rabbits <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7447.html>

Squirrels http://ucanr.edu/sites/Ground_Squirrel_BMP/

Or on the wide range of vertebrate pests:

<http://www.ipm.ucdavis.edu/PMG/menu.vertebrate.html#VERTEBRATES>

A new leafhopper pest has been reported in California and in Lodi. The Virginia creeper Leafhopper (VCLH) seems to have moved down from the Northwest after arriving cross country from Virginia. It may be a problem, until beneficials can hopefully adapt and control it. Be on the lookout for an odd looking pattern of 4 distinct dots on the back of the VCLH. See <http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=9481>

Light brown apple moth (LBAM) is spreading in the Manteca and Tracy areas and unfortunately may begin to be seen near several of the landscape nursery operations around the county. Be on the lookout. It is controllable, as is the more traditional pest of omnivorous leafroller. LBAM does unfortunately require quarantine and more paperwork. For more information:

<http://www.ipm.ucdavis.edu/EXOTIC/lightbrownapplemoth.html>

The “new” problem appears to be identification and recognition of a virus associated with symptoms called Red Blotch Disease. As in the past, order from reputable nurseries, purchase certified virus-tested vines and/or know the history of any variety selections chosen. It has become apparent in so many locations across so many varieties and regions that debate and investigation continues on how it might be spread. See more information at <http://iv.ucdavis.edu/?uid=284&ds=351> and <http://iv.ucdavis.edu/files/157508.pdf>

There are big challenges for 2013, mostly in regulations, labor management, input costs and the Affordable Health Care Act. But wine sales are up, contracts offered for planting and a mini-boom of replanting old blocks or new site planting. Nursery production is tight, but may loosen soon. Consumers are looking for value and Lodi remains a good place to grow quality grapes for quality wine in a good, but competitive market.

Hopefully the season becomes known as lucky 2013.

Paul Verdegaal, Viticulture and Pomology Farm Advisor



Red blotch and red veins on a leaf of Cabernet Franc grapevine.



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