

Water in the Vineyard—Friend or Enemy?

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(Eleventh in a series of highly opinionated articles about grapes and wine in El Dorado County)

In many parts of the world, grapes are grown with no artificial irrigation, because, believe it or not, it rains in the summertime. In European or Eastern U.S. grapegrowing areas, bringing up the subject of irrigation produces a blank stare and the question “Why would you need to do that?” Here in glorious sunny California, we need to supplement the natural supply of groundwater, at least in most years (please don’t say El Niño again, ever).

Irrigation-When and How

Grapevines are thirsty creatures—they have a lot of leaves because they need to make a lot of sugar, and that means they lose a lot of water through those leaves. Depending on the variety, the age of the vine, and the trellising system, they may require no water all summer long or they may need regular long drinks to get through the dry months.

For the first few years after vines are planted, they all need irrigation because the root system has not developed enough to allow them to find water underground. As a general rule, you need about two gallons per minute of well water per acre of vines (all right, one and a half minimum, but don’t try it with one gallon per minute per acre), and even if you plan to have a field that is dry-farmed (non-irrigated) at maturity, you will need this much water to get the vines through their formative years.

Grapes are amazingly adaptable plants, and they will take the path of least resistance—if there is water at the surface, they will develop only surface roots; if the only water available is deep in the ground, they will sink roots up to fifty feet deep in order to find it. If you provide an unlimited supply of water, the vine expects good times forever, but if you allow it to live with a little stress, it will react by developing roots that reach down far enough to supplement the scarce surface water (yet another grapevine metaphor about life).

Infant Care

Almost all irrigation today is done with half-inch diameter black plastic tubing with emitters (drippers) near the trunk of each vine that allow a flow of one gallon per hour. The first year vines are in the ground, a good rule is to water each vine for 24 hours, once a week. In the second year, you can start to encourage deeper root growth by increasing the time between waterings. If the vineyard is right outside your door, you can watch the plants to see when they start to look dry, then water accordingly. If you can’t watch them every day, it would be better to stick to a regular schedule, stretching the watering interval to ten days or two weeks (but watch out for heat waves—a few days over 100 degrees can quickly deplete the surface water and fry the young vines).

The 24-hour irrigation cycle is important at any stage of the vine's life, because this allow the ground to be saturated to a depth that encourages deeper root growth. Shorter cycles (or more frequent intervals) will wet a shallower depth of soil and stunt the root growth.

By the third or fourth year, you will start to make a distinction between vines that will need water forever, such as cordon-trained vines with thick branches stretched on a support wire, and head-trained vines that will be dry-farmed, such as zinfandel or petite sirah. The dry-farmed vines should be watered in these years only during extreme heat or following a dry spring, but the others should be kept on a once-a-week schedule to support the increased leaf and fruit growth.

It is important to pay attention to the water requirements of young vines—growth lost in the early years due to water deficiency can haunt the vines for years or even decades to come. Later in life, a mistake in irrigation can affect a single year's crop, but the mature vines will bounce back from a year of error or abuse.

Annual Patterns

In normal years (please pay no attention to 1998), vines will start to need irrigation in early July, continuing until late August or perhaps even September. It's usually a good idea to stop irrigating several weeks before harvest, to provide some water stress and hasten ripening of the grapes. But you don't want to stop too early, since hot windy weather can cause excessive stress and make the berries shrivel. In the dry years during a drought, you may need water as early as June and all through September, but this year many vineyards required no irrigation at all after the rains that continued into June. Like most other farming decisions, it requires experience, judgement and long talks with your fellow growers down at the hardware store.

The infrequent summer rains we get usually don't affect the amount of irrigation required, since they rarely penetrate more than an inch or two into the soil. They will, however, dramatically increase problems from powdery mildew, both by washing protective sulfur off the leaves and increasing the humidity inside the "canopy" of shoots and leaves (see nasty comments above about 1998), but that's a subject for another column.