

Ten Keys to Successful Irrigation Management

In order to make wine of the highest quality possible, it is important to start with grapes that are uniform in maturity. One of the major goals of any winegrape vineyard management team is to produce the highest quality fruit possible. Grapes of uniform maturity come from vines with uniform vigor. Vineyard management, therefore, becomes a matter of *vineyard vigor* management. One of the most effective tools in vigor management in arid viticultural regions is *Irrigation Management*.

Irrigation Management deals with the manner in which water is applied to the vineyard. It encompasses everything from the decision of how much water to apply and when to apply it to irrigation system maintenance. The vineyard management team must also deal with the issues of the chemistry of the source water and its effect on fertilizer selection and emitter plugging, along with servicing the system filters and flushing the mainlines and hoses regularly. The challenge of successful irrigation management is performing these various tasks well, while at the same time performing the more immediate viticultural tasks such as vineyard cultivation, vine training, disease prevention and pest monitoring. It is all too common to find that irrigation scheduling or system maintenance becomes overlooked during the hectic growing season. This oversight leads to a lack of irrigation uniformity, the results of which are variations in vine vigor with grape bunches of varying maturity at harvest and the corresponding drop in wine quality.

What then, are some of the keys that allow the vineyard management team to maximize their system's potential in delivering water and nutrients to the vines in a uniform manner?

1. **Have a clear vision of what you expect from your vineyard.** This not only includes the tonnage at harvest, but also the size of the canopy, number and length of canes per vine, expected date of bloom, veraison and harvest, etc.
2. **Know the limitations and potential of the irrigation system.** In many cases the management focus is on an area outside the capability of the delivery system. Examples of this would include inappropriate fertilizer injections that cause excessive emitter plugging or walking the fine line of "deficit irrigation" with an irrigation system whose Distribution Uniformity is suspect.
3. **Know the vineyard soil and its inherent variability.** Keep in mind that the goal is to arrive at harvest with the maximum amount of fruit at a uniform maturity. Variability in soil texture and depth has a great effect on vine vigor.
4. **Know where the vine roots are located.** This varies with soils, variety, rootstock, emitter placement and irrigation practices. This is essential knowledge when placing soil-moisture monitoring devices or considering the injection of fertilizers.
5. **Know how much water the vines need to match your "vision" and develop a schedule to deliver that amount.** In most cases, controlling the vigor of the vineyard requires controlling the amount of water applied and when it is applied.

6. **Know the quality of your water source.** This includes the sand, silts, organic matter and dissolved salts as well as the quantity and availability of the water throughout the irrigation season.
7. **Develop a comprehensive fertigation plan.** The associated variables include water quality, soil chemistry, fertilizer selection and application alternatives, vine vigor and crop potential.
8. **Know how to operate and maintain the irrigation system.** Just like a spray rig or a mechanical harvester, the drip irrigation system can be driven over a cliff.
9. **Know how to effectively sanitize and flush the irrigation system.** Even the best agricultural filters will not prevent the gradual accumulation of inorganic and biological contaminants within the mainlines and hoses. This ecosystem requires monitoring and periodic control measures to maintain a high degree of Distribution Uniformity.
10. **Provide training to the irrigation team.** Most vineyard irrigation success stories are a team effort that includes the owner, wine maker, vineyard manager, agronomist and irrigator. Each player on the team deserves proper training to insure a smooth implementation of the irrigation management plan during the hectic growing season.

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