



# Compost and Fine Wine

DR. WILLIAM HORWATH Department of Land, Air and Water Resources, University of California, Davis

## *Why compost?*

You do not normally associate fine wine with waste. Compost made from green waste and other organics such as food scraps can make for a valuable addition to vineyards. Compost is a soil amendment that can enhance soil characteristics favorable for vine and root growth. Compost additions can increase microbial activity, add nutrients and enhance physical properties (i.e., lower bulk density and compaction, increase water holding capacity, etc.) of soils. Compost can be an important part of a comprehensive nutrient management plan for vineyard.

## *What is compost?*

Compost is formed through the activity of microorganisms. The composting process takes advantage of microbes that lead double lives. Normally microorganisms live at the same temperatures as us. Some microorganisms can live at both normal and extremely high temperatures. These microorganisms are called facultative thermophiles and are able to tolerate the hot conditions necessary to perform the composting process. Heating in a compost pile can reach 170° F, enough to seriously burn an unsuspecting curious hand. The heating in a compost pile is a valuable process that reduces or eliminates pathogens and weed seeds. Heating in a compost pile is achieved by turning the pile regularly to aerate the substrate, which in turn maintains microbial activity. In nature, composting is rare and only utilized by a few organisms. The crocodilians for example heap rotting vegetation into a pile to maintain a precise temperature to incubate their eggs. A colder compost process (maximum heating of 85° F) accomplished by worms is called vermiculture. Vermicompost generally has higher available nitrogen and

availability. Its use in vineyards is limited because of cost but could be used as a supplement with yard waste compost or other comprehensive nutrient management programs.

## *Ingredients of compost*

Compost can be made from any organic waste. Composts based on yard wastes are commonly used in vineyards. Adding a nitrogen/nutrient rich waste like manure, food scraps from cafeterias or food processing waste to yard waste can increase the nutrient value of the compost. Vineyards and wine making operations may consider making their own compost using pomace. It's a waste management strategy that produces a valuable end product. Pomace can serve as the only feedstock, but mixing yard wastes, animal bedding, or manure can make for higher quality compost. In Lodi, dairies may provide a source of manure and bedding to increase the quality of pomace compost. The additional ingredients act to buffer the compost pH. If pomace is the only ingredient, lime can be added to raise the pH.

## *Compost use in vineyards*

In vineyards, compost additions are done mainly to enhance existing soil properties. In soils with high clay contents, compost additions can avoid soil crust formation and thus enhance the efficiency of drip emitters. In sandy soils, compost adds structure and water holding capacity. There have also been claims of disease suppression in vines, however substantiated reports on disease suppression are few and often conflicting. Typical compost application rates range from 10 to 20 tons/acre when establishing vineyard. When determining an application rate, growers should consider soil



TURNING A COMPOST WINDROW AT  
A COMPOSTING OPERATION

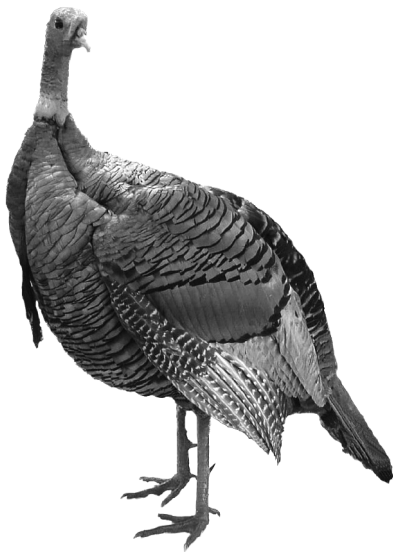
photo source: <http://organic.tfrec.wsu.edu/compost/ImagesWeb/CompSys.html>

analysis results and consult with a local viticulture advisor. To maintain favorable soil characteristics, especially in soils heavy in clay or sand, three to five tons per acre of compost can be added every 2 to 4 years. Composts can also be applied as a mulch to promote percolation, reduce weeds and conserve water by reducing evapotranspiration from the soil. However, compost can also be damaging to grape vines especially when it is immature. Composts quality is often rated by its nutrient content and age. For example, the C to N ratio of composts is dependent on compost age and materials used to create the compost. A narrow C to N ratio around 14 indicates a "mature" compost. It may also indicate the use of high nitrogen containing substrates such as food waste or manure to make the compost. Mature composts should have small amounts of available N with the majority in a stable form not readily available to plants. The nitrogen in compost is initially bound in an organic form and not readily available to plants. The slow release of nitrogen makes compost an ideal soil amendment for the low nitrogen demands of grapes. The nitrogen is constantly mineralized over time and steadily becomes available to the vine especially over one or more years after its application. Composts can be significant

source of other macronutrients such as potassium and phosphorus. Too much compost can lead to excessive growth in vines resulting in problems with canopy management, diseases, reduced fruiting and increased cold injury. Excessive or too frequent compost additions may increase soil salinity. Once compost is applied to the vineyard floor or incorporated into soil, it is difficult to undo the effect either good or bad. Growers must weigh the pros and cons of compost application and use it to their best advantage in the vineyard without causing long-term problems. Soils with good structure and fertility benefit less or not at all from compost additions. So it's important to know your soil before adding large quantities of compost.

#### *Nutrient management philosophy*

Vineyard sustainability is not dependent on fertilizer and other inputs. Soil characteristics such as texture, drainage, fertility status and climate control the capacity of the soil to produce grapes. Compost amendments where required can be an effective amendment to enhance existing soil quality and its sustainability.



## *Are Turkeys a Problem in Your Vineyard?*

The University of California at Davis is conducting a study on the status and control of wild turkeys in vineyards. As part of the study, they want to know whether you've encountered turkeys eating your grapes. Whether you have or not, please take a moment to respond to their brief online questionnaire. It only takes a few minutes! Your responses will help them to research ways of reducing damage caused by these big birds. Go to the following website to fill out the questionnaire:  
<https://ucce.ucdavis.edu/survey/survey.cfm?surveynumber=1960>

## CALENDAR OF EVENTS

**November 20, 2007** 9:00am – 10:30am. Leafroll virus and Lodi vineyards. Dr. Deborah Golino, Director Foundation Plant Services, University of California Davis. Dr. Golino will present the latest information on Leafroll virus and present the latest information on its rate of spread within and between vineyards and how this relates to Lodi vineyard management.

**November 29, 2007** 9:00am – 5:15pm. HR in Wine and Agriculture. The Lodge at Sonoma, Sonoma. \$370.00. For more information see [www.nchra.org](http://www.nchra.org) or call (415) 291-1992.

**January 29-31, 2008** Unified Wine & Grape Symposium, Sacramento. See [www.unifiedsymposium.org](http://www.unifiedsymposium.org) for more information.



## IN THE VINEYARD

BY PAUL S. VERDEGAAL

University of California  
Cooperative Extension Farm Advisor

The 2007 harvest ends a year of some improvement amid the ongoing concerns of supply and demand, production costs, increased regulations and invasive species. The crop appears to be light and of very good quality, but there may be some variability by site and for blocks harvested after the mid-September cool down when a lot of vines seemed to “stall”. Both lower yields and generally very good quality should help the industry, if not all growers. Consolidation continues at all levels and with that everything from \$1800 a ton Zinfandel to \$100 a ton Merlot is found.

The big oversupply that began in 2005 is disappearing and the general quality of local wines continues to improve and to impress more people. The smaller crop allowed wineries to adjust tank space and take deliveries in a well paced schedule. The 2007 vintage holds a good potential for wine quality and further recognition of the Lodi district, but competition for selling that wine will be tough. The challenge continues to not only maintain quality, but increase it, as production costs continue to increase.

The vintage started early, but not much earlier than the long term average has been since 1970s. What was surprising was how fast early varieties came to maturity, while mid season and late varieties seemed to stall in early September and dragged on to a slow finish mid-October. There was a flurry of activity after the October 10th rain of about 0.4 inch (plus or minus across the district). Across varieties, sugars were high; rot incidence low,

acid levels and pH good, colors excellent, but fruit flavors a little slow in developing this year. There was some evidence of berry shrivel, maybe in part due to dry soil conditions, a hot spell in early September and nutrient imbalances. Berry shrivel disorder is being investigated statewide, but a good explanation is still elusive. The occurrence may be from environmental conditions, nutrient based, possibly a genetic predisposition and/or an unknown vascular disease. Or it might be a combination of all the above. Although a little more prevalent in recent years, maybe in part because of hang time strategies. Berry shrivel was very evident in 1999 and then seemed to be less of a problem during the last two wet springs in 2005 and 2006.

The 2007 season has been an interesting and challenging mix. A dry winter and extremely cold January was followed by a mild and dry spring. Temperatures were mild and pests including insects, disease and even weeds were moderate to low. Gophers and voles (field mice) were two pests that were more prevalent this year. Their populations seem to cycle every few years and this was one. Both pests will remain somewhat active during the winter depending on temperatures and soil moisture and they may require control in addition to owl boxes. Be aware that lots of grass or weeds in the vine row of young vines provide cover and encourage vine damage.

Unlike the 2006 season soil moisture this year was lacking and resulted in smaller canopies compared to the last two

years. Good growing conditions and an excellent bloom period helped mitigate slightly the very light set and smaller clusters. Some varieties were not affected much in set such as Chardonnay, Cabernet Sauvignon, and Petite Sirah, while old vines of Zinfandel were severely affected. In between the extremes there was a lot of variability by variety and site. Although there is no easy explanation the cold dry winter didn't help, especially after two very good crop years. In general berry size was relatively smaller and clusters more loosely developed. Rot was not a problem almost across the board; one exception has been Arneis, a white Italian variety that seems to have some rot even this year. Fortunately not much is planted commercially. Later varieties and blocks harvested after the mid September cool down are showing more breakdown problems as the season finishes.

Overall production problems have not been bad, but as in 2005, Vine Mealy Bug (VMB) continues to find its way around the district. Be aware of the possibility of VMB popping up and keeping a watchful eye open to sooty mold on vines or fruit to telltale signs of VMB infestations. Any incidence of high ant activity should be investigated and also check vineyards near bird roosting sites as a place to look first. Information is available at the LWWC office, our office and online at [ipm.ucdavis.edu](http://ipm.ucdavis.edu) or [vinemealybug.uckac.edu](http://vinemealybug.uckac.edu).

The Glassy Winged Sharp Shooter (GWSS) problem has not gone away, but

the Ag Commissioner's office has been effectively monitoring and keeping it out of the county. Now in addition the Light Brown Apple Moth (LBAM) has been found in nearby Contra Costa County. Check out the information available online. One source is [cdfa.ca.gov/phpps/pdep/LBAM\\_brochure.pdf](http://cdfa.ca.gov/phpps/pdep/LBAM_brochure.pdf)

It's important to keep LBAM from establishing here any time soon. Although probably easy to control as is Omnivorous Leaf Roller (OLR), the political implications of quarantines will pop up. So be aware and prepared. To finish off the season it's good to think of few things before the end of the year.

## FALL CHECKLIST:

- ✓ If the weather stays dry, a light irrigation to help maintain soil moisture is okay until it rains steady.
- ✓ Little to no nitrogen should be applied now, but potassium now (or early next year) is okay. It won't "move" like nitrogen. To get full benefit of compost, it needs to be disked in.
- ✓ Make a note of any problem weed species that may be increasing.
- ✓ Mark any vines with excessive red leaves and/or leaf roll for monitoring of fruit quality next year for possible removal before then.
- ✓ Renew your Ag Waiver Discharge membership.
- ✓ Update your air pollution mitigation plan if you have 100 acres or more in a single vineyard.
- ✓ Also, review your pesticide use reports and get everything up to date as there is continued interest to keep agriculture "accountable" for problems real and perceived.
- ✓ For VMB, Lorsban (chlorpyrifos) post harvest can help keep it checked until the summer control program. Be careful to not apply before a storm, especially near natural drains and waterways.
- ✓ Gophers, voles and squirrel activity are still common and may deserve attention with baits, gas cartridges, fumigant pellets (usually better in spring), trapping, shooting, or a combination of several of the methods. Remember ground squirrels are fair game, tree squirrels require a depredation permit. Owl boxes help, but usually stabilize rodent populations, but do not control them.

## ATTENTION LANDOWNERS ALONG THE MOKELUMNE RIVER!

Mokelumne River Watershed landowners interested in receiving funding for habitat restoration/enhancement on private property should begin registering with the San Joaquin County Resource Conservation District. Through a grant funded process, SJCRCD recently finished development of a ranking criteria for restoration and enhancement projects.

Similar to the EQIP program, landowners must apply for the funds, and individual projects will be ranked. The application will include site visits from the watershed coordinator and/or other resource professionals to discuss the landowner's conservation goals and objectives. In addition to eligibility for receipt of possibly hundreds of thousands of grant dollars for projects, landowners will also receive a completed farm conservation plan.

There is a one time \$250 application fee per farm/property.

For more information, contact: John Brodie, Mokelumne River Watershed Coordinator;

Email: [rvranglr@yahoo.com](mailto:rvranglr@yahoo.com); Ph: (o) 209-472-7127 ext. 125

# Notes from Down Under

BY CLIFF OHMART Research/IPM Director Lodi-Woodbridge Winegrape Commission

During the month of August I had the great fortune to travel to Australia, courtesy of funding from the Australian Grape and Wine Research and Development Corporation (GWRDC) as well as from local winegrape grower groups in New South Wales, South Australia, and Victoria, for which I am very grateful. The purpose of the trip was for several speakers to present a series of workshops for winegrape growers focusing on vineyard IPM and sustainable winegrowing. My role was to present two lectures, one on the importance of pest monitoring and use of computer databases in vineyard IPM, and the other was to describe the evolution of The Lodi Rules for Sustainable Winegrowing program. The other speakers were from Australia and New Zealand speaking about the use of cover crops to enhance the populations of the natural enemies of Light Brown Apple Moth. The workshops were done in 9 different locations. One was at the Australian Wine Industry Technical Conference in Adelaide on July 31 and eight were in wine regions in the three states mentioned above. It provided me a wonderful opportunity to meet with a lot of Australian winegrape growers and find out about issues that are important to them, some of which we can learn from. I

therefore thought it worthwhile to share some of my observations.

Without a doubt, the most immediate and serious problem facing most Australian wine regions is the continuance of the worst drought on record. The time for the most effective rainfall to occur was just about past when I was there and while some rain had fallen in the major cities like Sydney and Melbourne, no where near enough rainfall has occurred in the water catchments which supply most of the water for people and crops. For example, growers in the warm winegrape growing regions of Sunraysia, the Riverina, and Riverland in the states of New South Wales, Victoria, and South Australia, where about 60% of the national winegrape production occurs, have already been told they will receive zero water allocation for irrigation this coming growing season. To make matters worse well water in most regions is too saline to be used for irrigation.

While there is no direct lesson for us from this unfortunate situation it is very likely the amount and quality of our irrigation water will become a critical issue over time, particularly in the western US, as climate change takes hold. We therefore can probably learn a lot from how the Australians handle their current water crisis.

I am sure all of you are well aware of the impact imported Australian wine has had on the American market. In fact, my guess is that many of you have an ambivalent feeling about Australian winegrape growers. They are great people but they are eating our lunch at certain wine price points, so to speak. You may be

interested to hear that they are also being significantly impacted by the global wine market. The eight wine regions I visited are primarily concerned with producing wines in the premium category and higher. Guess what the most commonly expressed concern was in these regions? How can I differentiate my wines from those from other Australian regions! Sound familiar? There was a general feeling among many of the growers with whom I spoke that only one region, the Barossa Valley, was well known outside of Australia and that the other regions need to begin to differentiate themselves, too. It is clear to me that in the presence of global competition differentiation from other regions, whether domestic or foreign is one of the major keys to the success of any wine region. Lodi growers have recognized this a long time ago.

One program that I was particularly interested in finding out more about was the Australian Grape and Wine Research and Development Corporation (GWRDC). This is the organization that manages the funds created from a national levy on winegrapes and wine as well as from Australian Federal matching dollars. The combined funds amount to over \$A20 million dollars annually for research and development in viticulture and enology. This dwarfs the amount of money available annually in the US for wine and grape research and has to be given major credit for the Australian wine industry being so successful in the global market.

The advantages of the GWRDC are obvious. It generates a large research fund each year which supports some of the best viticulture and enology research in the world. It also provided funds for market development and strategic planning. As I mentioned above, one cannot deny the success the Australian wine industry has had in the export market.

However, no program is perfect and I feel compelled to point out some of the

*continued on back*



100 PLUS YEAR-OLD SHIRAZ (SYRAH) VINES  
IN THE FAMOUS PENFOLD'S  
GRANGE VINEYARD IN ADELAIDE

problems with the GWRDC as related to me by some of the Australian growers and members of the research community.

The biggest issue for the people with whom I spoke was a lack of transparency in terms of how the GWRDC Board operates and they felt that this situation has gotten worse over time. For example, it was unclear how Board members are chosen. Another issue is that the levy program is indefinite, meaning there is no point in time the grower and winery community can vote whether to continue it or not.

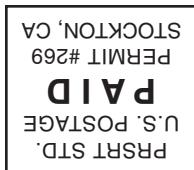
One of my biggest surprises was to find out that the grant proposals going to GWRDC are not peer reviewed as a part of the grant approval process. Apparently a committee, overseen by a Director of Research, determines who gets funded. I know of other organizations that determine research funding in this way, some of which are in the US. However, I personally think peer review is an absolutely critical part of any grant funding process to maintain third-party independence and ensure research quality.

I think there is a lot to be said for the success of the GWRDC model. However, as with all successful programs, there is always room for improvement.

I will end with observations on the outreach and extension of information and research results to Australian winegrape growers. It is not as good as one might expect. The irony of the situation is

that they have wonderful research being funded by the GWRDC but very little funding is devoted to extending it to the growers in a coordinated way. Since I did not talk to any winemakers I cannot comment on the level and quality of outreach to them. Many years ago outreach and extension in Australia were done by Federal and State Agencies and also Universities. Funding cutbacks dating back to the 1980's decimated these programs and what is left are a few agents in each state with virtually no national coordination. Growers are left to getting extension information from wherever they can such as winery reps, product sales people (affectionately called chemical resellers in Australia), state agents if available, or paid private consultants.

I left Australia convinced more than ever that the US has the best agriculture outreach and extension system of any western country of which I am familiar. That said however, as many of you know, the effectiveness of this system has eroded due to budget cutbacks over the last decade or so, in some states more rapidly than others. Canada, New Zealand and Australia have basically eliminated extension programs like ours and history has shown that nothing equal to its value has replaced them despite the best of intentions. Extension is absolutely critical to the success of our grape and wine industry and we must do everything we can to reinvest in it to build its capacity.



RETURN SERVICE REQUESTED

