



EM4831E

GRAPES

The severity of drought conditions in a short water year will depend on numerous factors that are specific to individual vineyards. Timing of water delivery; amount of water available; timing, intensity, and duration of hot spells during the summer; soil depth and method of irrigation will determine a grower's ability to reduce severe water stress in vineyards. This information, along with other advisories on irrigation management and efficiency, outline critical management concerns and possible solutions for growers during periods of inadequate availability of water.

Grapevine Water Use

Given a deep soil profile, grapevines will produce an extensive root system; vines are excellent foragers for water. Concord or *Vitis labruscana* type vines have somewhat smaller root systems than wine grape varieties. Under all but the most extreme drought situations, vine survival is probable, although crop quality and yield may be low. In newly planted vineyards, water management is critical to provide sufficient irrigation for proper establishment. Growers may want to consider delaying the establishment of new vineyards until irrigation forecasts have improved.

Extreme water stress in vines can be most damaging during late spring and early summer, when shoots grow rapidly and cell division occurs in the berries. Poor berry set and smaller berries result from severe stress in late spring and early summer. A second critical period is during the summer, when cell expansion takes place in the berry. Severe water stress during this late summer ripening stage can reduce berry size

and may delay, or under very severe conditions, prevent fruit maturation.

Culture Practices under Water Deficit

Until grape growers know the extent and nature of water rationing, consider the following cultural practices to provide the most efficient use of water.

- Fertilize and prune vines to produce moderate growth and yields.
- Reduce weed growth in the vineyard to avoid competition with vines for limited water supplies.
- Keep cover crops mown; plan to spray them out if drought conditions become severe.
- Thin heavy crops to more moderate levels.

Irrigation Practices

Drought conditions may require using water with utmost efficiency. Growers should constantly monitor soil moisture and apply water only when needed or at strategic times during the delivery period.

Improve irrigation systems so water is applied as efficiently as possible. Be sure to inspect the irrigation system to ensure the functionality of all components. Scientific irrigation scheduling will increase water savings and avoid overwatering. Other supplemental drought advisories are available at Extension offices to help growers with soil moisture monitoring, improving irrigation efficiency, and irrigation scheduling.

The timing of water delivery will determine how growers should use available water. Drip irrigation would be the best system to use if low levels of water are available for an extensive part of the growing season. If 100% of normal supply is available for short periods, rill or sprinkler irrigation systems would allow application of large quantities of water over a short period of time.

Use early irrigation, as soon as water is available, to fill the soil profile if winter precipitation has not been adequate. Avoid overirrigation, which can result in inadequate iron and zinc uptake and leaf chlorosis. Be sure the soil moisture level is high at the irrigation cutoff date in preparation for the next growing season.

Other Considerations

Consider alternate sources of water. These would include wells, tailwater, and stream or storage water. Contact your local irrigation district or Department of Ecology office for more information on regulations and permits. The large investment needed to obtain alternate sources of

water may be justified, as water reservoirs may be depleted again in future irrigation seasons.

Crop insurance is available for grape growers and will cover drought. Owners of grape blocks on drought susceptible land might consider this option.

Information on soil moisture monitoring and crop evapotranspiration from Washington's Public Agricultural Weather Stations (PAWS) and Washington Irrigation Scheduling Expert (WISE) are available on the Scientific Irrigation Scheduling (SIS): web page
<http://sis.prosser.wsu.edu>

Drought advisories and other Washington State University Extension Bulletins are available online at
<http://pubs.wsu.edu>
Type "drought" in the search box for downloadable files.

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