



RESEARCH • IPM NEWSLETTER

LWWC Funds New Research into Vine Nutrition

BY CLIFF OHMART LWWC Research/IPM Director

Vine nutrition is always on the minds of winegrape growers. Whether it is a desire to keep vines healthy and producing an optimum yield or wanting to obtain the highest quality possible for any particular vineyard. Over the last several years many Lodi growers and consultants have realized that previous knowledge about optimum vine nutrition and how to assess vine nutrient status is not good enough anymore for judging the nutrient level and managing the nutrition program for the newer rootstocks, varieties and clones. Moreover, the goals of winegrape growing have changed over time. Therefore LWWC's Research Committee placed these topics as the highest priority for newly funded research. Last fall the committee sought out research proposals focused on winegrape nutrition from University of California and California State University soil scientists and viticulturists. After receiving several proposals, having them peer reviewed by other scientists, and the committee members doing their own reviews they voted to fund two projects. One will be carried out by Dr. Robert Wample from the Viticulture and Enology Research Center at California State University Fresno looking at nitrogen management in winegrapes. The second, by Dr. Stuart Pettygrove a Cooperative Extension Soils Specialist at the University of California Davis, will develop soil-specific potassium management programs for Lodi winegrape vineyards. Here is a brief overview of what each project proposes to accomplish based on their research proposals.

Dr. Robert Wample:

Nitrogen Management in Winegrape Vineyards in the Northern Interior Winegrape Region of California

Nitrogen is the nutrient that has received the most attention in the



production of wine grapes. It is an important management tool in the production of quality fruit since it plays not only a role in the vegetative growth but in so many other aspects of metabolism. Too much nitrogen can result in excessive vegetative growth and reduced fruit quality. However, insufficient nitrogen leads to poor vine growth and low nitrogen levels in fruit, which has been linked to slow or stuck fermentations. In addition, insufficient must nitrogen has been associated with formation of reduced sulfur compounds, such as hydrogen sulfide by yeast. Hence, proper nitrogen nutrition of vines is believed to be critical in the production of quality fruit that will ferment quickly and "cleanly". Because it is such an important nutrient and has been the focus of the majority of nutrient studies, it can serve as a "model" for evaluating the procedures and protocol for moni-

toring grapevine nutrition.

Unfortunately, after reviewing the literature it is clear that the methods of monitoring vine nitrogen status, such as petiole analysis at bloom, may not accurately reflect the nitrogen status of the fruit. It has been reported that periods of high rainfall or irrigation prior to the collection of petioles can result in petiole nitrate levels that are 10 to 20 times higher than those collected from the same vineyard under "dry" conditions. It has also been shown that there can be as much as a two-fold difference in petiole nitrate levels between sun and shade leaves collected from the same vine. These results clearly indicate that more attention needs to be given to the sampling procedure and recording the information regarding the environmental factors or management practices that occurred prior to tissue sampling.

The primary goal of this proposal will be to develop a more reliable procedure to monitor nitrogen nutrition of grapevines in California Crush District #11 (Northern Interior Winegrape Region). The specific objectives of this proposal are:

- Establish the effect of sample time (morning, mid-day and afternoon) on petiole and leaf nitrogen status.
- Establish the effect of tissue micro environment (sun vs shade) on petiole and leaf nitrogen status.
- Establish the effect of phenological stage (prebloom, 30 days after full bloom, veraison and postharvest) on petiole and leaf nitrogen status.

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Dr. Stuart Pettygrove:

Soil-specific potassium management in the Lodi winegrape region.

Plant potassium (K) status and therefore K fertilizer requirement are determined by the balance between plant demand for potassium and the capacity of the soil (and root system) to provide that potassium to the above-ground plant and developing fruit. We believe that grapevine demand for K is determined mainly by fruit load. During years of heavy fruit load (2005, for example), K deficiency symptoms were often visible on leaves. The actual fruit load cannot be predicted very far ahead of time, as it is subject to several late-season factors. But the potential fruit load can be predicted based on cluster counts and varietal characteristics. Both the amount of K required by the plant during the season and the timing of that demand must be considered. University of California research has shown that about 75% of K translocated into fruit at the late post-bloom stage is derived from remobilized K – mainly from shoots, stems, and roots; and 25% of the K in fruit is provided directly from the soil.

New nutrient management guidelines are needed for winegrape production in California. The proposed research will take a first step by establishing the validity of a soil-specific approach for managing potassium nutrition in the Lodi-Woodbridge Winegrape region. Rather than providing a region-wide prescription for potassium nutrition, Pettygrove and his coworkers propose a landscape-targeted approach emphasizing major soil landscape relationships to stratify the region into geographic nutrient management templates. Management templates will initially consist of maps repackaged from the USDA-NRCS digital soil survey database depicting the inherent ability of benchmark soil landscapes to fix or release potassium. Field measurements and laboratory analysis will be used to further characterize soil properties and the fate of potassium in each benchmark soil landscape. Geographic nutrient management templates will be constructed from soil maps and combined in a geodatabase

with data from the soil surveys, the grower survey, and field and laboratory measurements. In the future, information used to develop geographic nutrient management templates can be expanded to address a variety of nutrient management strategies and best management practices.

Activities Planned

1. Develop a map of the soils of the Lodi-Woodbridge winegrape region that groups soils according to their potential K supply capacity. The map units will be based on information derived from the digital versions of the Sacramento and San Joaquin County soil surveys and the National Soils Information System.
2. Conduct a survey of grape growers in the district to determine the interrelationships among soil, management practices, and the occurrence of K deficiency or excess. The survey will help us develop our model of winegrape-K relations and will aid us in identifying sites for soil sampling and analysis.
3. Validate the relationship of soil map categories to K supply at 20 to 30 locations by conducting soil profile descriptions and measuring in the laboratory relevant chemical and physical properties, including K fixation potential.
4. Based on the grower survey and characteristics of soil profiles and samples, revise the soil map to more consistently classify soils according to K management strategies.
5. Propose provisional K management strategies specific to soils and production goals that are appropriate for inclusion in the LWWC's Lodi Winegrower's Workbook and for distribution to the Lodi winegrape growers. Results will also be used to identify future research needs.

In summary, both projects are designed to produce important and useable results after the first year while developing a foundation for more long-term research to develop robust tools that LWWC growers can use in their nitrogen and potassium fertility programs.

TTB APPROVES FIRST LODI WINE LABEL WITH LODI RULES LOGO



A very significant milestone was reached in the Lodi Rules for Sustainable Winegrowing program. On July 17th Joe Dexter, owner of Lobo Loco Winery, received approval for the Lodi Rules logo to be displayed on his Lobo Loco 2005 Syrah. The label approval sailed through US Department of Treasury, Alcohol and Tobacco Tax and Trade Bureau (TTB). Displaying the logo signifies the wine is made from Lodi Rules-certified, sustainably-grown winegrapes. Joe is also one of the first six Lodi growers who certified their vineyards under the Lodi Rules program in its inaugural year of

2005. Congratulations to Joe for his ground breaking action paving the way for other wineries making Lodi Appellation wine with Lodi Rules-certified grapes to obtain label approval.

GROWER PROFILE: *Pieter den Hartog*

BY CHRIS STORM

Pieter was born in Amsterdam, Holland in May 1960. He spent much of the next 20 years trying to learn as much about farming as possible, because as Pieter claims he “always knew [he] wanted to farm even from the age of four or five.” As a youngster Pieter traveled to the country outside of Amsterdam to spend weekends at local farms. Once he was older, around age 14, he worked on a farm in England every summer until he was 18. In 1980, he completed a 3 year Ag Management program in Hoofddoorp, the Netherlands.

Back then, Pieter was fascinated with open land farming, so soon after graduating, he departed for America to further his studies with the hands-on aspects of farming. He journeyed over much of America and apprenticed in several open-land farming organizations in Colorado, New Mexico, Texas and California.

While living in California, and realizing that he wanted a farm of his own, Pieter investigated potential properties to purchase in the Orland, Dixon, and Woodland areas before finding the right piece of ground just outside of Thornton. When he first laid eyes on a disheveled farm in 1986, most of the ranch was under water from the massive flooding that year, but something caught his eye and he could envision the potential in the place.

So, in that same year, Pieter with the help of his father purchased the farm creating the Den Hartog family farming operation now known as Den Hartog International Farms, Inc. The original 720 acre farm consisted of 120 acres of pears, but mostly open ground. He spent the next several years re-leveling and reconstructing the ranch to improve the drainage and orientation of the open fields while growing wheat, corn, beans, hay, and onions. In 1991, he began planting winegrapes. From 1991 to 1994 he planted 100-120 acres of winegrapes a year. He also planted 32 acres of cherries in 1992.

During this period of rapid wine-

grape expansion, the pears helped Pieter and his family to maintain the farm. However in 2000, when the pear cooperative Tri-Valley Growers went out of business, Pieter realized the risk of continuing to farm pears and replaced them with more winegrapes and cherries. This quick action showed good foresight, because he was able to acquire contracts just before the grape market softened.

Den Hartog International Farms, Inc. expanded their operation from the original 720 acres to just over 880 acres when in 2002, they bought a dilapidated dairy down the road from his home ranch. The poor condition of the dairy created a challenge but Pieter made quick work of the clean up, reworking and leveling the property and planting winegrapes in less than 12 months.

Pieter requires no other senior management to operate the farm, but relies heavily on his wife Barbara, also with a Dutch background but born and raised in California, who runs the accounting and, harder still, the household. It's a busy household too, with three sons, Kevin age 11, Michael age 14 and Pieter age 16. Like their parents, the three boys are toe-heads and are devoted swimmers and water polo players. When I met Pieter for this interview, he braced a healing black eye from a water polo accident with one of his sons.

When he has time, Pieter enjoys sturgeon fishing on the delta, playing water polo with his sons, watching his sons swim meets and polo games or visiting his parents still living in the same house where he was raised in Holland. And, his other hobby which he is very modest about is photography. A reader with a keen eye will spot his name by an occasional photo of the high school water polo matches in the Lodi News Sentinel.

Pieter manages the farm with 5 permanent employees, all of whom live on the ranch in housing provided by Pieter. He feels that by living in the place they work, they will respect the land and the mission of the farming operation. It has created strong loyalty since most of his employees have been with him for



ACRES FARMED: Winegrapes: 880, Cherries: 46
VARIETIES: Zinfandel, Merlot, Petite Sirah, Chardonnay, Sauvignon blanc, Viognier, Pinot gris, Syrah.

over 12 years and are raising their children right next to his own.

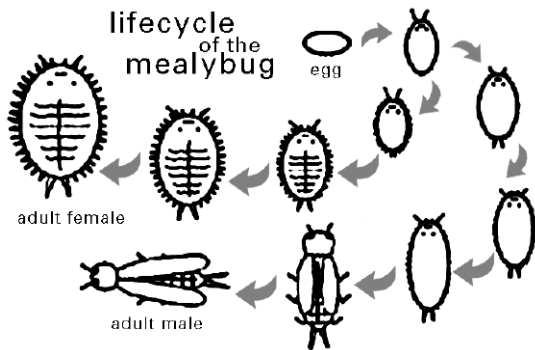
Because his employees live on the farm and to moderate dust, he provides Mules and 4-wheelers for his employees rather than trucks. This not only cuts down on dust by using smaller vehicles, but also trims fuel consumption. In addition, all of the farms alleys and roads are grassed, graveled, or paved. Another advantage to the Mules and 4-wheelers is that he can use them for strip spraying and with the enviro-mist sprayers.

Pieter uses three different trellis types including the quadrilateral, bilateral T-trellis, and VSP. But, as he says “mechanization is the future” and he prefers a trellis that allows him to pre-prune with his Pellanc pre-pruner, like a vertically positioned vineyard. To reduce labor costs he is experimenting with a vertical trellis with fixed catch wires. He hopes that with upright varieties like Sauvignon Blanc, the vines will grow up and attach themselves to the fixed wires saving the cost of lifting the wires. If the system doesn't work, he'll add 6 inch cross arms and go back to a more traditional VSP system.

Pieter considers Lodi winegrapes to be of great quality, affordable and well liked. Pieter explains “the challenge for Lodi grape growers is to produce the high quality demanded by the market with the low prices offered by wineries.” This was a major reason Pieter decided to join the Lodi Rules for Sustainable Winegrowing program enrolling 85 acres of Chardonnay and 28 acres of Merlot both going to Fetzer Winery. He believes the program will get the “local community and world wine community to recognize the work Lodi has done and to recognize the quality wine we can produce” and lead to higher profitability.

IMPORTANT REMINDER – PLEASE READ!!

Several Lodi growers recently decided to send crews, specially trained to spot Vine Mealybug (VMB), through their vineyards to locate any new infestations they did not already know about. They felt that even though they had instructed workers who prune, leaf remove, etc. to keep their eye out for VMB that maybe infestations were being missed because these workers were not focusing on searching for VMB. They were right. The special crews not only found VMB infestations where none were found before, but many more acres were infested than they had thought would be the case. This is an opportunity to remind all Lodi growers and PCAs several important facts related to VMB.



Finding VMB early is essential for minimizing its spread throughout the district

The most effective monitoring is done by specially trained crews and checking an entire vineyard vine by vine can cost as little as \$8.00 per acre

Once an infestation is found you should take all recommended measures to reduce the population to non-detectable levels to minimize spread to other vineyards

Most Lodi PCAs are well versed in what to do about VMB infestations

VMB infestation can increase the cost of farming by as much as \$300 per acre so minimizing spread is critical to saving money

If you have a VMB-infested vineyard it is extremely important that everyone who enters this vineyard knows it is infested so they can take the proper precautions to minimize spread to other vineyards

Having a VMB-infested vineyard is NOT a sign you are a bad farmer, however, not telling people you have VMB in your vineyard IS being a bad farmer

UPCOMING EVENTS:

October 8, 2006: Taste of Lodi

Tickets \$40 in advance or \$50 at the door.

For more information and tickets – www.tasteoflodi.com

November 3, 2006: Wine Integrity Awards Dinner

Lodi Wine & Visitor Center and Wine & Roses.

For more information and tickets - (209) 367-4727

December 2-3, 2006: Winter Wine Wander

Take a break from the hustle and bustle at the mall and enjoy a glass of wine in Lodi Wine Country. Wineries will be decorated for the holidays with great gift ideas for everyone on your list.

Tickets \$25 in advance or \$35 at the door.

For more information and tickets - (209) 367-4727 or www.lodiwine.com

After a wet beginning in March, harvest is now not so far off. Bud break was about three weeks behind normal, but by mid-May bloom was only a few days later than average. Then the hot dry weather arrived and slowed things down. It appears veraison is about 10 to 12 days later than the long term average. Color is beginning to show up in red varieties and the white varieties are beginning to soften, although both seem a little variable at this initial stage. The hot weather started with a brief round in June, but intensified during the July heat wave. A little bit of heat can help ripening, but when temperatures soar above 95 to 100 for a week or more the vines begin to loose ground and even “shut down”.

June was dry and warm compared to 2005; about normal if there is such a thing. A brief hot spell opened the door for the recent July heat wave, which, after 11 days, broke the record of consecutive days over 100 degrees. However, it seems a lot of people have forgotten about 1981 when that summer had 25 days of 100 degrees or higher and 1984 with 30 days! There is a lot of talk about Global Warming and its implications and how much may be our fault. At this point there is only an indication of a slight warming trend, which appears to be more of a long term natural cycle. Recently it has been pointed out that good evidence of the natural cycle aspect is the fact that the polar ice caps are shrinking on Mars during our current “crisis”. However, it was pretty hot; I know I was sweating like a legislator on a district visit. Anyway, it has been hot before and will be hot again during summer in the Valley.

The hot weather does require more irrigation, especially under a regulated deficit irrigation strategy. Besides the costs of pumping, we could see some crop loss due to sunburn or water stress and summer bunch rot can become a

concern, especially in Zinfandel. Unfortunately, not a lot can be done to prevent summer bunch rot other than managing irrigation on a fine line between providing enough water to keep the vines from being excessively stressed and too much water that might cause tight clusters and thin berry skins. The bottom line is moderate vine stress and water inputs.

Even though the extremely hot temperatures are slowing the vines down, harvest may be only a week or 10 days behind average, especially with the generally smaller crop. There have been a lot of yellow basal leaves with this recent hot spell. That may have been hard to avoid unless your vineyard is located on deep soil and/or you started increasing water ahead of the heat spike. And even with that, it may have taken a little luck this year to avoid some early leaf senescence of basal leaves from water stress. Vines will tolerate some leaf loss, up to 20%, if a full and healthy canopy is in place to begin with. Fortunately deep soil moisture was good early on. For the intensity and duration of temperatures, there has been relatively minor loss to sunburn or water stress, but overall yield could be slightly affected by smaller berries and some shrivel or burn.

Insect pests and spider mite pressure appears to be average or light, but there have been a few scattered problems with leafhoppers. There was some powdery mildew before the hot weather, but that seems to be well suppressed now. Vine Mealy bug is still spreading through the county, so it is good to be aware of any new infestations, often indicated by sooty mold or excessive honeydew in clusters, spurs or cordons. A high degree of ant activity in and around vines can also indicate problem spots. Good places to begin looking before harvest are where birds tend to roost.

There has been increased concern about herbicide resistant Horseweed (or Mare’s Tail) and Hairy Fleabane, but two pests that seem to be taking advantage of more general interest in biodiversity (besides tighter budgets) are puncture vine and star thistle. Puncture vine has a good natural control in two species of puncture vine weevil (*Microlarinus* spp.), one that attacks the seed and one the stem. But population levels have plummeted over the past few years because of successful eradication of puncture vines and possibly from some recent road materials having been infested with puncture vine seed. This year I am seeing many roadsides, untended areas and headlands with solid stands of this weed. There is no current county program any longer to provide weevils for distribution. There are some organic sellers of the puncture vine weevils, but they may be sold out. At this point if you are interested in buying a batch of weevils for augmentation you may have to surf the web. The weevils are still present in many areas of the county, but at varying numbers. If there is a patch of puncture vine that doesn’t get traveled through, letting bio-control work may help. Cracking open some of the seed head you may find a small weevil larva. If 40% of the seed head (“stickers”) have a weevil you may be in good shape. But if there is any possible traffic through an infested area, herbicide is needed to prevent further spread.

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

Demand is good and prices may improve slightly for many varieties such as Pinot Grigio, Petite Sirah, Sauvignon Blanc, Zinfandel, and Colombard. Even

HOT WEATHER...
WEED PESTS...
VINE MEALY BUG...
HARVEST APPROACHES...

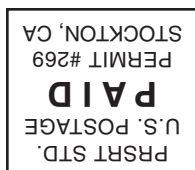
IN THE VINEYARD *continued.*

Chardonnay and Merlot, prices appear to be strengthening as demand seems to be ahead of supply! And of course the newcomer of Pinot nor is being planted and grafted in response to contract offers. The demand for Cabernet Sauvignon and Merlot is still a concern. The crop on a per acre basis appears to be about average to possibly 10 to 15% below average. The smaller crop should help get the harvest off to a start that is not too far from normal. Per acre yields appear to be about average to slightly below, but Syrah is generally light again and Chardonnay along with Zinfandel seem to be taking well deserved rest this year.

More small wineries and more labels along with some tasting medals help everyone get some recognition for all the hard work and risk. For the region as a whole and the Lodi District in particular, recognition is still building in spite of many challenges.

In general things look a little better for harvest this year even with a lighter crop and a scattering of contract losses. Demand is still growing and the lighter crop may set the stage for better prices and good quality. At the same time, besides the extreme temperatures, costs are rising and it may be difficult to cover the increases easily or completely. The good news is winegrowing is still considered in a positive light by the general public, wine consumption is still increasing and agriculture in general is receiving some credit for efforts to comply with new regulations, while contributing to the economy. The weather and the economy will tell how good a year for both quality and returns we may see as harvest unfolds.

Good luck with vintage 2006.



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2545 W. TURNER RD.
LODI, CA 95242

LODI·WOODBIDGE
WINEGRAPE COMMISSION

