UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION SAN JOAQUIN COUNTY

Along The Grapevine

WINEGRAPE IRRIGATION UPDATE---JULY 2004

This season started out with warm temperatures and adequate stored moisture. Little rainfall occurred after bud break. The result was rapid shoot growth. Syrah on a moderately deep soil which had not been irrigated grew shoots 160mm long by June 14. That's about 60 percent longer than a "typical" year. This increase in canopy has led to increased water consumption since the amount of leaves receiving sunlight is higher on an acre basis. In a typical year this should have lead to the need to begin irrigation earlier than usual. However, the season progressed into June with very mild temperatures followed by the same so far in July. Irrigation start dates are about the same as usual; however physiologically, the vines are more advanced.

Many of our vineyards slowly decreased in leaf water potential (increased stress) as time progressed towards veraison. In fact, many vineyards remain at near -12 bars (measured with the pressure chamber) after veraison but are now showing visual symptoms such as drying and dead tendrils. This is primarily a response to the physiological changes in the vine at veraison. At veraison, the major carbohydrate sink (translocation) transfers from the shoots to the fruit. Syrah in the same vineyard mentioned above, which was irrigated beginning May 21 to meet full potential water use, now has shoots of 220 cm in length.

This year's conditions underline the usefulness and objectivity of irrigation scheduling using both plant based (pressure chamber) and real time (current season) ET scheduling.

Review on Irrigation Scheduling for Winegrapes

Scheduling can be accomplished by simply following 5 steps.

1) Summing the real time daily reference evapotranspiration (ETo) values from the local CIMIS weather station on a weekly basis or use the 20-year average for the Lodi station in the table below.

   Example: June 17 to June 23, 2004 = 1.63 inches

2) Measure the percent shaded area in your vineyard at mid-day. To calculate full potential water use simply:

   Example: Row spacing = 10 feet. Shade = 4 feet. Shaded area 4/10 = 0.40

3) Calculate Full Potential Water Use = ETo × Shaded Area ×1.7

   Example: 1.63 × 0.4 × 1.7 = 1.1 inches in that week

4) Determine the level of water deficit you desire. 60 percent is considered conservative while 35% is considered risky (see web site below for details)

Example: 1.1 inches × 0.60 = 0.67 inches for deficit of 60%

5) Convert inches to gallons per vine. Inches of water to apply × vine spacing × 0.623 = gallons per vine

Example: 0.67 inches to apply × (7' × 10') × 0.623 = 29 gallons per vine

Further detailed information on this topic is available at: http://lawr.ucdavis.edu/faculty/prichard/

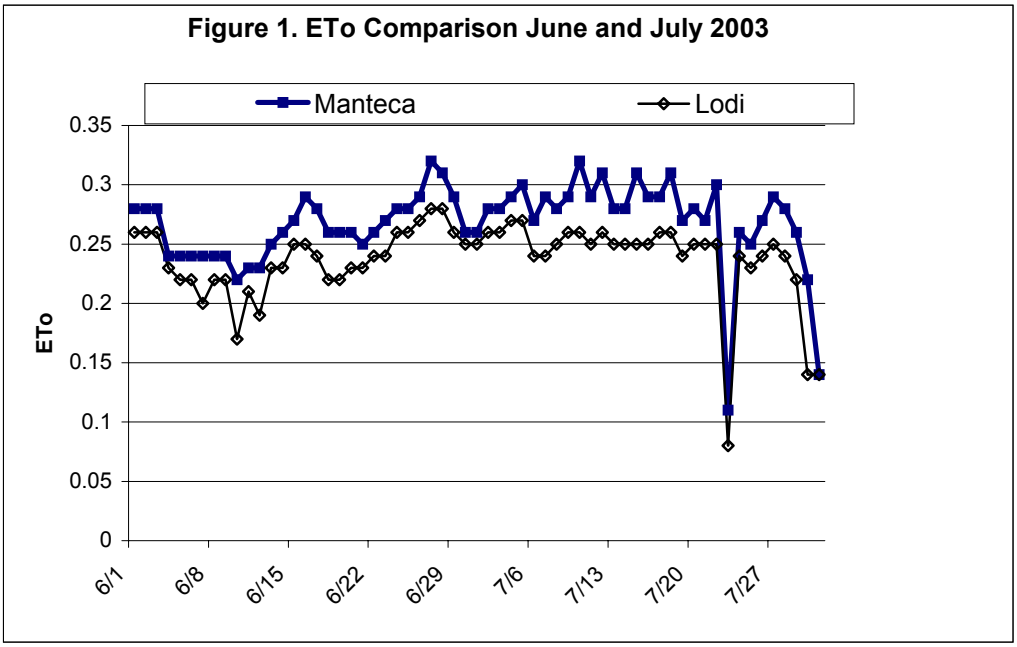
	Historical Average Weekly Non-Rain ETo Lodi CIMIS Stations # 42 & #166 Historical 1983-2003 (inches)	Manteca Adj. to Lodi ETo 2004 (inches)
April 1 - 7	1.14	
April 8-14	1.28	
April 15-21	1.24	
April 22-28	1.43	
April 29-May 5	1.57	
May 6-12	1.58	
May 13-19	1.59	
May 20-26	1.67	
May 21-June 2	1.67	1.584
June 3-9	1.74	1.701
June 10-16	1.82	1.701
June 17-23	1.85	1.629
June 24-30	1.80	1.701
July 1-7	1.86	1.665
July 8-14	1.82	
July 15-21	1.72	
July 22-28	1.69	
July 29 to August 4	1.68	
August 5-11	1.63	
August 12-18	1.56	
August 19-25	1.49	
August 26 to September 1	1.45	
September 2-8	1.37	
September 9-15	1.23	
September 16-22	1.17	
September 23-29	1.05	
September 30 to October 6	0.97	
October 7-13	0.88	
October 14-20	0.78	
October 21-27	0.66	
October 28 to November 3	0.54	
November 4 to 10	0.50	
November 11 to 17	0.40	

Note: Reference ETo = full cover grass not vine ET

The weather stations system which collect the climate data to calculate ETo is maintained by the California Department of Water Resources. They offer a web site with all the data collected over the past 20 years at over 100 sites in California. The URL to access this information is http://www.cimis.water.ca.gov/cimis.

Figure 1 below shows the difference between the Lodi and Manteca stations during June and July 2003. Notice the Lodi station reports ETo values about 10% on average below the Manteca station. It is very consistent in that over the 2-month period using 90% of the Manteca station values to predict the ETo at the Lodi station results in an error of only ½ of a percent. This is a valuable relationship in the event that the Lodi station fails at a critical time.

Figure 1. ETo Comparison June and July 2003



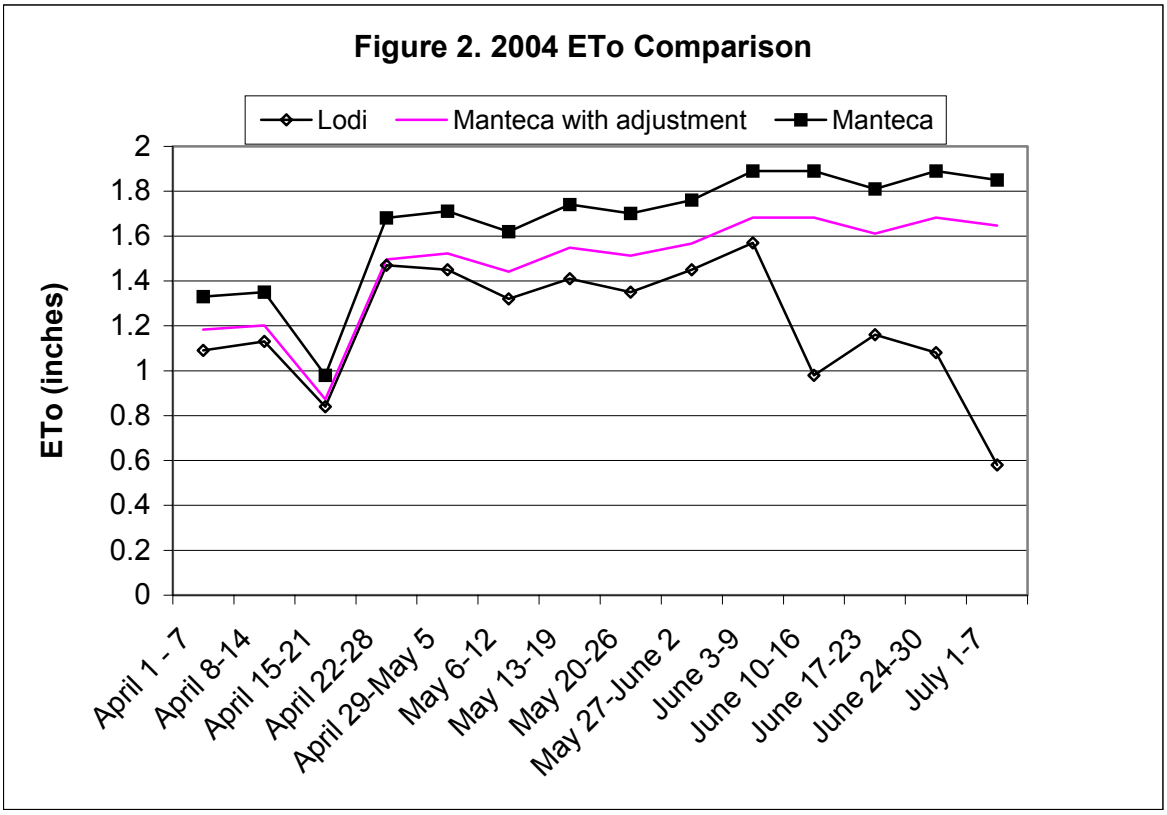
Problems with the Lodi CIMIS Station

In fact this year, we have noticed a significant variance from the historical ETo values at the Lodi station and in its relationship to the Manteca station. The following figure shows that after May 1, the difference between the Lodi and the Manteca station was greater than in previous years. By June 12, radical differences began to show. In the month of June, the Lodi station ETo were only about 50% of the correct ETo. DWR has been notified and is now attempting repair the Lodi station.

In an attempt to come up with a substitute for the Lodi station, a relationship was developed for the summer months between the Manteca and Lodi stations. The solid line in Figure 2 below represents 90% of the Manteca ETo values.

We recommend you use this method to estimate vine water use rather than the Lodi station until it is repaired. The weekly Manteca ETo × 0.9 values to date are listed in the table as the "Manteca adjusted to Lodi" ETo 2004 values. **To get future values, use the Manteca station #70 × 0.9.**

For those who began irrigating a few weeks ago using the Lodi ETo to base their irrigation volume, it will be necessary to recalculate from the day of irrigation using the Manteca adjusted ETo values. In any case there is time to catch up before any heat wave which could damage fruit quality and reduce yields. If recalculation indicates substantial irrigation water be added, the additional "catch-up" water should be added to the current calculation over a week or two time period. This is to prevent the reinitiating vegetative growth which can occur when too much water is applied over a short period of time.



On the Lookout

The topics of fruit quality, distinctive wines and irrigation will continue to be a topic of discussion as the market turns around. But in the meantime, the appearance of Glassy Winged Sharp Shooter (GWSS) in the Vacaville area has caused some concern. Locally, the Ag Commissioner staff has kept the GWSS a distant threat. Their success reinforces the need to be vigilant of any nursery material, both of vines and of landscape (maybe even more so) coming into the area. Free brochures and ID posters are available for placement in shops, barns and lunch areas.

Another unified vector is the Vine Mealybug (VMB). This pest has popped up in several locations in new vineyards planted during the period between 1998 and 2002 all across the state as well as locally. If you haven't attended a meeting or seen photos of this pest, pick up some information at the Lodi Woodbridge Winegrape Commission office, the Ag Commissioner's office, or the University of California Cooperative Extension office in Stockton. Currently the Ag Commissioner

is conducting a monitoring survey for countywide infestations of VMB. If you specifically have a concern or think some traps should be located in your vineyard check with any one of our offices. Be on the lookout for both pests as harvest approaches and field crews or equipment move about.

Additional information can be found at the UC IPM web site: http://www.ipm.ucdavis.edu/PMG or at our office in publication format:

Mealybugs in California Vineyards, ANR Publication 21612, 16 pages, 2002, $7.00

Pierce's Disease, ANR Publication 21600, 20 pages, 2001, $6.00

Paul S. Verdegaal
Viticulture Farm Advisor
San Joaquin County

Terry L. Prichard
Water Management Specialist
University of California, Davis