

Monitoring Pests in an Almond Orchard

Pest monitoring is the heart of any orchard integrated pest management (IPM) program and is cost-effective and easy to implement. Traps and lures are relatively inexpensive and the effort it takes to hang, read, and maintain traps is minimal. Accessing degree-day data and keeping records adds a little more time, but all in all, you get your money’s worth. Pest monitoring allows you to effectively time sprays and to skip sprays when they are not needed. The following is a brief guide to hands-on pest monitoring for anyone who has not yet hung a sticky trap or looked at a leaf using a hand lens.

There are many traps available for monitoring pests. The disposable wing trap is good for trapping peach twig borer (PTB) and other moth pests in almonds, other nuts, and tree fruit. This trap consists of a paper top and a gridded sticky bottom, folded and assembled with a wire hanger and two plastic spacers (Figure 1). A pheromone lure or “cap” is dropped onto the sticky surface and the trap is hung inside the canopy in the northeast (shaded) quadrant of the tree, secured to a limb 6 to 8 feet high. A higher trap, placed with a pole or attached to a loop of tree rope, might catch more moths but a lower trap is easier to secure and service. Traps for monitoring different pest species can be hung in adjacent trees. To establish a “trapping station” within the orchard, pick a row that is marked on the edge with a utility pole or some other landmark and cluster the traps 10 to 15 trees in.



Figure 1. Disposable wing trap for monitoring peach twig borer and some other moth pests of almonds.

Different types of traps are used for monitoring different almond pests. A navel orangeworm (NOW) egg trap is a small black plastic canister that is half filled with almond meal/ almond oil bait and hung in the tree like the wing trap. The adult NOW moth lays her eggs on the surface of the canister. To trap San Jose scale (SJS), a sticky card with a secured pheromone lure is hung at eye level well within the canopy, attached with a wire twist tie to a small limb. The trap attracts the male flyers as well as some beneficial wasps that parasitize immobile scale. The trapped SJS flyers, scale parasites and the developing NOW eggs on the egg traps are, when viewed through a hand lens, easily recognizable after you have seen them once.

Traps are placed out in the orchard early in the season before the pests are active. The date that a trap starts catching a targeted pest is the “biofix” for that pest. Treatment timing recommendations are based on degree-day accumulations starting at the biofix, so the better you pinpoint that date, the more effective a treatment can be. Checking a trap at least twice a week to establish the biofix is recommended. Once this is established, it can be informative to continue checking the traps weekly, counting and removing moths as the season progresses, checking more often when a new generation biofix is expected. The grid simplifies the counting of moths when there are many in the trap. The bottom is replaced when it is full or dirty but the wing trap top should last the whole season. Counting the tiny male scale insects on a sticky card is time consuming. If the scale population is high (100s per card), count only those in the highlighted grid squares, estimate the total and replace the sticky card. With the NOW egg trap, it is relatively easy to count the eggs as you remove them with a small brush or the tip of a pocket knife. Lures and bait should be replaced periodically, usually every four weeks. Neglected traps will still catch pests but the numbers can be misleading.

A few almond pests can be monitored without traps. Two species of ants – fire ants in the south and pavement ants in the north – can damage nuts that are drying on the orchard floor at harvest time. Monitor ants by identifying and counting ant mounds between trees. Count these in the spring since

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ants spend the hot summer months below ground. Be aware that some ant species are beneficial. Native gray ants eat PTB larvae and other insect pests and leave almonds alone. If a pest ant population is high, treat before harvest or be prepared to limit how long the nuts dry on the orchard floor. The latter may not be possible if you practice early harvest for NOW control. Mites are monitored starting in early summer (or earlier) by observing leaves for damaging spider mites and their predators. Pick leaves from trees on the dry orchard edges or in other known orchard hot spots. Observe both sides of the leaves with a hand lens. Often, trees can withstand some mite presence if predators are also present. Sampling protocols for mites and ants, as well as trap placement dates and treatment timings for all the major almond pests can be found in the almond pest management guidelines at <http://ucipm.ucdavis.edu>.

A 'May Spray' can be an effective treatment in almonds with the newer reduced-risk materials. Insecticide treatment decisions should be based on previous years' harvest evaluation and mummy nut load in the orchard and adjacent orchards. If harvest reject levels were acceptable and mummy nuts are fewer than two per tree, treatment with insecticide might not be warranted. When treatment is necessary, timing sprays using trap catch data, shoot strike observations, and other field scouting methods can greatly increase treatment efficacy. Use of pyrethroid insecticides at this time can flare mites later and necessitate a mite treatment.

Matching Animal Requirements With Feeding Practices

Our February dairy article talked about the cost of feeding excess. This follow up article expands upon the topic by explaining the logic and lost opportunities associated with over supplying nutrients.

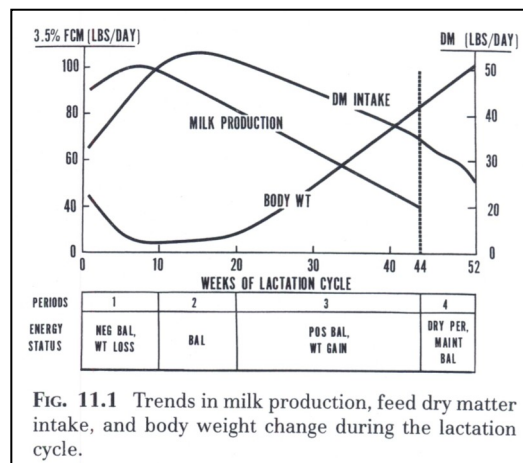


FIG. 11.1 Trends in milk production, feed dry matter intake, and body weight change during the lactation cycle.

From: Bath, D., Dickinson, F.N., Tucker, H.A., and Appleman, R.D. Dairy Cattle: Principles, Practices, Problems, Profits. Philadelphia: Lea & Febiger, 1985. Print.

(Continued on page 3)

Pest	2010 Biofix	Treatment timing (DD after biofix, °F)	2010 Estimated Treatment Date
PTB	4/19 - Begin catching male moths in pheromone traps	200 - 450 ^a , initial to peak moth flight activity	5/8 - 5/25
NOW	5/4 - Start of consistent egg laying on egg traps	100, beginning of egg hatch	5/15 ^b

^a Results of insecticide trials for peach twig borer (PTB) control indicate that the earlier timing is as effective with Intrepid, Delegate, and Altacor. The diamides are more effective at the later timing.

^b There is some overlap between NOW and PTB and both pests (if present) can be treated together with the earlier PTB materials.

Dan Rivers, Research Associate, Almond Pest Management Alliance

Calendar of Events

Central San Joaquin Valley Summer Almond Meeting

June 23, 2010, 8 am to 12:30 pm
 UCCE Merced County office, 2145 Wardrobe Avenue
 Merced, CA 95341
 Contact: David Doll Merced Co. Farm Advisor (209) 385-7403
 2.5 hours of PCA, CCA and Private Applicators credit have been requested, including 0.5 hours of Laws & Regulations

Walnut Dehydrator Workshop

June 29, 2010
 Stanislaus County Ag Center, Modesto.
 Practical and comprehensive one-day workshop on efficient dehydrator design and operation, reducing energy and capital costs of drying, pre- and post-hulling sorting, and other topics. Detailed program and registration information forthcoming.



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In this article, we discuss the intricate relationships between milk production, dry matter (DM) intake and body weight, and how your animals' nutritional needs are determined by stage of lactation and level of production. The first part of the article will describe the lactation cycle (Figure 11.1, see reference on page 2), followed by an example of how feeding your animals properly will keep your animals healthy, and keep money in your pocket.

When a cow calves, she enters a period of **negative energy status**, caused by DM intake limiting her ability to meet the demands of lactation. This will be the case for approximately the next 10 weeks of lactation. Energy is partitioned to the mammary gland for milk synthesis and because she cannot consume enough DM to meet the demand of lactation, she takes it from her body reserves, and body weight decreases. For this reason, she is at a high risk for metabolic diseases, especially during the transition period. The transition period is comprised of the three weeks before and after calving, and is the time when milk fever, ketosis, retained fetal membranes, metritis, and displaced abomasum primarily affect cows.

After production peaks at around 56 days in milk (DIM), the cow's production slowly tapers off. This is matched with increased intake, which reaches the highest levels between weeks 10 and 20 of lactation. During this time, the cow is in a state of **balanced energy status** (bodyweight is maintained).

The third period, **positive energy balance**, is when the cow compensates for the body weight lost in the previous two periods. Dry matter intake continues to taper off, but is at a level that allows for milk production (decreasing), continued weight gain, as well as maintenance of pregnancy. Weight gain continues throughout the **dry period** as the cow approaches the transition period.

Despite the fact that nutrient requirements change as an animal proceeds through her lactation, it is not un-common for dairy producers to feed all lactating cows one ration. The idea behind this practice is that by feeding one ration to the herd, there is little chance of under-feeding the lower producing cows, ensuring maximum milk production. However, the cost of this practice is rarely justified with more milk, or more importantly, increased profits. Let's work through an example to illustrate our point (all milk production numbers are presented as fat corrected milk).

In our example, we will assume the lactating herd is broken up into two groups, high production and late lactation. Currently, they are fed one ration designed to meet the requirements of the highest producing cows in the herd (80 lbs milk). The ration costs \$5.50 per head per day for high cows consuming 57 lbs of dry matter. The late lactation cows are producing 60 lbs of milk and eating 54 lbs of dry matter (Table 1).

In this example, the average feed cost to produce 100 lbs of milk is \$7.65 per head per day. While the average feed cost per hundredweight in our herd is \$7.65, the cost for the high string is \$6.88 while the low string is \$8.68. This large divide in the

cost to produce milk is caused by two factors: 1) Late lactation cows are producing less milk, while their intakes are relatively high, and 2) These cows are consuming a diet that is supplying nutrients above their requirements, and the extra energy, protein, etc. is going on their back in the form of fat and out into the environment in the form of feces. The opportunity to decrease the cost per hundredweight and save feed comes from feeding your lower producing cows a ration that is designed to meet their required intake levels (three lbs lower than your high cows) and is less nutrient dense. In general, lower cost ingredients contain fewer nutrients, and can be fed at higher levels to the lower producing cows, based on their biological needs.

A great way to determine if you are feeding excess protein is to measure milk urea nitrogen (MUN). Milk urea nitrogen increases when the cow is being provided excess protein beyond her biological needs. Ideally, string MUN's will run between 10 and 14 mg/dl. A sample above 14 mg/dl is an indication that excess protein is being fed, and it may be beneficial to re-evaluate the ration.

Another tool to evaluate the nutritional status of your herd is to measure feed efficiency. Feed efficiency is the amount of milk produced (fat corrected) divided by the amount of dry feed consumed on a daily basis. Using our example herd, the average feed efficiency is 1.26 lbs of milk per pound of DM consumed. For comparison, the low string is 1.11 while the high string is 1.4 lbs of milk per pound of DM feed consumed. The benchmark for feed efficiency is somewhere in the range of 1.4 -1.6 lbs of milk per pound of DM feed consumed, but will fluctuate depending on stage of lactation and animal age. In the above situation, we are over feeding nutrients to an already less efficient group of animals. While changing nutrient density will not affect feed efficiency (still consuming the same amount of DM), it will decrease the cost of feed (lower priced ingredients) thus increasing your return on investment.

The information in this article is presented to help you better understand the principles of proper feeding management. In the example above, feeding one ration to the entire lactating herd was increasing the cost of producing milk. Feeding according to animal requirements is good for the animal, the bulk tank, as well as the pocketbook.

Table 1. Example Scenario

	High	Low	Average
DMI	57.0	54.0	55.5
\$/head/day	\$5.50	\$5.21	\$5.36
Milk (fat corrected)	80.0	60.0	70.0
\$/cwt	\$6.88	\$8.68	\$7.65
Feed Efficiency	1.4	1.1	1.3

Jennifer Heguy, Dairy Advisor
Jed Asmus, Independent Nutritionist

Tomato Powdery Mildew, Part 2

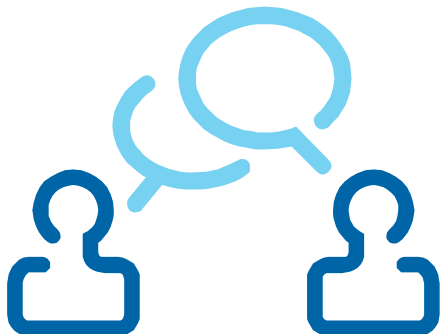
In my February article I reported on the results of our CTRI-funded group project on powdery mildew in processing tomatoes. In this issue I wanted to report on another tomato powdery mildew fungicide efficacy trial I conducted in a late-season fresh market tomato field out near Farmington. Three applications were made of each material in a replicated design. Best materials in this trial were Luna Sensation (fluopyram and trifloxystrobin), Luna Privilege (fluopyram), Quadris (azoxystrobin), Quadris Top (azoxystrobin and difenoconazole), and Vivando (metrafenone). See Table 1 (on page 5) for results of all treatments. Note that of those mentioned above, only Quadris and Quadris Top are currently registered for use on tomatoes and Quadris Top does not have a label for fresh market tomatoes. There were no differences in yield between treatments in this trial.

Some of you have commented to us that our control programs in the CTRI trials are not economically feasible. We always appreciate your feedback and assure you that 1) we are in no way recommending that anyone go out and spray their field eight times per season and 2) our UC group is very much interested in identifying economically viable programs for growers. We do understand that the bottom line is not really to control the disease at any cost, but to produce a good crop with as few inputs/costs as possible. However, we wanted to start with some intensive programs to answer first the question: if we can

Foreman Training Video Tapes

Growers and producers may now view video tapes useful for Spanish-speaking foreman training. They follow the book *Labor Management in Agriculture: Cultivating Personnel Productivity*. The first two videos focus on employee discipline.

Farm employers would do well to first share the first (**Video 14-001**) with supervisors and give them the assignment to engage workers in conversation before praising. Praise must be sincere, of course. In the next video (**Video 14-002**), the seven steps to more effective employee discipline is depicted. Once again, front end supervisors begin by engaging employees. We do not want workers to think, however, that every time that a supervisor shows an interest in them it follows that there is a correction coming. That is why it is so important for the supervisors to master the simple steps in the first video before watching the second.



keep the foliage consistently protected, is it possible to control this disease with the currently registered materials? As we move forward, we hope to be able to make recommendations on how a smaller number of applications might best be timed. Unfortunately, we are not positioned to forecast disease – so while two well-timed applications might be enough under some circumstances, we may never be able to predict in advance or generalize about when those two applications would be best timed. The grower and PCA, while also not being able to predict how fast mildew will develop, do have knowledge of some of the factors at play in their fields and will be the ones to make the best decisions about how to deploy a limited number of applications, hopefully informed by some solid research-based information from our UC group.



Variety susceptibility: Tom Turini and Michelle Le Strange took varieties from our statewide processing tomato variety evaluation program and planted them in a separate planting apart from the variety trial and evaluated them for tolerance for mildew in the absence of sprays. It is clear from their findings that mildew can infect and spread on all varieties, with the exception of varieties with a mildew resistance gene (these are rare). Among varieties in the less susceptible category are H 9780; while SUN6368, SUN6366, H 8004 and others were in the highly susceptible group. The variety AB 2 seems to fall somewhere in the middle, being more mildew tolerant than the highly susceptible varieties.

Brenna Aegerter, Vegetable Crops Advisor

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There are some situations where the seven steps do not work without some important modifications. New videos will be added to this page:

<http://www.cnr.berkeley.edu/ucce50/agro-laboral/7libro/002s.htm>

If the videos do not open, try downloading Real Player and Adobe Flash Player. These may be respectively downloaded from <http://www.real.com/> and <http://www.adobe.com/products/flashplayer/>. This is a public service of the University of California.

Gregorio Billikopf, Labor Management Advisor

Table 1. Impact of fungicides and adjuvants on tomato powdery mildew in a late-season fresh market tomato (cv. Scout) located near Farmington, CA. Note that many of these materials are not currently registered for use on tomatoes. Always check pesticide labels before making recommendations or applications.

Product(s)	Rate (product/A)	Adjuvant	Powdery mildew (% leaf area diseased) ^x	
Luna Sensation (USF2016)	7.6 oz	Dyne-amic 0.125%	7.2	g
Quadris	6 oz	Latron B1956 0.25%	8.1	fg
Luna Privilege (USF2015)	6.84 oz	Dyne-amic 0.125%	8.6	fg
Quadris Top	8 oz	Latron B1956 0.25%	9.5	efg
Vivando (BASF056F)	15 oz	Mor-Act 0.25%	10.4	defg
Sil-Matrix	1%	Latron B1956 0.25%	11.8	cdefg
Regalia plus Rally	0.5% + 2.5 oz	Nu-Film P 0.02%	11.8	cdefg
Sonata	4 qt	none	11.8	cdefg
Sulfur DF	20 lb	none	11.8	cdefg
Vivando (BASF056F)	15 oz	Silwet 0.06%	12.3	cdefg
YT669	6 oz	Latron B1956 0.25%	12.8	bcdefg
Cabrio	16 oz	Latron B1956 0.25%	13.2	bcdef
DPX-LEM17	24 oz	none	13.2	bcdef
Actinovate fb Sulfur DF	9 oz fb 20 lb	Silwet 0.06% fb none	13.2	bcdef
Regalia fb Rally	0.5% fb 4 oz	Nu-Film P 0.02% fb Latron B1956 0.25%	14.6	abcde
DPX-LEM17	10 oz	none	15.5	abcd
Serenade	3 lb	none	15.5	abcd
sulfur dust	40 lb	none	15.5	abcd
Actinovate plus Sonata	6 oz + 2 qt	none	15.5	abcd
Sulfur DF	20 lb	Oroboost 0.25%	15.5	abcd
Sil-Matrix	0.50%	Latron B1956 0.25%	15.9	abcd
Kaligreen	3 lb	none	16.9	abc
DPX-LEM17	16 oz	none	16.9	abc
Rally	4 oz	Latron B1956 0.25%	18.3	ab
Rally	4 oz	Wet-Cit 0.25%	18.3	ab
Non-treated control	-	none	19.6	a

^x Means followed by the same letter are not significantly different ($P = 0.05$)

Crop Digest: Grapes

After three dry winters, 2010 starts out with good soil moisture. As of May 1, the north county is at 18.9 inches of total rainfall, which is about two inches above average, and the south county is slightly ahead of average at 14.1 inches total. Most of the rain came in well-spaced events and in significant amounts (effective rainfall needs to be greater than 0.25 inches for one event). Because of the well-spaced rains and low relative humidity, early season problems of *Phomopsis* cane and leaf spot and *Botrytis* shoot blight have been minimal.

The start of the season has been windy, with many days since budbreak of gusts above 20 mph. The generally windy conditions have made sulfur applications difficult, but at the same time cool temperatures have lowered powdery mildew pressure somewhat. The cool temperatures have also slowed shoot growth and maybe helped limit the amount of broken shoots

from the winds. There have been some damaged shoots, but not as much as might be expected.

The month of April ended with about 200 growing degree days (GDD), which is the third coolest April in the last 30 years of district weather station records. April of 2003 and 1983 were cooler at 179 and 177 GDD, respectively.

The recent storms and cool conditions will help delay the need for significant irrigation. But watch the soil moisture either with soil moisture probes or a quick check by auger or even shovel in sandy sites and traditionally dry areas of your vineyard(s), especially if cover crops are present. Soil moisture is better than it has been for three years, but soil profiles are not excessively wet as in the wet years of 2005 and 2006.

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Unless a cover crop is present, vines have been using only about 0.15 inches of water per week (or very “seat-of-the-pants,” about 3 hours worth of irrigation time). During that same period, orchards have been using about 0.75 inches of water per week. That will double soon and increase further as the weather warms. That considered, it is good to stay ahead and avoid using deep soil moisture, which is good to have available for late summer and early fall.

Powdery mildew pressure has been light until the last two weeks. Disease development shouldn’t be too severe as it has been very cool, but you may need to be on an aggressive schedule of protection if it remains mild from here on out.

Keeping costs down and avoiding resistance development probably requires a powdery mildew program that includes sulfur. Wettable sulfur after budbreak can be a very effective choice for doubling up on an early start to powdery mildew control. With sulfur costs escalating, some of the newer materials are more cost competitive, although ground coverage is still much slower than with dusting sulfur. Whatever the material of choice, a good powdery mildew program includes: some sulfur, rotation of materials between years, and complete coverage, - each important.

This year looks to be another bad one for gophers and voles. They are back and active at this time and probably need some attention, even with the benefit of owls, hawks, and snakes (or cats). Owl boxes and raptor perches help, but control is needed before they reproduce and litters begin to disperse. See the UCIPM guidelines for some ideas:

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

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

Be on the lookout for some new problems. Vine mealybug (VMB) continues to spread. There are options for control, but the registration of one of the better materials has been stalled by environmental lawsuits. VMB is now becoming active enough to begin looking. Vigilance is needed, so look in areas of bird roosting and watch for spots of high ant traffic that lead into vines. Light brown apple moth (LBAM) is in the county as of last season in the Manteca and Tracy areas. It is controllable as is the similar established pest omnivorous leafroller. LBAM does unfortunately require quarantine and more paperwork.

A more serious pest is now the European grapevine moth *Lobesia botrana* (EGVM). It is now in Napa, Sonoma, Yolo, Mendocino and Fresno counties. It was first identified in Napa last September. It also requires quarantine and is controllable, but is much more devastating than LBAM as its larvae feed directly in flower clusters and developing fruit all year. And egg laying by the female is much more dispersed, so it will spread faster both within and between vineyards. See the UCIPM site at <http://www.ipm.ucdavis.edu/EXOTIC/eurograpevinemoth.html>

If you have any questions give me a call (for those of you still with the old office number, my new number is 953-6119). Or check with Mike Wanless at the Lodi Winegrape Commission office. The 2010 season may be somewhat challenging, but Lodi and San Joaquin County are in as good a position as anywhere to do well.

Paul Verdegaal, Farm Advisor



Greenhouse Gases and Livestock Production

This past March, Frank Mitloehner, UCCE Specialist in Livestock Systems Air Quality, presented a talk at the Oakdale Livestock Forum titled “Clearing the Air: Livestock’s Contribution to Climate Change.” I have received requests from some people that were not able to make it to the forum to provide a brief synopsis, so for those that couldn’t make it, here are a few high points.

The United Nations released in 2006 a report titled “Livestock’s Long Shadow” detailing that 18% of global greenhouse gases can be attributed to livestock production, from range to plate including transportation into the equation. According to the UN’s calculations, livestock production has more of an effect on global greenhouse gases than transportation, which has spurred people to promote “Meatless Mondays” to reduce your carbon footprint. Dr. Mitloehner has wanted to “clear the air” regarding the amount of greenhouse gases that can be attributed to livestock production. He pointed out that the UN report did not make a fair comparison between livestock production and transportation. The transportation industry was evaluated only at a completed product level, looking at the impact of vehicles driving on the road but not including the production of vehicles. So the comparison was “apples to oranges”.

He also pointed out that the global averaging does not provide accurate information on the regional level for policy to be determined to reduce greenhouse gases. Dr. Mitloehner’s research-based calculations are that livestock production in the United States contributed just under 3% of the greenhouse gases, where transportation in the US contributes 26%. Most of our arable land is already developed and in production, and we have efficient production systems compared to developing countries. In developing countries, livestock production will contribute to a higher percentage of regional greenhouse gases primarily because of changes in land use patterns – i.e., the removal of forest for production of other crops.

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First Annual Overhead Irrigation and Conservation Tillage Twilight Field Tour and Barbeque

Thursday • June 10, 2010 • 5 - 9PM

UC West Side Field Station
17353 West Oakland
Five Points, CA 93624
(559) 884-2411

For more info:

Jeff Mitchell, mitchell@uckac.edu

This will be a concentrated, information-rich opportunity for you to learn about two technologies ---overhead irrigation and conservation tillage--- that have the potential to revolutionize crop production systems in the San Joaquin Valley by reducing production costs, fuel use and labor requirements, while also decreasing emissions and enabling highly efficient water application to crops. These technologies, while widely used in other parts of the world, are relatively new in California. Within the past few years however, SJV farmers and researchers, along with a number of representatives of companies that supply both overhead mechanized irrigation systems and conservative tillage equipment, have begun to gain considerable experience and knowledge on their potential to improve current cropping systems.

The June 10 Twilight Field Tour will highlight this locally-developed information by bringing together leading experts in these technologies for an information-packed session.

A barbeque dinner will be provided.

FAMILIES
WELCOME

UC DAVIS
COLLEGE OF AGRICULTURAL
& ENVIRONMENTAL SCIENCES

NRCS



RESOURCE
CENTER



Sustainable Conservation



5:00 pm | Welcome
Overhead Irrigation Systems and
Conservation Tillage Equipment Displays

5:30 pm | Barbeque Dinner

6:00 pm | Field Tour begins

Tentative tour stops will include:

Irrigation uniformity of overhead systems
Brooks Lander, UCD Graduate Student

Overhead and drip-irrigated vegetable rotations
Dan Munk, UCCE Fresno County
Dean Best, Netafim

How to increase soil carbon
Will Horwath, UC Davis

Economics of CT
Karen Klonsky, UC Davis

Today's Center Pivots and Linears
Harold Hughes, Reinke Irrigation

Overhead Irrigation 101
Ray Batten, Pat Murray, John Bliss,
Valmont Irrigation

Nozzle packages
Dan Schueler, Senninger Irrigation

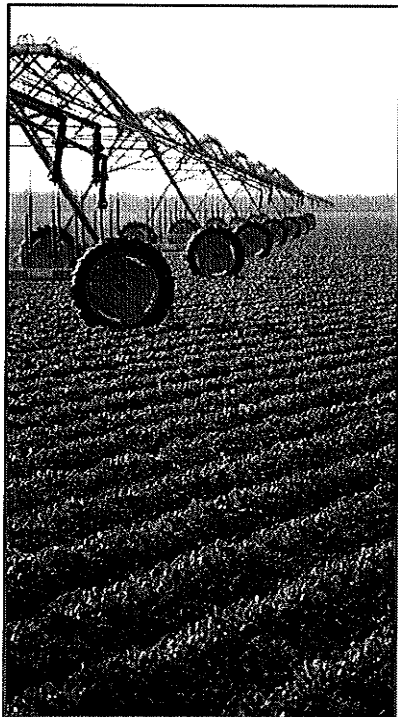
Introduction of the
California Overhead Irrigation Alliance
Jerry Rossiter, CISCO AG

Overhead Systems Management
Chuck Powell, Lindsay Zimmatic

Farm Experience with Overhead Irrigation
John Diener, Red Rock Ranch
Scott Schmidt, Farming "D"

Pest Mgmt in CT & Overhead Systems
Anil Shrestha, CSUFresno
Tom Turini, UCCE Fresno
Kurt Hembree, UCCE Fresno

FAMILIES
WELCOME



First Annual
Overhead Irrigation and
Conservation Tillage
Twilight
Field Tour and Barbeque

Thursday • June 10, 2010 • 5 - 9PM

(Continued from page 6)

Within the US livestock industry, fermentation and manure management are the most important areas where greenhouse gas production can be attributed directly to livestock. Management practices that can improve efficiencies of production and reproduction are going to be the most important management tools to significantly reduce livestock's impact on the environment.

Livestock production does have an impact on the environment but it is not as large as is being reported and in the US, does not contribute nearly as much as transportation. Our improvements in efficiencies over the years (think of increased calving rate, more pounds of beef produced) have made strides at reducing livestock's impact. The University will continue to research different ways we can improve efficiencies and decrease our impact on air quality, and producers will continue to adapt management practices, but future comparisons between different sectors need to compare "apples to apples" to provide an accurate picture of contributions to greenhouse gases.

If you are interested in reading Dr. Mitloehner's "Clearing the Air: Livestock's Contributions to Climate Change" you can find it at this site: <http://animalscience.ucdavis.edu/faculty/mitloehner/publications/>

Theresa Becchetti, Livestock and Natural Resources Advisor

Nitrogen and Almond Growth

Nitrogen is the most important element we can apply to our tree fruit crops. Almond growth and productivity depend on the availability and uptake of nitrogen. Most fertilizer recommendations are based on making nitrogen available to our trees so that a nitrogen shortage does not limit tree growth or productivity. Young almond trees don't require as much nitrogen as older trees. I like UC Farm Advisor Emeritus Wilbur Reil's rule of "one ounce of actual nitrogen per year of tree age for the first five years." That rate can be applied several times per season, but never more than that at any one application. Thus, a first leaf (first year in your orchard) almond tree should not receive more than one ounce of actual nitrogen in any single application. A five-year-old almond tree should not receive more than five ounces of actual nitrogen in any single application. The University of California recommends only one ounce of actual nitrogen per one-year-old tree over the course of the season, but I have been told by many growers and PCAs that this rate is not enough for the growth they desire. So, if you must put out five ounces of actual nitrogen per one-year-old tree, do so in five applications and not all at once!

I have seen many trees burned by nitrogen, especially if liquid fertilizers like UN-32 (urea ammonium nitrate 32 %) or CAN 17 (a clear solution of calcium nitrate and ammonium nitrate) are used in single applications. These liquid fertilizers are very effective and easy to use but it doesn't take much to burn young trees. I do not recommend using liquid fertilizers on first leaf trees—I prefer to see triple 15 (15% nitrogen - 15%

phosphorous - 15 % potassium) fertilizers used on first leaf trees. I like to see granular fertilizers placed at least 18 inches away from the trunk. With micro-sprinkler and drip irrigation systems liquid nitrogen fertilizers can be used very efficiently and easily by growers. But be careful, I know several farm managers that will not allow more than 10 gallons of UN-32 per acre per application on mature almond trees. UN-32 contains 3.54 pounds of actual nitrogen per gallon, so if you put out 10 gallons of UN-32 per acre you have added 35.4 lbs of nitrogen per acre. If you have 120 trees per acre and do the math you come up with 4.72 ounces of actual nitrogen per tree—almost 5 ounces! I recommend not applying higher rates than this per application. I have seen nitrogen burn occur more often during hot summer temperatures when trees have elevated transpiration rates and obviously faster nitrogen uptake rates than what would have occurred at a cooler time of the year.

Nitrogen usage should be based on an individual orchard's cropping history (previous yields) and leaf and water analysis to determine nitrogen availability and potential sources. Some groundwater has elevated nitrogen levels that should be accounted for. See our nitrogen usage chapter 27 in our UC Almond Production Manual #3364 and the interactive "Nitrogen Fertilization Recommendation for Almond" model by Dr. Patrick Brown, UC Davis, at <http://fruitsandnuts.ucdavis.edu>. This model can be used to calculate both the timing and rate of fertilizer applications required to maintain optimum yield. Site-specific information is required in order to accurately project the nitrogen requirement for orchards.

If you determine that your orchard needs 200 pounds of nitrogen per acre per year, I would prefer to see you add 10 pounds of actual nitrogen in 20 irrigations over the course of the season, rather than applying it all at once or even in two split applications. I know many growers that "spoon feed" their trees with injections of nitrogen and other liquid fertilizers into their irrigation systems and they seem quite pleased with their fertilizer efficiency. Mature trees need more nitrogen in early spring during periods of active shoot growth, leaf activity, and photosynthesis. Thus, dormant winter applications of nitrogen should be avoided!

If you haven't applied potassium to your soil in either a band in the fall or through your irrigation system, you can use foliar applications to correct a short-term deficiency. Joe Connell, UC Farm Advisor in Butte County, nicely summarized previous research in which 10 pounds of potassium nitrate was mixed with 100 gallons of water and sprayed at 400 gallons per acre. These dilute, high-volume sprays were applied three times at one-week to 10-day intervals until approximately 120 pounds of potassium nitrate per acre was applied (40 lbs per application). If you only apply 10 pounds per 100 gallons in three 100-gallon concentrate sprays you are only applying 30 pounds of potassium nitrate per acre, and Joe warns that you shouldn't expect to see fantastic results with this rate. I know many growers that also spray potassium nitrate for mite control. Potassium nitrate can be safely applied at 20 to 30 pounds per acre in 100 gallons of water.

Good Luck!!!

Brent Holtz, County Director and Pomology Advisor

