

Frost Protection and Water Conservation

The State Water Resources Control Board passed (SWRCB) a Frost Regulation that will impact all grape growers in the Russian River Watershed beginning in 2012. This regulation has two components, registration of frost water systems with the Sonoma County Agricultural Commissioner and participation in a Water Demand Management Program (WDMP) that has been approved by the SWRCB. Growers will be required to record days when water is used for frost protection, acres protected and hours of use. Those records must then be provided to the WDMP and ultimately to the SWRCB.

It will be important for growers who use water for frost protection to utilize best management practices in order to conserve water and decrease impacts on stream flow. This is critical if growers are to avoid fish strandings during frost events and regulatory penalties under the Endangered Species Act.

Best management practices for frost control:

- Keep cover crops and other vegetation closely mowed to the ground. Moderate or tall vegetation lowers vineyard temperatures at night and increases frost risk.
- Double-pruning or late pruning will retard budbreak. Conduct the final pruning after the more apical buds have pushed.
- Use your own thermometer. Frost is very site-specific, so don't rely on a remote weather station or your neighbor's thermometer. Measure well away from your neighbor's vineyard if it has sprinklers in operation.
- Better yet, use a bulb-type, aspirated psychrometer (wet and dry bulbs), like a Psycho-Dyne, available online (\$165) at www.forestry-suppliers.com. The wet bulb is very useful. Portable electronic types are available, but are less accurate at low dew points than are bulb-types. Sling psychrometers may also be used.
- Use dew point values to determine your threshold for sprinkler start-up. Use a psychrometer and associated look-up tables, if possible. If not, using publicly-available dew point information within your region is better than using nothing.
 - Guidelines¹:
 - Dew point greater than 35°F: - Little chance of frost damage²
 - Dew point of 24°F or higher: - Turn on sprinklers at 34°F air temp.
 - Dew point between 20 and 23°F: - Turn on sprinklers at 35°F air temp.
 - Dew point of 19°F or lower: - Turn on sprinklers at 36°F air temp.
 - These apply only when frost is predicted. Turn off sprinklers when air temperatures rise back to 34°F, ice is melted, or wet bulb temperature exceeds 32°F.
 - If using a wet-bulb device, frost control must be active for wet bulb temperatures of 32°F or lower.
- Wet soil surfaces conduct and store heat better than dry ones. If soil dries out by late spring and frost is forecast, brief irrigations (1-2 gallons per vine) periodically may help.
- Use wind machines to assist in frost control, where available and applicable.

Prepared by Mark Greenspan, Advanced Viticulture, with input from Sonoma County winegrape growers.

¹Snyder, R. (2000) Principles of Frost Protection. University of California Regents.

²Glen McGourty, Oral presentation. UC Cooperative Extension.