



## New IPM Advisor

My name is Jhalendra Rijal, and I am a recently hired IPM Advisor with UC Cooperative Extension (UCCE). My primary job responsibility is to provide leadership to promote Integrated Pest Management (IPM) through research, training and extension activities. Program-wise my responsibility is for the northern San Joaquin Valley (San Joaquin, Stanislaus, Merced counties) region, however, my office is at UCCE in Modesto. I am very excited about this opportunity to serve in this area, and look forward to working with growers, pest control advisors, chemical representatives, UCCE advisors, specialists, and other stakeholders in the near future.



I grew up with a farming background (in Nepal), thus, I am familiar with problems broadly associated with agriculture production systems faced by many farmers. I have an undergraduate degree in agriculture and a graduate degree in entomology. My Master's degree focused on exploring the potential of locally-isolated insect pathogenic fungi in biological control of tomato fruit borer in chickpea. My doctoral work at Virginia Tech focused on development of a pragmatic sampling plan for grape root borer, an economically important insect of vineyards in the eastern US. The other aspect of my work was finding out important risk factors associated with borer infestations in vineyards by which the degree of borer infestation can be measured reliably in the fields. I also studied food-finding behavior of larval grape root borer and this work was intended to develop a pest management strategy using the concept of attract-and-kill. Moreover, before my doctoral work at Virginia Tech, I worked as a Plant Protection Officer with the government of Nepal, where I was mainly responsible for disseminating pest management information, providing trainings to field technicians, pesticide handlers and growers, and conducting IPM farmer field schools.

After the completion of my PhD from Virginia Tech, I decided to move to California to see 'large-scale agriculture' and be a part of it. I joined Larry Godfrey's lab (Dr. Godfrey is a UCCE Entomology Specialist at UC Davis) as a postdoctoral scholar, and worked collaboratively with UCCE Advisors and growers from Tulelake to Salinas on two separate projects: 1) IPM of peppermint insect pests in northern California, 2) Bagrada bug biology and management in the Salinas Valley. The goals of these

projects were to understand the behavior and biology of the target pests and to find better and pragmatic pest management alternatives. Both of these projects were collaborative, and major project activities were conducted in growers' fields.

Within a month of my job here in the northern San Joaquin Valley, I have witnessed several insect pest management related issues, and I am committed to working on those and other similar issues in the near future. With your help and cooperation, I am confident that we can build a strong, collaborative IPM-focused applied research and extension program for several major crops in the region. I am hoping for your cooperation and help. If you have any questions or suggestions please feel free to contact me at [rrijal@ucanr.edu](mailto:rrijal@ucanr.edu) or 209-525-6800. I have also created a blog: <http://ipmsjvalley.wix.com/ipmsjvalley> (I will update this page from time to time).

Jhalendra Rijal, IPM Advisor, UCCE Merced, Stanislaus, and San Joaquin Counties

## Announcing the Agronomy Research & Information Center

The Agronomy Research and Information Center (Agronomy RIC) is a one-stop shop for finding UC agronomy information. The Agronomy RIC delivers scientific, research-based information on California agronomic crops. Recent funding from the UC Division of Agriculture and Natural Resources and the UC Davis Department of Plant Sciences allowed us to revamp the previous agronomy website, and it supports ongoing maintenance of the site, keeping information relevant and timely. The URL for the Agronomy RIC homepage is <http://agric.ucdavis.edu/>. On the next page, I describe the type of information that is available from the site.

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On the homepage, there is general information about agronomy in California and the history of agronomy at the University. There is also a calendar of upcoming meetings and field days. Under the News and Updates heading are articles from UC agronomy blogs, like the Alfalfa and Forage and Rice blogs. I described these blogs in a previous newsletter article ([http://cesanjoaquin.ucanr.edu/newsletters/Field\\_Notes\\_Newsletter50179.pdf](http://cesanjoaquin.ucanr.edu/newsletters/Field_Notes_Newsletter50179.pdf), page 5).

Links to crop-specific information are also available from the homepage. The alfalfa, beans, cotton, oil seeds, rice, small grains, and sorghum pages are up-to-date, and the biofuels, corn, and sugar beets pages are still under development. The crop pages provide production guidelines, research reports and presentations, and contact information for UC personnel working on those crops.

In the future, we hope to include more interactive tools on the website. An interactive tool allows growers to plug in their own field information, and the tool provides decision support. One tool that is currently available is a rice phosphorus (P) calculator ([http://rice.ucanr.edu/P\\_Budget\\_calculator/](http://rice.ucanr.edu/P_Budget_calculator/)). Growers can use this tool to help them determine whether P fertilizer is necessary, potentially saving them time and money. It does this by calculating the balance of P in the soil as the difference between what P is applied and what is taken away by the crop. Another tool that is under development is a degree day model that will estimate rice growth stages using current and historical California Irrigation Management Information System (CIMIS) weather data. This tool will help growers estimate when their crop will reach certain growth stages, and in turn, estimate when certain management practices – like raising water height, applying sprays, and draining – should occur.

I hope you will visit the Agronomy RIC, and I welcome your feedback on how the website could best suit your needs.

Michelle Leinfelder-Miles, Farm Advisor, Delta Crops

## Tomato Disease Observations This Season

**Powdery mildew.** As of late July, it is looking like a bad year for powdery mildew in tomatoes. I have heard that there is a rumor circulating that there is a new strain of powdery mildew that is resistant to sulfur. I believe this idea originated from a field visit I made where there was what appeared to be mildew damage on stems and petioles. Our typically-occurring mildew is caused by *Leveillula* which does not grow on stems/petioles, suggesting that the field may be affected by the less common (but not new) mildew caused by *Oidium*. In this instance, the

field had been treated with sulfur about one week prior to the symptoms becoming quite severe. However, it is possible that the mildew was already well established on/in the plant prior to treatment and thus was not well controlled by the dusting. There is no known resistance to sulfur in any pathogen; because sulfur has multiple modes of action the risk of resistance developing is extremely low. We do have evidence of some levels of resistance developing to some DMIs (e.g. Rally) and to strobilurin fungicides (e.g. Quadris, Cabrio, Flint); therefore, we do recommend that you not rely too heavily on these products alone. Using products in other groups (Quintec, Fontelis), formulated mixtures (Priaxor, Quadris Top) or tank mixes (e.g. adding wettable sulfur to a fungicide) are effective ways to help manage fungicide resistance.

**Curly top** incidence has not been as devastating this year as in 2013, but it does continue to be a widespread problem with a higher incidence than pre-2013, and is causing economic

losses in some locations in San Joaquin County. UC Davis researchers and farm advisors have been monitoring the populations of the beet leafhopper (BLH) vector with sweep nets and yellow sticky traps (this is in addition to the monitoring efforts of the State-run Curly Top Virus Control Program). While there was a peak in BLH counts in the county from mid-February through mid-April, BLH have continued to move through tomatoes periodically, transmitting the virus when they do. Mostly they are living on various weeds (but especially bractscale, aka saltbush or stinking orach, figure 1) and sometimes in other crops (e.g. alfalfa, etc.). When



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

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weeds (or alfalfa) are disturbed, as by mowing, disking, herbicide application, or just drying down, the hoppers move to find a new host. In the process of looking for a new host plant, they may move through tomato fields, and while they won't stay in tomatoes, they can still transmit the virus when they "taste" the tomatoes. Avoid disking weedy, fallow fields adjacent to tomato crops. Spray weeds along roadsides and ditches with an insecticide. The dense vegetation of drainage ditches is not thought to be suitable habitat for the hoppers, so don't worry about that vegetation as much as the weeds that are up on the top edge of the ditch and along the roadsides. If you need help with identification of BLH, please contact me. Photos of the various BLH life stages are online at: [http://www.cdfa.ca.gov/plant/ipc/curlytopvirus/ctv\\_hp.htm](http://www.cdfa.ca.gov/plant/ipc/curlytopvirus/ctv_hp.htm) and <http://www.ipm.ucdavis.edu/PMG/C/I/HO-CTEN-AD.001.html>. If hopper populations are high (~10 BLH per 10 sweeps) in weedy, fallow fields or roadsides, then the State CTVC program can do the spraying. However, very often our BLH levels in this county do not reach levels that high. Also, remember that the State program cannot spray cropland (e.g. orchard floors). A question we still are looking at is whether the hoppers are migrating out of the coastal foothills here (as is known to be the case down south in Merced to Kern counties) or whether they are overwintering on the valley floor. Our sticky traps located in crop areas of the valley did not catch hoppers during the winter, but the State program sweeping of the foothill rangelands near Tracy also did not detect hoppers in late winter/early spring. So the mystery of where our hopper populations are coming from remains unsolved for now. We did have some success with an insecticide treatment (DuPont's Verimark) applied as a drench to the tomato transplants at the greenhouse. This single application reduced curly top incidence (but did not control it completely) for over a month after planting. I'll share more about this trial in a future newsletter.

**Fusarium wilt and Verticillium wilt.** We are seeing higher incidences of both Fusarium and Verticillium wilt this year. These diseases are both caused by soil-borne fungi which result in plugging of plant xylem vessels. For Verticillium wilt ("Vert"), the early symptoms are dieback of the oldest leaves, with the terminal leaflet generally being the first to die. Sometimes the leaflet may exhibit a wedge or "V" of dead tissue, but this is not always the case. The leaf dieback can be quite extensive, but Vert generally does not kill the vines, as the varieties we grow commercially are tolerant of the disease. However, the vines may not grow as well as expected and may show nutrient deficiency symptoms or blossom end rot as they are not able to move water and nutrients up as fast as needed. When you cut into the vascular system, Vert-affected plants exhibit a tan vascular system. In contrast, Fusarium causes a much darker brown vascular discoloration. Above-ground, Fusarium-infected vines exhibit a distinct yellowing of the foliage, in the begin-

ning often of only a single branch. The yellowing extends all the way up to the newest growth, and often will progress to death of the branch or entire plant. Dieback due to Fusarium wilt seems to be more severe and widespread this year. Within the season, there is nothing that can be done to slow down or stop the disease progression. The standard recommendation is to rotate out of tomatoes for several years (or in the case of Vert, out of all hosts of *Verticillium*). That said, I have seen fields which stayed in tomatoes and the Fusarium wilt was less in subsequent years. This is presumably due to the development of a suppressive soil, which means that soil microbes that are "natural enemies" of the pathogens have built up their populations and are keeping the pathogens in check. This process can be promoted by additions of organic matter to the soil. The other strategy is to go with varieties that are resistant to Fusarium wilt race 3 (resistance denoted by F3 or FFF). Aside from resistance, there do seem to be distinct differences in susceptibility of varieties to these wilt diseases, so talk with your seed dealer about what might be a good resistant or tolerant variety for your situation.

Brenna Aegerter, Vegetable Crops Farm Advisor

## Armyworms in Rice—A Second Outbreak?

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Armyworms have already been a problem in rice this year, both in San Joaquin County and the Sacramento Valley. I learned of the problem in the Sacramento Valley in late June, and by early July, I was hearing about it here in SJC. Before stem elongation and grain formation, rice can generally tolerate feeding by armyworms. The UC Integrated Pest Management (IPM) guidelines recommend treating for armyworms when there is 25 percent defoliation on half the plants in an affected area *and* worms are present on the plants.

We would not expect the worms from the early outbreak to cause any further damage because the larvae fall to the ground to pupate, and thus, would drown in a rice field. Nevertheless, a second outbreak could occur if worms come in from surrounding areas and would be detrimental if the worms feed on emerging panicles. Treatment thresholds drop once panicles have emerged; treatment is recommended if 10 percent of panicles in an affected area are damaged *and* worms are present. If worms are not visible during the day, check for them at night.

Currently, the number of treatment options are few because registered products are generally not effective (pyrethroids) or have a long preharvest interval (diflubenzuron); however, the California Rice Commission (CRC) will seek emergency registration of another product if there is a second outbreak. To report a second outbreak, please contact the CRC directly at 916-206-5039.

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Keep in mind that there are two types of armyworms that could be flying – true armyworms and western yellowstriped armyworms. The true armyworm is the one seen in the early outbreak. The UC IPM website (<http://www.ipm.ucdavis.edu/PMG/r682300411.html>) distinguishes the larvae as follows: “Both larvae are striped and vary in body color but the older worms can be distinguished by markings on their sides. The western yellowstriped armyworm has a black spot on the side of its first legless segment, and the centers of spiracles on each body segment are white. The first legless segment of the armyworm does not have a dark spot and the center of each spiracle is black.” The adult moths are easily distinguished and are pictured.



Figure 1. True armyworm adult (Courtesy UC IPM)



Figure 2. Western yellowstriped armyworm adult (Courtesy Oregon State University)

Michelle Leinfelder-Miles, Farm Advisor, Delta Crops

## Verticillium Wilt on Young Almond Trees

I visited several second leaf almond orchards in Tracy last month showing severe Verticillium wilt. Cool wet spring conditions, heavy soils, or over irrigation of young almond trees can favor Verticillium wilt. Leaves on one or more branches, often on only one side of the tree, will turn yellow and wilt early in the growing season (Figure 1). Affected young shoots typically resemble a shepherd's hook (Figure 2). When shoot, branch, or trunk tissue of infected trees is cut, the vascular tissue and often much of the heartwood will display dark discoloration (Figure 3). Foliar symptoms usually appear only on young trees (first to fifth or sixth leaf). Older infected trees do not normally exhibit symptoms of Verticillium wilt, though yields may be reduced as a result. *Verticillium dahliae*, the causal fungus, can survive many years as hardened spores called microsclerotia, either in soil, in the debris of previous susceptible crops, or in roots of infected trees. The soilborne fungus invades tree roots and then



Figure 1. Verticillium Wilt

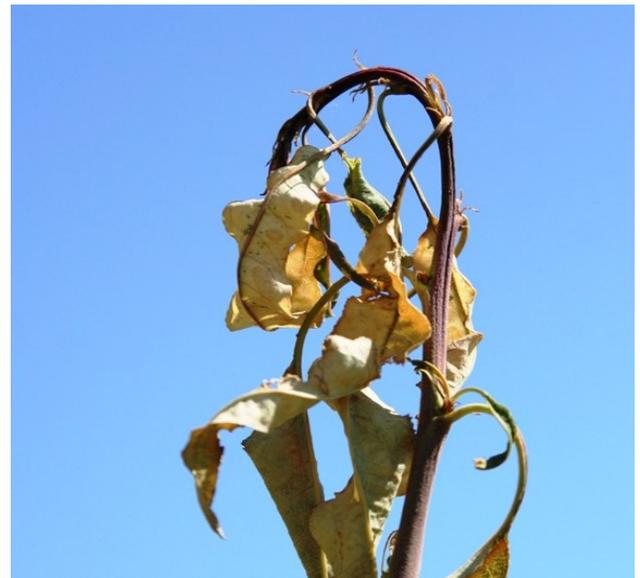


Figure 2. Shepherd's Hook

grows up the xylem, or water conducting tissues. The fungus eventually plugs up the xylem, and shoots wilt because they are not getting enough water. Hot summer temperatures eventually cause the fungus to die-back in scaffolds, but it can continue to live on tree roots. Do not immediately cut out diseased branches because they often grow back nicely with the summer heat. Wait until winter to prune when you can accurately assess the damage.

*Verticillium* naturally occurs in low populations in the San Joaquin Valley, but years of farming susceptible crops (tomatoes, cotton, cucurbits, strawberries, etc.) have increased microsclerotia populations in soils. When replanting in an area where susceptible perennials were previously grown, try to remove as many roots of the previous crop as possible, and have soil samples taken to determine inoculum levels. Soil samples should be taken from the top 12 inches, where populations will most likely range from 0-60 microsclerotia per gram. Wilt can occur with as little as 1-3 microsclerotia per gram under ideal environmental conditions (cool,

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Figure 3. Heartwood discoloration



## Announcements / Calendar of Events

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### Rice Experiment Station Annual Field Day

August 26, 2015

8-12pm

Rice Experiment Station, 955 Butte City Hwy, Biggs, CA 95917

For more information, visit <http://www.crrf.org/>.

### Alfalfa and Forage Field Day

September 18, 2015

8am-5pm

Kearney Agricultural Center, 9240 S. Riverbend Ave., Parlier, CA 93648

Visit <http://agric.ucdavis.edu/?calitem=270701&g=75579> for more information

### Soil and Water Short Course

November 17, 2015

8am-4:30pm

Walter A. Buehler Alumni Center, UC Davis

Visit [http://vric.ucdavis.edu/events/2015\\_soil\\_water\\_sc/soil\\_water\\_info\\_11\\_2015.htm](http://vric.ucdavis.edu/events/2015_soil_water_sc/soil_water_info_11_2015.htm) for more information and to register.

### Western Alfalfa and Forage Symposium

December 2-4, 2015

Reno, Nevada

Visit <http://calhay.org/symposium/> for more information and to register.

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wet soil). Pre-plant fumigation with chloropicrin or combinations of methyl bromide and Telone have reduced *Verticillium* populations. Solarization with clear plastic is also effective pre-plant while black plastic can be used post-plant. To solarize soil before planting, cover moistened soil with clear UV-inhibited plastic in late spring, and leave the plastic in place during the hot summer months. To solarize soil after tree planting, cover the soil around the trees with black plastic, and leave it in place for one to two growing seasons. Mariana 2624 has been shown to be somewhat more resistant to *Verticillium* wilt than peach or peach/almond hybrid rootstocks. Avoid interplanting young orchards with susceptible cover plants, such as cotton and tomatoes.

Brent Holtz, Pomology Farm Advisor and County Director



## 2014 Corn Silage Audit

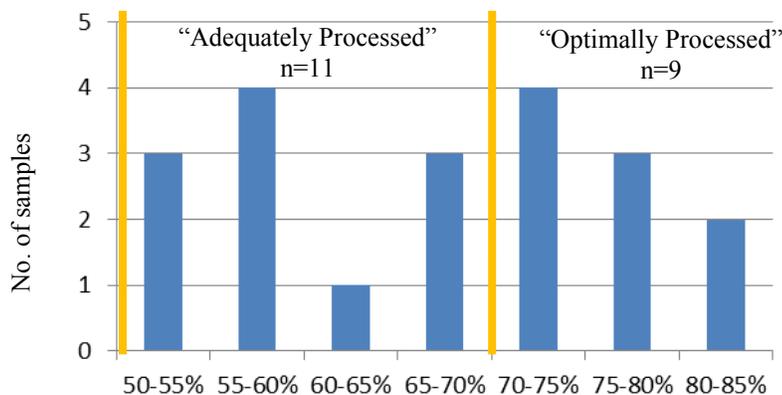
In summer 2014, we visited twenty San Joaquin Valley dairies during corn silage harvest, and sampled and composited five, consecutive truckloads of corn silage for nutrient analysis. **Table 1** includes the summarized nutrient results. Herd size ranged from 350 to 5250 cows (median=1800), and structures were primarily wedge piles (n=14), with fewer bunkers (n=3) and drive-over piles (n=3). Delivery rate varied; the five truckloads of corn were delivered in as little as eight minutes and in as many as 64 minutes. Twelve dairies utilized one packing tractor, seven dairies had two packing tractors, and one dairy packed with three tractors. Only two dairies did not utilize custom harvesting services.

**Table 1.** Nutrient composition of chopped corn (n=20) taken at harvest.

	% of DM						
	DM	CP	ADF	NDF	Starch	NFC	Ash
<b>AVG</b>	35.9	7.7	24.4	41.0	30.2	43.6	5.4
<b>MEDIAN</b>	35.9	7.8	24.9	42.3	29.0	43.2	5.4
<b>MIN</b>	31.2	6.2	20.2	35.2	23.3	36.6	4.2
<b>MAX</b>	40.3	8.8	28.3	46.7	36.7	50.7	6.8
<b>STD</b>	2.5	0.6	2.1	2.8	3.6	3.1	0.7

Corn silage processing score (CSPS) was also analyzed using the composited forage (**Figure 1**); nine samples were optimally processed (CSPS >70%) and eleven samples were adequately processed (CSPS between 50% and 70%). Corn silage processing score ranged from 50.7% to 82.2%. Even though all dairies kernel processed, and no samples were inadequately processed (CSPS < 50%), there is still room for improvement.

**Figure 1.** Corn silage processing score of chopped corn (n=20) taken at harvest.



Corn silage processing score is useful to gauge how the chopper performed and to plan for subsequent harvests, but unfortunately does not provide timely information to monitor, and make adjustments, during harvest. In a recent survey of dairy producers using custom choppers (n=138), 13% felt that chopping and processing either needed improvement or was not satisfactory, and 92.5% of producers (n=134) monitored kernel processing during harvest. Regularly checking the degree of kernel processing on-farm, throughout harvest, will allow for adjustments and improvements in kernel processing. Due to the large range in CSPS observed, we recommend hourly inspection of the delivered material, and open communication with the chopper to meet your harvesting goals.

Jennifer Heguy, Dairy Advisor, UCCE Merced, Stanislaus & San Joaquin Counties  
 Noelia Silva-del-Rio, Dairy Herd Health Specialist, UC Davis

UNIVERSITY OF CALIFORNIA

## Soil and Water Short Course

Tuesday, November 17, 2015

Walter A. Buehler Alumni Center, UC Davis



This short course will focus on the practical aspects of soil fertility in an era of escalating fertilizer costs and increasing government regulation of on-farm nutrient management.

**WHO SHOULD ATTEND:** Growers, consultants, government agency personnel, and others involved in soil fertility management will find this course valuable. This course is *not appropriate* for home gardeners.

**CONTINUING EDUCATION CREDIT:** This course is approved for **six hours** of CCA credit (3.0 Nutrient management, 3.0 Soil and water management).

**DATE and TIME:** Tuesday, November 17, 2015 from 8 AM-4:30 PM. Check-in will open at 7:30 AM.

**LOCATION:** Walter A. Buehler Alumni Center, UC Davis ([Google MAP](#))  
For directions and parking information, visit <http://campusmap.ucdavis.edu/?b=31>.

**COURSE FEE:** \$160.00 (if received by 10/30/2015) \$180.00 (if received after 10/30/2015)  
\$80.00 UC Farm Advisor or current student (Students must show valid school ID at check-in.) Limited to the first 4 requests.

The course fee includes light refreshments, lunch and handout materials. **Class size is limited**, so early enrollment is suggested. Additional information and registration is available on at:

[http://vric.ucdavis.edu/events/2015\\_soil\\_water\\_sc/soil\\_water\\_info\\_11\\_2015.htm](http://vric.ucdavis.edu/events/2015_soil_water_sc/soil_water_info_11_2015.htm).

WESTERN ALFALFA & FORAGE SYMPOSIUM

## Producing Forages in a Water Challenged World

DECEMBER 2-4, 2015

SILVER LEGACY RESORT CASINO, RENO, NEVADA

[calhay.org/symposium/](http://calhay.org/symposium/)

**Reduced Rate Early Bird Registration through September 15!!**

**EXHIBITOR & SPONSORSHIP OPPORTUNITIES ARE AVAILABLE**

Now in its 45th year, the Symposium is a comprehensive and educational program for anyone with an interest in important issues related to alfalfa and forages.

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### Day One—Dec. 2 (8 am—5 pm)

- Irrigation Management Workshop & Welcome Reception

### Day Two—Dec. 3 (8 am—5 pm)

- Symposium Session
  - Economics & Marketing
  - Water & Irrigation
- Symposium Banquet Lunch with Speaker
- Symposium Breakout Sessions
  - Pest Management
  - Alternative Forage Crops
- Exhibitor Reception & CAFA Auction

### Day Three—Dec. 4 (8 am—noon)

- Symposium Session
  - Forage Quality & Utilization
  - Hay Harvesting/Hay Management

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**FOR A COMPLETE SCHEDULE OF EVENTS, EXHIBITOR/SPONSORSHIP INFORMATION, AND SYMPOSIUM REGISTRATION, VISIT OUR WEBSITE [calhay.org/symposium/](http://calhay.org/symposium/) hosted by the California Alfalfa & Forage Association.**

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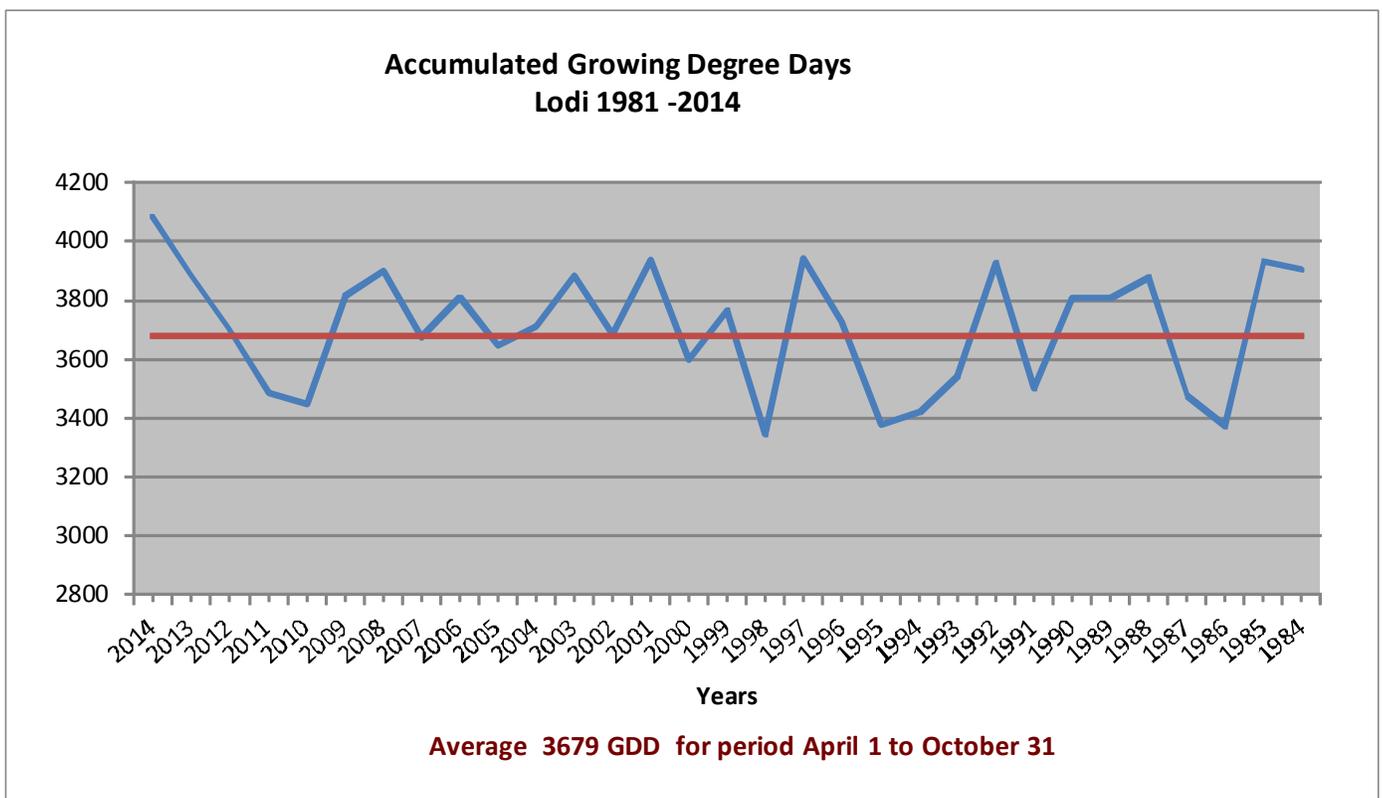
Contact us at (916) 441-0635 or [jane@agamsi.com](mailto:jane@agamsi.com).

## In the Vineyard

As the drought continues, the 2015 harvest has begun on the earliest date that most anyone can remember. It is an interesting year to say the least, but there have been previous harvest starts in July. Before anyone decides this is proof of anthropogenic Global Warming/Climate Change/Extreme Weather, let's look back on some of my observations from the recent past. Checking some of my notes, Zinfandel for red was picked in August in 2001, 2004 and 2007; at 24° to 26° Brix, compared to usual harvest dates around mid to late September for red programs. A Chardonnay clone trial was harvested on August 17 in 1994. In my 29 years as Farm Advisor, my impression has been that Mother Nature follows her own schedule irrespective of what we plan or do.

stressed compared to the green countryside back East. The positive aspect of weather this year is that the winter and spring rains mitigated the dry soil conditions that developed over the previous years from 2012 to 2014. This year's total rainfall was 13.2 inches in the North County, which at 80% of average is better than initially expected. The majority of this total (9.2 inches) came early in the fall and winter months from October through December. This helped to recharge the lower root zone to mitigate this year's record challenging dry spring.

Most years, it seems mornings will begin with significant dew on the windshield. This year with warm days, cooler than average nights and many windy days, there has been little morning dew compared to usual. At this point in the season (as was the case last year), I can literally count on one hand the number of days when there has



The 2015 season did start out with budbreak a full three weeks ahead of average, but the cool April and May slowed crop development enough to put the harvest about 10 to 12 days earlier than long term average. June tended to be warmer than average, but July was average or slightly below average for temperatures. Some color in Zinfandel occurred as early as June 23. And at this point, which is exactly halfway through the summer, there have been 8 days over 100° F, which is exactly half of the usual 16 to 17 days of 100° days for a season. The Growing Degree Day (GDD) accumulation as of August 1<sup>st</sup> is right on average for this point of the season, with about 2000 GDD accumulated. A recent visit to Alabama reminded me why California, and Lodi in particular, is a good place to grow grapes, but on returning, everything here – irrigated or not – looked pretty

been morning dew present. Maybe as evidence wild fires now burning to the west are proving difficult to get under control.

There were a lot of windy days in April, May and June – not quite as many as last year but quite a few through the spring and early summer. These windy days helped keep temperatures down and may partly explain the dry mornings, but similar to last year, conditions have been good for powdery mildew (PM). Although problems were scattered, it has been relatively easy to find PM, as disease pressure has been severe since April.

Mite problems have flared somewhat in the last month, but they are still occurring rather scattered, inconsistent, and light considering the dry soil conditions. I think the

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good soaking rains from October to December helped alleviate many problems that could have been a lot worse. Four dry years have taken a toll on older vines, (actually, 2011 was only slightly below normal!), but with three very dry years out of the last four, and two big crops in 2012 and 2013, there is a fair amount of dieback and dead vines. In Old Vines (30 year plus), this was especially evident, and they won't recover completely, but with a halfway "normal" fall/winter, vines should stabilize and maybe recover somewhat.

Chardonnay appears to be right behind and almost ready as I write this. Some small plantings of German varieties in the Victor area have been harvested as of August 3. Some general observations (no data) come to mind: 1) More evidence of trunk canker diseases and vine dieback from measles/esca/vine decline or as *Eutypa* dieback/*Bot (rosphaeria)* canker; 2) Fewer weed problems; 3) More concern of apparent early and increased vine mealybug (VMB) activity; and 4) Less sour (summer bunch) rot compared to last year at this point in the season. This is just my sense of things and not backed up by any numbers.

This brings us to the task at hand – harvest. Harvest got under way about July 24 with Pinot grigio, some Sauvignon blanc, some Muscat selections, and some Pinot noir for sparkling wine. The first Zinfandel berries with color only began to show on June 23. This is compared to more typically beginning to show color and berry softening after Independence Day. Some of the mid-season reds are confusing the "normal" maturity sequence, with some Pinot noir and Zinfandel are approaching 24° Brix as I write! The crop looks to be about average across varieties; exceptions on the heavier side of average might be Chardonnay, while exceptions on the light side of average might be older Zinfandels, all depending on vine age, variety, site, and grower/winemaker goals.

Strong shoot growth early in the year from good soil moisture may help keep berry and cluster size close to normal, although generally slightly below average. Cluster counts are average, in many cases as good as last year, but cluster size and set varies by variety and location. Possibly some of this variability depends on the erratic temperatures during a rapid bloom period and four years of drought. Overall berry and cluster 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 begins, but some sunburn has been reported. Fortunately, sour (summer bunch) rot seems much less than last year, so far.

Market demand continues to be good if not great, improved for varieties like Cabernet Sauvignon, Petite Sirah, Muscat varieties, Red Zinfandel, and even Merlot, among others. Other varieties like Chardonnay, Pinot grigio (gris), Pinot noir, and Sauvignon blanc still seem

to be in good demand. The mini-boom in planting new vineyards and the replanting of old blocks has slowed. The problem of the general economy sluggishness remains, even with wine consumption still growing slowly. Local growers and agriculture overall are still in a relatively good position compared to most other sectors of the state and national economy, maybe because everyone needs a drink.

Vine mealybug is still spreading through the county, so be aware of any new infestations, often indicated by sooty (black) mold and honeydew staining on bark of the trunk or cordons, or excessive honeydew and waxy secretions in clusters, on spurs, or along 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. It may be the mild and dry winter, along with the early budbreak that increased VMB movement earlier. It does appear the materials available for control are working but have taken longer to fully suppress active populations. At this point, there don't appear to be any control problems, but be on the lookout.

The light brown apple moth (LBAM) continues to expand its territory in the south part of the county around Manteca since it was found in 2009. It is similar to omnivorous leaf roller (OLR) in appearance, number of host crops, and damage, but also in control. In some areas of the state, it does appear that LBAM is showing some effects of control by native beneficial insects. Learn more about LBAM at: <http://www.ipm.ucdavis.edu/EXOTIC/lightbrownapplemoth.html>. The Ag Commissioner's staff is monitoring both of these threats as well as several other invasive species affecting other crops.

This year, an average grape crop may help maintain a balanced inventory in the wineries and slow any potential price drops. For growers and most other businesses, costs and regulations continue to increase, but more recognition of affordable and quality Lodi wines can help sustain operations despite rules, regulations, and inflation. There are a lot of unknowns and uncertainty in the world, but Lodi and San Joaquin County are in a good position to continue the tradition of quality wines of value. Have a good harvest.

Paul Verdegaal, Viticulture and Pomology Advisor

# Managing Navel Orangeworm in Walnuts is a Season-long Effort

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Navel orangeworm (NOW) seems to be on the rise as a component of harvest “insect” or “worm” damage that shows up on walnut grade sheets. We can only speculate about the reasons for this, which could include: the move toward softer and selective insecticides to control other in-season pests like codling moth, aphids, and husk fly that do not have the suppressive impact on NOW that the older broader spectrum products had; drier recent winters have allowed more unharvested mummy nuts to remain in tree canopies over the winter serve as overwintering sites for NOW larvae, rather than being dislodged by winter storms; more prolonged harvest periods due to dry warm weather, allowing more time between husk-split and harvest for NOW to lay eggs on maturing nuts; and, in at least some cases, a growing laxity with respect to the need to destroy mummy nuts on the orchard floor in early spring before NOW emerges from them.

It is unfortunate that most walnut handlers no longer distinguish between codling moth and NOW when reporting internal insect in harvest grade sheets. Not knowing what portion of reported “worm damage” is due to these two pests makes it difficult to adjust control strategies appropriately the following season. It is not difficult – with a little training and experience – to distinguish between codling moth and NOW and the damage they do to nuts. Implementing an annual block by block program of nut sampling and crack-out evaluations (after harvest but before hulling) is an excellent way to gauge the success of your management efforts and make sure they are directed at the right pest.

Whatever the reasons for the increased prevalence of NOW in harvested nuts, there are a number of effective tools for managing NOW that have been known for some time, and a few new ones coming slowly into use.

## **NOW Monitoring**

Egg traps have been available for some time but unfortunately have been shown to be a generally poor indicator of NOW population and predictor of potential harvest damage. Egg traps do work in walnuts until around June, but much less so after that. The number of eggs and how long into spring they continue to be laid on traps and elsewhere at high numbers depends on abundance and fertility of the overwintering (first flight) moth population. Early season egg trapping results can thus provide added information on the NOW population and its potential to carry over in high numbers in subsequent generations.

Pheromone lures are available from at least two suppliers and can be used in standard wing or delta sticky traps to monitor in-season male NOW flights. Lures that

attract both males and females are available from one supplier, and other companies are in the process of developing them. There are three to four flights per season, beginning as early as late February in some years. Because these lures have only been available for a few years, we do not yet have reliable information on the relationship between trap catches and potential harvest damage. In the meantime, however, with good record keeping their use over time can help contribute to a better understanding of this relationship for individual orchards over time and provide information on the relative abundance of NOW among orchards and within a given orchard.

## **Sanitation**

Reducing the number of overwintering mummy nuts in advance of emergence of the overwintering generation is the foundation of an integrated program for managing NOW. In two ways, mummy nuts serve to “bridge” NOW from one season to the next: 1) NOW larvae overwinter in these nuts and 2) after pupating and emerging from them as adults in early spring, moths seek these mummy nuts out (there is no other food source in the orchard at this time) as a preferred site to lay eggs, leading subsequently to development of the next generation. The destruction of mummy nuts before adults begin to emerge (by shaking to the ground if needed, blowing into orchard middles and mowing to pulverize them) is an effective tactic in breaking the year-to-year development cycle of NOW. In the northern San Joaquin Valley, it is recommended that this be done no later than March 15 to effectively break this important portion of the in-orchard development cycle.

## **In-season blight, insect and sunburn control**

During the growing season, NOW adults lay eggs on nuts and nearby leaves. NOW larvae cannot penetrate the husk of undamaged walnuts. Thus, another proven cornerstone of good NOW management is to minimize in-season damage by walnut blight, codling moth, sunburn and other sources of injury that damage the husk and allow NOW to enter.

## **Prompt harvest**

The shorter the interval between the onset of husk-split and harvest, the shorter the opportunity time for NOW present in the orchard to lay eggs and infest nuts. Ethephon helps advance and shorten this window and has been shown to be a useful tool in reducing NOW damage. A two-shake harvest to remove the harvestable and NOW-susceptible portion of a slow maturing crop while waiting for the balance of the crop to become harvestable, also helps reduce NOW infestation.

## **NOW insecticide treatments**

The concentrated spring emergence of the first flight of NOW would seem to represent a good opportunity to reduce orchard NOW populations with insecticide treatments and, thereby, reduce the likelihood of damage. To date, limited research on this approach has not shown

*(Continued on page 11)*



