

MANAGING IRRIGATION AND WATER USE FOR FROST PROTECTION (OPTIONAL)

Background: Efficient irrigation management maximizes water use for crop production and minimizes water losses caused by runoff, evaporation, and deep percolation. Water applied during irrigation benefits crop growth by providing moisture for transpiration, preventing the build-up of salts in the root zone, and moderating the air temperature around the crop. Irrigation water that runs off or percolates beyond the root zone wastes water and energy and may contribute to surface water or groundwater pollution.

Purpose: Identify practices, currently in use or intended for implementation, to ensure that water is used efficiently.

Water Sources and Management

I1. Check all sources of water that are utilized.

- Surface Water
- Ground Water
- Municipal Water
- Reclaimed / Recycled Water (from off-site)
- Reclaimed / Recycled Water (from site)
- Harvested Rainwater
- Other (list)

Describe as needed:

I2. Check all systems that are utilized.

- Drip/micro irrigation system
- Sprinkler for irrigation (Implement practice # 2, listed in Table I1 below)
- Sprinkler for frost protection
- Other (list)

Describe as needed:

13. Irrigation and/or frost protection systems were designed by an agricultural engineer, irrigation consultant, or other professional.

- Yes
- No (Consider practice # 3 in Table I1 below)

Describe as needed:

14. Irrigation is scheduled and applied according to plant needs as determined by water monitoring and management tools (e.g., gypsum blocks, neutron probes, tensiometers, leaf pressure bombs, porometers CIMIS, weather stations, etc.) and visual observations.

- Yes
- No (Consider practices # 4 and 7, in Table I1 below)

Describe as needed:

15. Water management techniques such as delayed onset of irrigation, dry farming, deficit irrigation, and partial root-zone drying are considered and used to meet viticultural and conservation goals.

- Yes
- No (Consider practices # 4, 5, 21 and 22, listed in Table I1 below)

Describe as needed:

16. Irrigation and frost protection (if applicable) systems are monitored for leaks and performance, and maintained regularly.

- Yes
- No (Consider practices # 8 through 12, listed in Table I1 below)

Describe as needed:

17. Water use is monitored with a flow meter and documented.

- Yes
- No (Consider practices # 13 and 14, listed in Table I1 below)

Describe as needed:

18. Reclaimed, recycled and harvested water are utilized to the extent practicable.

- Yes
- No (Consider practice # 15 through 17, listed in Table I1 below)

Describe as needed:

19. If there are pond(s) on the property, are they maintained to reduce leaking and evaporation?

- Yes
- No (Consider practice # 18 and 19, listed in Table I1 below)
- N/A (no ponds on property)

Describe as needed:

Table I1: Conservation Practices for Managing Irrigation

The following table provides an assortment of management practices that are intended to improve water use efficiency. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis. An assortment of practices to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference and you may contact your local NRCS or RCD field office for technical and/or possible financial assistance.

<i>Conservation Practice</i>	<i>NRCS Practice Title</i>	<i>Current Practice</i>	<i>Planned Implementation Date</i>	<i>Location</i>
1. Consult a Professional		<input type="checkbox"/>		
2. Convert to a drip irrigation system	Irrigation System, Micro-irrigation (441)	<input type="checkbox"/>		
3. Conduct a distribution uniformity evaluation and implement system improvements accordingly (every 3 years recommended)		<input type="checkbox"/>		
4. Install and utilize soil moisture monitoring devices, remote sensing or telemetry devices	Irrigation Water Management (449)	<input type="checkbox"/>		
5. Install and utilize a weather monitoring system or utilize a nearby CIMIS weather station to inform irrigation and frost protection scheduling	Irrigation Water Management (449)	<input type="checkbox"/>		
6. Integrate timers and controllers into the irrigation system	Irrigation Water Management (449)	<input type="checkbox"/>		
7. Update controllers and timers throughout season to match actual water needs		<input type="checkbox"/>		
8. Conduct system test annually prior to frost and/or irrigation season.		<input type="checkbox"/>		
9. Conduct periodic monitoring (for leaks and other issues) during the season of use and repair as necessary.		<input type="checkbox"/>		
10. Flush hoses on a regular basis		<input type="checkbox"/>		
11. Conduct end of season system maintenance to clear lines		<input type="checkbox"/>		
12. Conduct pump efficiency tests and retrofit pumps as needed		<input type="checkbox"/>		

13. Install and utilize flow meters to monitor and record water use	Irrigation Water Management (449)	<input type="checkbox"/>		
14. Inspect and calibrate flow meters annually		<input type="checkbox"/>		
15. Consider options for reclaimed / recycled water, including possibility of recycled water from local treatment plants that may be available for trucking		<input type="checkbox"/>		
16. Install bioreactors to manage wastewater and create additional irrigation supplies		<input type="checkbox"/>		
17. Consider rainwater harvesting (i.e. tanks and ponds) and storage, particularly if there are large buildings on-site	Water Harvesting Catchment (636)	<input type="checkbox"/>		
18. Install pond liners and covers	Pond Sealing or Lining (521)	<input type="checkbox"/>		
19. Inspect ponds for leaks, clogging and other issues		<input type="checkbox"/>		
20. Upon replant, consider rootstocks that are more drought tolerant		<input type="checkbox"/>		
21. Build organic matter in soil with cover crops and/or compost applications	Cover Crop (340)	<input type="checkbox"/>		
22. Increase infiltration with swales and catchment basins	Grassed Waterway (412) Sediment Basin (350)	<input type="checkbox"/>		
Other:		<input type="checkbox"/>		

Water Management and Frost Protection

I10. Water is used for frost protection.

- Yes
- No (Consider practices # 2 through 7, 9, and 11 in table I2 below. Skip the remainder of section)

Describe as needed:

I11. Passive frost protection methods (e.g. wetting soil before frost, mowing cover crops, creating air barriers, planting varieties and rootstocks with later budbreak) are utilized.

- Yes
- No (Consider practices # 3 through 5, 9, and 11 in table I2 below. Skip the remainder of section)

Describe as needed:

I12. Water, as a frost management tool, is utilized only in areas where alternative practices are not feasible.

- Yes
- No (Consider practices # 6 through 9 and 11 in table I2 below).

Describe as needed:

I13. The frost protection system is turned on based upon the factors of temperature and humidity (wet-bulb temperature or forecast dew point) and turned off as soon as danger has passed.

Yes

No (Consider practice # 10 in table I2 below).

Describe as needed:

Table I2: Conservation Practices for Frost Protection

The following table provides an assortment of management practices that are intended to improve water use efficiency. Implementation of all practices is not necessary or required. Selection of practices must be done on a site-specific basis. An assortment of practices to suit your circumstance should be selected. NRCS Practice Titles are provided for your reference and you may contact your local NRCS or RCD field office for technical and/or possible financial assistance.

<i>Conservation Practice</i>	<i>NRCS Practice Title</i>	<i>Current Practice</i>	<i>Planned Implementation Date</i>	<i>Location</i>
1. Consult a Professional		<input type="checkbox"/>		
2. Identify potential frost hazard areas		<input type="checkbox"/>		
3. Wet the top foot of soil to field capacity 2 to 3 days before a frost event		<input type="checkbox"/>		
4. If feasible, mow cover crop and keep it short during the frost season		<input type="checkbox"/>		
5. Install or remove “air barriers” to optimize air drainage and prevent pooling of cold air in vineyard areas		<input type="checkbox"/>		
6. Install wind machines in areas where noise pollution is not a consideration		<input type="checkbox"/>		
7. Install towerless wind machines in low lying areas where cold air drains or pools		<input type="checkbox"/>		
8. Convert to a system of microsprayers		<input type="checkbox"/>		
9. Upon replant, consider alternative frost protection methods, including planting varieties and rootstocks with later bud-break, to shorten frost hazard period		<input type="checkbox"/>		
10. Use available weather, temperature, and humidity information to make informed decision about the timing of frost protection.	Irrigation Water Management (449)	<input type="checkbox"/>		
11. Delay pruning, and/or prune in two stages, to delay vine growth and shorten frost hazard period		<input type="checkbox"/>		
Other:		<input type="checkbox"/>		