



# FIELD NOTES

A QUARTERLY PUBLICATION OF COOPERATIVE EXTENSION

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## Potassium Requirements for Tomatoes

This season and last it seems I've observed more tomato fields exhibiting symptoms of potassium (K) deficiency. This may reflect the current high price of potassium fertilizers, but perhaps also the increasing trend towards continuous tomato cultivation. Potassium is important for vegetative growth, as well as fruit yield and quality. Although K status can have some impact on soluble solids or blended color, it can have a significant influence on color uniformity, with deficiencies sometimes resulting in 'yellow shoulder' or 'internal white-tissue'; rendering fruit unsuitable for peeling or dicing. Foliar symptoms of deficiency include necrotic spots on leaves, marginal leaf necrosis, leaf curling, and premature drying and death of the foliage.

### POTASSIUM UPTAKE

Potassium uptake peaks at a rate of around 50 lbs K<sub>2</sub>O per acre per week around 10 to 11 weeks after transplanting. Fertigation via drip irrigation or water-run applications in furrow-irrigated fields can be useful to supply K during periods of peak demand. Over the course of the season, processing tomatoes will take up 300 to 450 lbs of K<sub>2</sub>O; depending on yield, 250 to 350 pounds of this is removed with the crop. Higher yields obviously result in higher removal rates. If fertilization levels are below that which is removed in the crop, then you are essentially mining K from the soil. Depending on your soil K levels, fertilizing below crop removal rates may not leave sufficient K to supply future crops.

### SOIL SAMPLING

Most soil analytical labs use ammonium acetate extraction to assess soil K content. Using this method, soils with less than 150 ppm extractable K would be considered low in potassium; a yield response would be expected from K fertilization. Between 150 and 250 ppm,

a yield response is considered possible if K is less than 2% of the total cation exchange capacity. Above 250 ppm, no yield response is expected.

Be aware, however, that soil extractable K is a useful but imperfect indicator of K availability to plants. There are more accurate tests for available K, but these are not typically offered. Soil physical characteristics (structure, compaction, aeration, etc), management practices (irrigation method, timing and volume) and the health of the root system all influence root density and

*(Continued on page 2)*



*Potassium deficiency symptoms in tomato (from Epstein and Bloom 2004)*

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function and can also affect K availability to the crop. Soil Mg also has a great influence on crop K uptake. If the K/Mg ratio is too low, color disorders may be difficult to avoid even with K fertilization.

### TISSUE SAMPLING

Because K levels in leaf petioles can change rapidly over a few days and be affected by weather conditions, they are not a reliable measure of crop K status and certainly should not be used after full bloom. Whole leaf sampling is a better measure of overall crop nutrient status. Nutrient levels in whole leaf samples change more slowly than petioles, so it projects farther into the future and can provide useful information at any crop stage. Suggested tissue potassium sufficiency levels for tomatoes are shown in the table below. On a final note, the plant pathologist in me can't help but mention that if the root system or vascular system is damaged by disease (e.g. by corky root, Phytophthora root rot, or Verticillium wilt), then foliar deficiencies may appear even though soil K levels may be adequate.

Sample type	Potassium (K) sufficiency level		
	Early flower	Full bloom	First red fruit
whole leaf	2.2	1.6	0.8
petiole	4.5	3.0	???

Brenna Aegerter  
Vegetable Crops Advisor

## Ranch Water Quality, Small Landowner Short Courses

In conjunction with our local NRCS office, we will be holding a two-day Ranch Water Quality Short Course in late September at the Stanislaus County Ag Center. The short course will cover a variety of topics from ranch planning, mapping, weed control, ways to protect and enhance water quality on your ranch, as well as different funding opportunities available.

**Dates:** September 21<sup>st</sup> and 28<sup>th</sup>, 2009

**Time:** Registration at 8:30 am on the 21<sup>st</sup>, meeting from 9:00 am to 3:30 pm.

**Place:** Stanislaus Ag Center, Harvest Hall Rms A, B, & C  
**Registration Fee:** \$25, includes program, lunch and snacks both days as well as ranch maps.

**To register:** Contact Theresa Becchetti in the Modesto office by September 11<sup>th</sup>. Have available all the parcel numbers for the ranch maps.

### SMALL LANDOWNER SHORT COURSE

This is a half-day program designed for landowners with less than 10 acres and specifically geared to horse owners. Information will cover a variety of topics including pasture management, fencing and corral options, nutrition, and water quality concerns. This will again be presented in cooperation with our local NRCS office, and the date set is September 18<sup>th</sup> in the Escalon/Oakdale area. If you are interested please call me at the Modesto office with your information to ensure you receive notification. And if you have neighbors or friends who may be interested, please pass along the information.



Smutgrass. Photo by T. Fuller, CDFA

### SMUTGRASS – ANOTHER INVASIVE GRASS...

Irrigated pastures are important forage bases in our area. Unfortunately they are now being invaded by a perennial grass that is not palatable to livestock, creating a decrease in carrying capacity. The Sacramento Valley has had smutgrass in their pastures for a little while now, long enough to start to work on strategies to combat it. I have found a few pastures in our area that also have smutgrass. Right now we have very limited amounts of it in the northern San Joaquin Valley, and it would be nice if we could get rid of it completely. Smutgrass derives its name from the black fungus on the seed heads that should be emerging right now. If you think you may have it, please let me know. I will try to work with everyone to make sure we have the most current information to control and eliminate, if possible, smutgrass before it takes over our irrigated pastures. Cooperative Extension is trying some different control methods at the Sierra Field Station by Marysville. I will keep you informed of their progress as they move forward.

Theresa Becchetti  
Livestock & Natural Resources Advisor

## Spotted Wing Drosophila— A New Pest of Soft Fruits

Since the first detections and reports of damage to central coastal caneberries, strawberries and blueberries in late 2008, the spotted wing drosophila (SWD) has been found in many central and northern California counties attacking cherries and some other soft fruits. SWD could easily be found in San Joaquin County cherry orchards this past season, and caused significant damage in many orchards, especially very late in the season. SWD maggots could also easily be found in unpicked fruit several weeks after harvest.

SWD (*Drosophila suzukii*) is similar in size, appearance and biology to *Drosophila melanogaster*, the common vinegar flies found infesting damaged, rotting and over-ripe fruit – with at least two important differences. Unlike *D. melanogaster*, whose male and female adults have clear wings, male SWD have a distinctive black spot near the tip of each wing. A key difference is that SWD can attack undamaged fruit, while *D. melanogaster* only infests rotting or fermenting fruit. Adult SWD females have a large serrated ovipositor used to puncture the skin fruit. Eggs are laid in these holes, and SWD maggots feed on the fruit flesh as they develop. Egg-laying punctures and maggot feeding permit the entry of fruit decay organisms, which quickly destroy the fruit.

Little is known about SWD's host range. Older reports from China, Japan, and – more recently, Hawaii and Spain – include apple, blueberry, grape, peach, persimmon, and plum as hosts. To date, as noted above, it has been found in strawberries, blueberries, caneberries, and (here in San Joaquin County) nectarines. Other fruit crops will likely be added to these lists with time.

Like *D. melanogaster*, SWD has a short life cycle – one to a few weeks under favorable conditions. This means that populations and damage can increase dramatically in a short period of time. Vinegar flies are thought to overwinter as adults, but this had not been confirmed under California conditions. Winter cold is not limiting to survival in places like China and northern Japan where SWD is well established. Because successive generations of flies must shift from host to host as they mature and ripen, and SWD adults die rapidly without moisture, there is some hope that the crop diversity and hot dry climate of the Central Valley may help make it relatively inhospitable to SWD. Only time will tell.

Relatively little is known about monitoring or managing SWD. Researchers and PCAs have found that liquid fly

traps, such as the Rescue Fly Trap, baited with apple cider vinegar are attractive to SWD and can be used to monitor for the presence of SWD in vineyards and orchards. These traps also capture *D. melanogaster*, but the black wing spots on SWD males can be used to distinguish them. If trapping indicates that SWD is present, monitor carefully for egg-laying punctures and larval damage to fruit. Experience to date suggests that female SWD generally will not lay eggs in fruit until it is nearly ripe. But, once fruit are susceptible and egg-laying begins, a large percentage of fruit can become infested in a very short period of time.

We will need more time and research to find the best ways of controlling SWD. In limited small scale trials in coastal caneberries, the bait+insecticide product GF-120 Naturalyte® (Dow AgroSciences LLC) gave some suppression of adult SWD populations. Other insecticides or bait+insecticide combinations may also prove effective in future tests. Given SWD's short life cycle, mobility, and apparent egg-laying preference for ripe fruit, it seems likely that control programs will need to be focused reducing adult populations, especially late in the pre-ripening period of the specific crop being treated. Experience with central coastal infestations also suggests that SWD control requires a "group effort" in the sense that a single poorly managed field or orchard may serve as a source of infestation for susceptible crops nearby.

More information on SWD can be found online at <http://www.ipm.ucdavis.edu/EXOTIC/drosophila.html>

Joe Grant,  
Pomology Farm Advisor



Except for a distinctive black spot near the tips of each wing on adult males, SWD are very similar in size and coloration to common vinegar flies found infesting rotting or fermenting fruit.

## Productivity, Excellence and Giftedness

Over the last week I have had a very stimulating conversation with a renowned physician and pathologist, Oliver Stanton, and Anders Ericsson, author of the *Harvard Business Review* (HBR) paper, "The making of an Expert."<sup>1</sup> The HBR article centers on the old question, "Are gifted people—or those who succeed in a field—born or made?" This has been the question that farm employers have asked over the years. "Can I," they ask, "train my weaker employees by putting them alongside the best to bring them up to the level of these outstanding employees?" Anders Ericsson et al. suggest that indeed there are differences in giftedness, but that for the most part experts and gifted performers are made, not born. In their paper they introduce three concepts that I wish to share here: 1) the importance of *deliberate practice*, 2) the avoidance of *creeping intuition* and 3) the value of providing *excellent coaches*.

Anders has found that behind excellence there is almost always a lot of practice. He uses the expression *deliberate practice* because it is one thing to rehearse what one has already conquered, but deliberate practice involves working on those areas that do not come so effortlessly. For those truly seeking to excel, the paper recommends two hours per day of such focused practice. Many incorrectly come to think that these gifts just fall into people's laps. One sportsman explained that people perceive him as a natural golfer, but what they do not see are the endless hours of practice that often yielded bloody hands. Many interesting examples are given from the fields of sport, literature, music and chess. Practice is especially productive under the eyes of the right coach, they argue persuasively. I would add that deliberate practice through introspection and self-learning is an important complement to having an excellent coach.

The second concept, creeping intuition, is the refusal of those who excel to automatically classify new information as something they have already seen before. Individuals who avoid the creeping intuition trap do not allow themselves to think they have already learned what there is to learn. Such successful individuals are constantly trying to improve and think of new possibilities. They do not fall into a rut.

Let us return to the question, "Are gifted people born or made? Is it enough for farm workers—and others in agriculture—to get the right training? Without a doubt, better and more focused training will be of great help. Three decades ago I worked with a number of Junior Colleges and helped them introduce welding and mechanics training for farm workers. We used an individualized training

method which permitted participants to learn and progress at their own pace and become so outstanding—despite their limited formal education—that one of the long time college instructors declared that these workers as a whole had outperformed his previous students. I have been conducting quality control studies along with a number of colleagues in Chile. The results will permit us to help individuals to focus, through deliberate practice, on the type of plant or fruit defects that are difficult to identify—at both the group and individual level. These same principles may be applied in dairy and other animal operations. In addition, I have been conducting other studies on perfecting piece-rate pay for crew workers, so they will be motivated to perform to their maximum capabilities.

My own perspective on the topic of giftedness, productivity and excellence goes along these lines: There are great differences in individual productivity at the farm and these follow a normal distribution curve. My studies show that the best crew worker is typically capable of working 4 to 8 times faster than the worst in the same crew. Oliver Stanton shared data with me from his own pathology lab that confirms these numbers outside of agriculture. Differences in capability and productivity include ability to discern issues of quality, not just faster work. I am a great believer in *job sample* tests for all applicants, from veterinarians, to nutritionists, from farm managers to crew leaders, from irrigators to farm workers. Each one of these jobs requires a different subset of skills which can be tested before the individuals are hired or placed into a particular position.

The S Curve is often used to explain how people learn. The beginning of the S is flat, followed by a steep line and culminating once again with a flat line. At first the learning is slow, then it accelerates, and finally the learning tapers off again. It is helpful to think of a number of connected S Curves, one on top of another. A breakthrough is another word for saying that a person moved from one S Curve to the next.

Some tasks are simple enough that the basic S Curve may take a few minutes to conquer. Farm foremen tell me, that for the most part, three days are sufficient to see if inexperienced pickers and pruners will master these skills and work above a set standard. This is not to say they stop learning after three days. One gifted worker explained that while he is pruning a vine he already is making pruning decisions for the next. There are other agricultural jobs that require months, years or decades to truly master. Many jobs, such as learning to be a truly effective manager, are complex enough that a lifetime is not sufficient to master the necessary skills.

I like the formula:

Productivity = Ability x Motivation

By productivity (or excellence) I mean a combination of speed, quality, and discernment. Ability is what a person can do. Motivation is what a person will do. If either ability or motivation comes close to zero, then productivity will be lacking. If motivation is very low, it matters little how much potential a person may have. You probably know people who have extraordinary aptitude but their lives have not amounted to much (in terms of developing these talents). If talent in an area is very low, it matters little how much motivation and desire they have to improve. I like to use myself as an example here. I would love to be able to sing well but I joke that I got rich because people paid me not to sing.

I have come to the conclusion that each one of us is born with specific inherent potential gifts. In order for these gifts to flourish we must be exposed to the appropriate activity. I hate to think of what would have happened if Johann Sebastian Bach had not been born to the home and epoch that he was born to. I wonder how many people have hidden talents that are just as powerful but go undiscovered or, worse, do not surface from lack of deliberate practice. Some may give up too soon, supposing that if they were really good at something success would be quickly manifested. Other factors also come into play, of course, such as availability of an appropriate coach or limited time to spend on developing talents. I suspect that lack of deliberate practice is a much more serious setback than a lack of inherent gifts. Relatively few people seem committed enough to wish to tackle learning that requires extensive dedication. Once we choose an area or field to improve in, however, I feel each one of us has a different inherent potential in terms of how far we can succeed.

Many skills, abilities and gifts can be measured over time and have been shown to be quite a constant. This is true of IQ tests and it is also true of pruning tests. I have given brief pruning tests (46 minutes) to farm workers at the beginning of the season. Then, I have compared the test results to their on-the-job performance and obtained very high correlation coefficients (thus showing that the test was predictive of on-the-job performance). I would expect that for tasks that require a relatively short learning curve, each person has an upper potential limit. Once a person reaches close to their top performance, additional improvement requires much more effort.. Theoretical upper limits exist for almost any activity we are interested in perfecting. say theoretical, as some activities or jobs—such as a farm manager—would require more than a lifetime to perfect. These upper limits are more artificial and self imposed. As a result we are nowhere close to hitting our potential upper limit. We can easily continue to make huge improvements throughout our lives, regardless of our inherent

management abilities. Of course, someone with more inherent management skills, who is also willing to dedicate the necessary effort, will simply improve faster. We cannot downplay the role of inherent ability.

Farm employers often tell me, “Give me someone with the right attitude over someone with a lot of skill.” I contend that this is not an either / or proposition. I say, “Give me a person with the right attitude—a passion for learning—who also has inherent talent.”

Yes, providing the gifted and outstanding pruner to coach his or her co-workers has the potential to help the rest of the crew. Even with the best help, if the crew workers are paid using a properly designed piece-rate pay, the worst pruner is unlikely to ever prune half the speed of the fastest one. A validated job sample test is an excellent investment because it helps us detect and hire people who are good for the job and reject those who would have failed at the same. True, even a valid test is not perfect—although it beats the interview everyday—in that 1) a few will excel on the test yet do poorly on the job, and 2) a few that failed the test would have excelled on the job. So for me, the answer to the question, “Are gifted people born or made?” has to be a resounding, *it takes both*.

Now it is your turn to give me your opinions.

Gregorio Billikopf  
Area Farm Advisor, Labor Management

1 Anders Ericsson, Michael J. Prietula, and Edward T. Cokely, July-August 2007. Ericsson is also the editor of the book *Development of Professional Expertise: Toward Measurement of Expert Performance and Design of Optimal Learning Environments* (Cambridge University Press, 576 pp, 2009).



## Crop Digest

### August-September 2009

#### GRAPES

A third dry year has challenged most all growers this season with low soil moisture after below average rainfall. Fortunately the early May rain helped mitigate the dry conditions. There have been lots of windy days, but moderate temperatures until mid July. Overall vine growth has been good, but there have been more signs of stressed vines in the last month before harvest. The crop looks to be average at best, but some varieties and some sites have above average crop loads. Veraison once again began with color and berry softening around Independence Day, which is fairly typical.

The demand for Cabernet Sauvignon is improved and for many other varieties such as Chardonnay, Pinot gris, Pinot noir, and Sauvignon blanc, among others, is good. Even Merlot after a fair amount of removals and grafting is better situated in the overall market. The problem is that the general economy is down and affects everyone, although local growers are still in a relatively good position compared to many areas of the state.

After the dry and mild spring, hot temperatures finally arrived in late July and vine stress was evident from yellow basal leaves, some berry shrivel, vine dieback, and general vine stress even with "good" or above average irrigation sets. It seems to be related to water stress, as portions of the root zone dried out with no deep moisture. Soil conditions just seemed too dry to get water fast enough to parts of some vines under deficit irrigation or on shallow soils, especially with Syrah and Zinfandel destined for red wine. The same type of general symptoms occurred in 2003 and 2004, and the last two years in 2007 and 2008 with below average rainfall. Total rainfall ended up about 85% of average for the 2009 season.

Harvest appears on a relatively average schedule. Vines that were a few days behind average seemed to catch up, then were possibly set back just slightly with extreme heat from July 14<sup>th</sup> to 20<sup>th</sup>. With normal conditions, harvest should be about on an average start date in early August. Powdery mildew pressure has been light and only a few problems seem to be of limited concern. Insect pests and spider mite pressure appears to be average or light.

Newly arrived pests have become of more concern. Vine mealy bug is still spreading through the county, so be aware of any new infestations, often indicated by sooty (black) mold or excessive honeydew in clusters, spurs or cordons. A high degree of ant activity in and around vines can also indicate problem spots. Good places to focus on a first look are where birds tend to perch or roost. The light brown apple moth (LBAM), originally from Australia and a resident of Hawaii for many years is now in California, and has been found in the Manteca area of the county. It is very similar to omnivorous leaf roller; somewhat in appearance, also in the number of host crops, and definitely in damage. The Ag Commissioner staff is working hard to monitor both of these threats. Learn more about LBAM at <http://www.ipm.ucdavis.edu/EXOTIC/lightbrownapplemoth.html>

In addition, a new pest caused problems in cherries this year, the spotted wing drosophila (SWD), *Drosophila suzukii*. It is closely related to the vinegar fruit fly *Drosophila melanogaster* which has always been with us and is familiar to many from high school and college biology classes. The SWD is a concern because it can attack sound ripe fruit and has caused problems throughout the state in cherries, strawberries, raspberries and even blueberries and peaches. The situation is being monitored and an effort is being started statewide to prepare for and manage this pest. See article on page 3 for more information. We don't know what other crops it may attack locally. If you see problems in your vineyard of bunch rot and vinegar flies call our office (209) 953-6100 or the Ag Commissioner (209) 953-6000 for more details. It is not a quarantined pest at this time, for complicated reasons, but needs to be followed.

This year a smaller grape crop may be difficult for individual growers as costs and regulations continue to increase, but it may set the stage for better prices and good quality.

Budget cuts have affected our office, in that we lost two secretaries and a significant amount of travel support. We as an office will do our best to answer calls and provide information or resources as best we can.

Paul S. Verdegaal  
Farm Advisor

## Key Points for Growing a Healthy Lawn

This is a summary of the UC Guide to Healthy Lawns. You will be able to find more information on how to grow your specific grass type by going to the following link: <http://www.ipm.ucdavis.edu/TOOLS/TURF/>

### KNOW YOUR GRASS TYPE

This is the first key point. Most lawn turfgrasses in San Joaquin County are usually a tall fescue/ blend with another variety (cool season grass), or hybrid bermudagrass (warm season grass). Cool season grasses will grow actively during spring and fall months and warm season grasses will grow vigorously in summer months. You can find an identification key at the UC Guide link provided above. Once you know what type of grass you have, timing for maintenance with mowing and fertilizing can be determined.

### HOW TO MOW

Direction of mowing is important for grass will tend to grow in the direction the grass blades are mowed. When you see your neighbor mowing in different directions every time they mow, this method actually helps prevent the washboard effect. Do not mow shortly after a lawn has been watered or the clippings can stick to the mower blades and clog the mower. Also, wet clay soils will become compacted if mowed when wet.

### WHEN TO MOW

Mow regularly (around once a week) when the grass is *actively* growing. (spring/fall for fescue, summer for bermudagrass). You should be able to mow less than every two to 3 weeks when the grass is not actively growing. If you are mowing every week throughout the year, you could be adding too much water and/or fertilizer. With each mowing, you should remove only 1/3 of the grass blades. For tall fescue, the mower should be set to 1 ½ to 3 inches and you should mow when the fescue reaches 2 ¼ to 4 ½ inches. For bermudagrass, mowing depends on if the grass is seeded bermuda or hybrid bermuda sod. For seeded bermudagrass, mow when the turf reaches 1 ½ – 2 ½ inches tall, with mowers set at 1- 1 1/2 inches. You can mow hybrid bermuda shorter, with mowers set at ½-1 inch and mowing at ¾ - 1 ½ inch.

### WHEN TO FERTILIZE

For Tall fescue – You want to fertilize when the grass starts to actively grow. In March and May use around one lb of nitrogen per 1000 sq ft. Ammonium sulfate is recommended for most loams to clay soils, to get one lb of nitrogen from ammonium sulfate use 4.8 lbs fertilizer.



UC Statewide IPM Program  
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If you have a sandy soil, consider using ammonium nitrate and applying the fertilizer in smaller, more frequent applications (1/2 rates, in March, April, May and June). Only use a complete fertilizer in the fall months of September and October. Recommended complete fertilizer is a NPK of 28-3-3. Fertilizer timing for bermudagrass is the opposite in terms of fertilizer. You want to put a complete fertilizer down in May and June, and then add only nitrogen in September and October. The last fertilizer application should be done 6- 8 weeks before expected frost (usually around the week of Thanksgiving), around the first or second week of October. Weed-n-feed type fertilizers are not recommended for areas close to tree roots.

### WANT A SUSTAINABLE LAWN?

Many agriculture farms are moving towards a sustainable operation, one that considers how to maintain a healthy soil that can produce healthy plants for centuries. Landscapers and homeowners can move towards sustainable as well, without sacrificing the yields of a beautiful landscape.

For transitioning your lawn to be sustainable, the main goal is promoting a healthy soil profile for your turfgrass. The start to a sustainable turfgrass soil is promoting oxygen and growth of beneficial organisms by punching out plugs of grass/soil (called aerification) and preventing compaction, adding soil amendments back into the soil, preventing thatch building up, and adding as little fertilizer or pesticides as possible. I will be writing a full article on *Sustainable Lawn Care* in the fall newsletter edition of *Blooming News*. If you are interested in receiving *Blooming News*, you can subscribe to it free online at: <http://groups.ucanr.org/sjceh/>

Ashley Basinger  
Environmental Horticulture Advisor

## Is Dairy Production Today More Environmentally Friendly Than 50 Years Ago?

The short answer is yes. A 2009 Cornell University study compared environmental impacts of historical production practices with those of modern day dairying. In 1944, dairies were low-input, pasture based systems. Dairy animals were predominantly small-breed, and most, if not all breeding was accomplished through natural service. In sharp contrast, the dairy industry in 2007 is characterized by large breed animals, high-input, and TMR based feeding systems. Approximately 70% of breeding is done through artificial insemination (AI), allowing for greater genetic improvement.

While many opponents of modern dairying look at the environmental impacts on a per cow basis, this way of thinking does not accurately represent the differences. Low input systems will yield low outputs in both milk production and waste. A high yielding animal will undoubtedly require higher inputs and subsequently create more waste. Therefore, dairy production systems should not be compared on an animal basis, but rather on unit of milk production. Efficiency is the key!

The number of animals and milk production of the two representative years is presented in the table below. In 2007, there were 16.4 million less dairy animals producing 68.6 billion more pounds (lbs) of milk than in 1944. Clearly, genetics and the way we feed and treat our animals are reflected in the more than four-fold increase in yield per cow.

	1944	2007
<b># of cows (millions)</b>	25.6	9.2
<b>Milk production (billion lbs)</b>	116.6	185.2
<b>Yield per Cow (lbs/year)</b>	4,563	20,225

To produce one billion pounds of milk, today's dairy industry requires a fraction of the inputs needed in 1944. Further, waste outputs per billion pounds of milk are reduced in the 2007 model.

### Dairying today requires:

- 21% of the animals
- 23% of feedstuffs
- 35% of water and
- 10% of the land

### Dairying today produces only:

- 24% of the manure
- 43% of CH<sub>4</sub> and
- 56% of N<sub>2</sub>O

Today's farmers are more efficient at producing a high-quality, wholesome product to an ever growing number of consumers.

Reference: Capper, J. L., et al. The Environmental Impact of Dairy Production: 1944 compared with 2007. Journal of Animal Science 2009. 87:2160-2167

Jennifer Heguy  
Dairy Farm Advisor



## Calendar of Events

### Growing Olives for Oil

August 24, 2009 10 a.m. until 4 p.m.  
Pre-registration is due by August 19.  
Tuolumne County Ambulance & Fire Administration  
Training Room  
18440 Striker Court, Sonora, CA  
Contact: UCCE Tuolumne County 209-533-5695

### Dairy Cattle Reproductive Short Course

September 17, 2009 9 a.m. until 4 p.m.  
California State University Fresno, Center for  
Irrigation Technology Conference Room  
Contact: Gerald Higginbotham 559-456-7558

### Small Landowners Short Course

Sept 18, 2009  
Time to be determined  
Contact: Theresa Becchetti, 209-525-6800

### Ranch Water Quality Short Course

September 21 & Sept 28, 2009 (two day course)  
Stanislaus County Ag Center, Harvest Hall ABC,  
3800 Cornucopia Way, Modesto, CA  
Contact: Theresa Becchetti, 209-525-6800

### Delta Responsible Landscape Training

(three-day course)  
October 6, 13, & 20, 2009  
Robert J Cabral Agricultural Center  
2101 E. Earhart Avenue, Stockton CA 95206  
Pre-registration is required.  
Open only to landscape industry professionals.  
Contact: Michelle Drummond 209-953-6100

### Landscape Professionals 2009 Fall Workshop Series

November 12, 2009  
"Sustainable Landscaping Workshop" at the  
Robert J Cabral Agricultural Center  
2101 E. Earhart Avenue, Stockton CA  
Contact: Michelle Drummond 209-953-6100  
December 3, 2009  
"Tree Quality Workshop" at  
Hutchins Street Square  
125 South Hutchins Street, Lodi CA  
Contact: Michelle Drummond 209-953-6100

## Jumping Oak Galls on Valley Oaks

This time of year, it is not uncommon to see the Valley Oak trees (*Quercus lobata*) with their leaves yellowed and splotchy with numerous small seed like balls on the underside. These are called Jumping Oak Galls and they are made by a small Cynipid wasp larva (*Neuropteris saltatorius*) that is developing inside the gall. Don't worry-the wasp doesn't sting humans. In fact, you would be lucky to actually see the critter. While the galls do cause some defoliation, they are not particularly harmful to the trees. They may cause some serious leaf loss in some years and this year seems to be one of those years. The adult female wasp, in order to be able to create a gall that contains an egg, must sting the leaf at precisely the right time. If the leaves are too fully expanded and hardened off, the galls will not form. That is why you might see one tree with millions of these galls and yet the one nearby might not have any. Their foliation times may be somewhat different. There are many types of oak galls including those that look like chocolate kisses and some that look like apples, and still others that look like horned or fuzzy balls. We do not normally recommend any type of control of these insects. However, some research indicates that if one leaves the infested leaves on the ground, the parasites of these little wasps are not raked away and it may moderate the population over time. As well, there is more "mulch" on the ground around the trees, which is a good thing.

One of the fun things to do with the galls as they are beginning to fall off the tree is to just bring them into the house. As the galls warm, they begin to jump and wiggle around and make a snap crackle and pop noise.

<http://www.ipm.ucdavis.edu/PMG/GARDEN/PLANTS/INVERT/gallmakers.html> (for pictures)

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