

Memorandum

DATE: July 17, 2016

TO: Holly Grover, CVRWQCB

Lake County Farm Bureau Education
Corporation
65 Soda Bay Rd.
Lakeport, CA
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SUBJECT: **Clear Lake Nutrient TMDL Progress Information Update Request:
Winegrape BMPS.**

Background:

Lake County Farm Bureau Education Corporation was contacted by the Regional Board in May with a request to supply information regarding best management practices implemented by growers in Lake County. Since Farm Evaluation information captures much of the efforts irrigated agriculture is making, LCFBEC chose to focus on the special efforts of the Lake County Winegrape Commission and winegrape growers in the area.

Cultural Practices of Winegrape Growers

The Lake County Winegrape Commission (LCWC) is a marketing order established in 1991 to assist winegrape growers through marketing, research, and educational programs. Since 1991, the LCWC has provided education and outreach to growers regarding best management practices that are protective of water quality and that promote erosion control. These best management practices used by winegrape growers capture a majority of Lake County irrigated agriculture. Through the LCWC, growers have access to the latest research in viticulture, real-time weather data and grower education. The Lake County Winegrape Commission is committed to ensuring Lake County vineyard operations continue to work toward the goal of certified sustainability, which they define as “being environmentally sound, socially equitable, and economically viable.” (LCWC 2014).

As part of this sustainability goal, the LCWC has a variety of programs. The Sustainable Winegrowing Program (SWP) produces education material and newsletters for growers. In 2012, the LCWC implemented two new programs: Certified California Sustainable Winegrowing (CCSW-Certified) and the Master Vigneron Academy (MVA). The CCSW-Certified program assists owners of small vineyards to become certified sustainable. Management practices promoted by the CSWA include: soil management, cover cropping for erosion control and irrigation and nutrient management practices (Larry Walker Associates, 2011). The Master Vigneron Academy works to maintain a consistency in cultural practices in winegrape growing throughout the county

and focuses on educating a professional vineyard workforce on the latest research and standards. The LCWC reports that more than 70 percent of Lake County growers have participated in their Code of Sustainable Winegrape Practices Self-Assessment Workbook and expect to increase that number every year (LCWC 2014). Through all these programs, the Lake County Winegrape Commission has maintained qualities of consistency and good stewardship throughout the county's vineyards.

Cultural practices in Lake County vineyards focus around water conservation, deficit irrigation, stout erosion control and sound site selection. The larger vineyards encompassing the most acreage in Lake County are the most likely to prescribe to the most sustainable management practices. According to Glenn McGourty of the UC Research and Extension Center, Lake County winegrape growers use a fraction of the water used by other commodities; 8 acre inches/year in the Red Hills compared to 18 acre inches/year used by San Joaquin Valley winegrapes or 38 acre inches/year used by Sacramento Valley almonds (McGourty et. al 2014). A combination of efficient irrigation systems and water management technology have been attributed to a 70% reduction in vineyard water use since 1984 (LCWC 2014).

Lake County wine grape growers use the latest water management technology to maximize grape quality, refine and limit water use and to keep their operations sustainable. Growers use a combination of monitors, models and field data combined with sophisticated drip irrigation systems to determine precise levels of watering needed by the vine to produce quality fruit. Traditional cultural practices involved watering up until the berries had color, and then reducing irrigation until harvest. However, research has changed practices, and growers now practice deficit irrigation before berries show color, which reduces berry size and increases quality. According to the LCWC, the goal is to get the berries to 20% water deprivation stress before June 24th, 30% water stress by July 8th and then to hold this moderate water stress until harvest.

Lake County winegrape growers use a variety of instruments and monitoring methods to achieve deficit irrigation as accurately as possible. The Lake County Department of Agriculture and the LCWC maintain some of Northern California's most sophisticated weather stations which produce data that can be analyzed in real time. But to refine the process even further, additional checks are made with a variety of probes interspersed throughout the individual vineyard. Soil moisture data, shoot length and stress index evaluations are inputted into a computer that generates up to 500-600 reports per week. These reports inform growers whether or not they need to irrigate and how much water to apply.

Lake County wine grape growers prescribe to the philosophy that water management is the key to the quality of the wine grape. Local growers have used sophisticated water management practices for more than 30 years and demonstrate a long-term commitment to sustainability. Coastal Viticultural Consultants have estimated that Lake County vineyard water use has dropped by more than 70% since 1984 (LCWC 2014) which has correlated with an increase in the quality of Lake County wine. Water management practices as described above have become common cultural practices in Lake County vineyards and wine grape growers continue to refine their growing practices and levels of sustainability each year.

Irrigation Practices in Lake County Vineyards

Drip irrigation systems are the standard for Lake County vineyards as they provide a precise and uniform amount of water that can be managed in real time. These sophisticated systems allow growers to use only enough water that the vine needs. They also conserve water by watering in small, consistent quantities, which greatly reduces losses from evaporation and produces no effective water run-off (LCWC 2014). Drip irrigation is essential for deficit irrigation, where growers intend to moderately stress the vine and not provide as much water as it would use. Glenn McGourty of the University of California Research Extension Center in Hopland has worked closely with Lake County vineyard managers to develop irrigation practices that both maximize fruit quality and conserve water. Growers have relied on his research and outreach in their drought management practices, as well his soil moisture research. In site selection, Lake County growers often choose for areas with high soil porosity, as is typical in the hills and bench areas characterized by the Red Hills, Kelsey Bench and High Valley American Viticultural Areas (AVAs). In these volcanic soil types, water is absorbed quickly and efficiently. These soils limit water run-off in rain-fall, and increase the efficiency of drip irrigation.

Sprinkler systems are rarely used in the growing season, but are sometimes used for frost protection during the early spring in Lake County vineyards.

Erosion Control in Lake County Vineyards

Winegrape growers take great steps to reduce erosion in the vineyards, as soil depth can be shallow in the Red Hills and Kelsey Bench AVAs. Waddles are used both in vineyards and along avenues to keep sediment in place, especially during new vineyard development. It is standard practice to grow cover crops between rows and to either seed with a grass mix or native cover crop. On the valley floors, such as in Big Valley, Scotts Valley and High Valley, cover crops grow readily. In the Red Hills, straw is used as a standard practice to protect the soil until grass can seed.

Growers must undergo strict erosion control standards when developing new vineyards. The County of Lake developed an Agricultural Grading Ordinance and requires a grading permit for any grading or clearing of non-current agricultural land or for ponds and reservoirs over 1 acre foot in capacity. Under the current Grading Ordinance implementation of BMP's is required for new agricultural properties (native vegetation to agriculture) and conversions of deep rooted crops (orchard to vineyard) on soils with a moderate to severe hazard rating. Detailed in this ordinance are restrictions to grading on certain soil types, proximities to waterways or riparian habitats and required mitigation practices for revegetation and dust control.

Some orchard to vineyard conversions that occur in Big Valley fall under the ordinance exemption for crop conversions as long as they do not expand the footprint of the existing farming activity or operation, do not occur within thirty feet of the top of bank of a water body, do not remove other plants having stable woody root systems extending at least twelve inches below the soil surface and occur on soils with a moderate or severe erosion hazard rating, do not occur during winter period and do not cut or fill slope with a 2:1 or greater ratio. This is because the Big Valley is flat farmland with lakebed and alluvial soils.

Vineyards that get developed or converted in the Red Hills area usually fall under the ordinance and must adhere to strict standards of grading and mitigation. Vineyard managers take great care in preserving the shallow volcanic top soil in these areas with wattles and straw during development and cover crop in the mature vineyards. The grading ordinance also outlines restrictions and

mitigations on roadways and infrastructure in the vineyards to reduce erosion hazard on access roads. These provisions outlined in the ordinance serve to protect water quality from sediment run-off and protect the vineyards from loss of top-soil.

In the large Red Hills vineyards such as Amber Knolls, any potential water run-off from winter storms is diverted into a water catchment system producing effectively zero off-site runoff from the vineyards and avenues. While smaller vineyards may not have these sophisticated catchment systems, the majority of irrigated vineyard acreage in the Red Hills AVA falls under these management systems.

Erosion control management practices are implemented to limit the amount of sediment runoff and fertilizer runoff. A 2007 survey conducted by the Lake County Farm Bureau Education Corporation indicated that 90% of vineyard acreage is maintaining a permanent or winter annual cover crop.

References:

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- Lake County Winegrape Commission (2014) Sustainably Managing Water Use, Lake County Winegrape Commission Video Series. November 30, 2014. <http://www.lakecountywinegrape.org/sustainably-managing-water-use/>
- Larry Walker Associates, 2011. "Clear Lake Nutrient TMDL Progress Information Request", Memorandum to Bruce Houdesheldt, NCWA. November 23, 2011
- McGourty et al. (2014) "Vineyard Water Use in Lake County, California" Glenn McGourty, Ryan Keiffer, Dr. Broc Zoller, UCCE Mendocino and Lake Counties, December 1, 2014. <http://www.lakecountywinegrape.org/wp-content/uploads/2014/08/Lake-County-Vineyard-Water-Use-UC-Cooperative-Extension-December-1-2014.pdf>
- McGourty, Glenn "Vineyard Irrigation with a Limited Supply of Water", University of California Research and Extension Center, Hopland. 2014.