

SIP Certified® Standards 2019

SIP Standards | All Required Questions | 2019

Sustainable agriculture is based on the three “E’s” of sustainability. In the vineyard and winery, managers must address these three “E’s” - economic viability, environmental stewardship, and social equity. An important theme of integrated wine production is the ability for winegrowers to evaluate their practices as a whole - from block to bottle. Sustainability in Practice (SIP) Certified is a measurable and recordable set of practices which encompass fourteen chapters comprised of Vineyard Conservation and Enhancement of Biological Diversity, Vineyard Establishment and Management, Winery Facility Establishment and Management, Vineyard Soil Conservation and Surface Water Quality, Water Conservation and Quality, Energy Conservation and Efficiency, Pollution and Waste, Social Equity, Pest Management, Grape Sourcing and Fruit Quality, Continuing Education, and Business Management.

The certification Standards include both Requirements and Management Enhancements. Requirements are practices which must be completed on a foundational level before acquiring Management Enhancement points. In the vineyard, Requirements include a Prohibited Materials List (listed by active ingredient) based on the Department of Pesticide Regulation’s following lists: Groundwater Protection, Cholinesterase Inhibiting, Toxic Air Contaminants, California Restricted Materials and Federally Restricted Materials. In order to achieve certification, a grower must not use any of the active ingredients on this list. Management Enhancements are scores assigned to practices which allow winegrowers to earn points based on additional, non-required, but suggested management strategies. Also included within the document is a farm/winery plan which is required for certification – the plan includes documentation, reporting, and written examples of practices throughout the certification standards.

Certification will be awarded based on the applicant complying with all Requirements as well as achieving a minimum of 75% of the total available points. A winegrowers practices and documentation are verified through an independent audit and reviewed by an advisory committee. The purpose of certification is for winegrowers to evaluate and substantiate their practices on a whole-operation level. This allows for marketplace authenticity and differentiation. SIP Certified also recognizes the need for continual improvement both in practices and certification standards. The SIP Certified Standards are considered to be part of a living document; they will improve over time with advances in science and research.

SIP Certified evolved from the innovative and award winning Positive Points System - the first self-assessment utilizing a whole farm, integrated approach to vineyard management. The shift from self-evaluation to third-party certification began in 2003 when a group of dedicated growers and advisers began developing a set of standards, with measurable and verifiable requirements and certification for vineyards piloted in 2008. Because sustainable winemaking does not stop in the vineyard, a program for wineries was piloted in 2016/17. The program is peer reviewed every five years by over 50 environmental, regulatory, and academic representatives.

Applicants can choose to certify their vineyard or winery or both by implementing the rules covered in the Standards. Wines can carry the SIP Certified seal on their packaging when they are made with at least 85% SIP Certified fruit as verified by an inspection.

SIP Certified applies to individual vineyards, wineries and year specific wines and does not certify organizations.

1 — Conservation and Enhancement of Biological Diversity

“To conserve biodiversity is to maintain and enhance the capacity of the land to sustain a variety of native species and functioning ecosystems that support farms and wild communities.” (www.wildfarmalliance.org)

Sustainable agriculture is founded on the principle that farming practices influence a much larger system than just the vineyard, more commonly referred to as the whole farm system. The whole farm system includes the vines, the rows between the vines, wildlife habitat, adjacent oak and riparian areas, surrounding wetlands, receiving waters, and other non-cropped areas.

The vineyard manager works within this whole farm system to promote and protect the balance of ecological resources in the vineyard. Conserving and enhancing biodiversity can support a pest management program by enhancing beneficial insect habitat or providing nest boxes for owls and raptors that prey on vertebrate pests. Planting filter strips and maintaining covered soil protects water quality by keeping sediment on site and out of surface water.

Sustainable agriculture is based on the stewardship of natural resources. Biological diversity is a valuable component and should be managed to benefit the natural ecosystems which support a wide variety of plant and animal species. Increased on-farm diversity is indicative of a healthy, balanced ecosystem where varied ecological processes thrive. The conservation and enhancement of biological diversity should be the goal of the vineyard manager with the objective of operating in an environmentally responsible manner.

1.1 Conservation and Enhancement of Biological Diversity

Requirements

1. You must have and update at least every five years a conservation plan based on the type(s) of habitat affected by new vineyard development and/or ongoing vineyard operations. A Natural Resource Conservation Service Conservation Plan **or equivalent** qualifies.

Attach conservation plan including identification of habitat areas on your ranch map and document below what sensitive species, if any, exist in your area.

When was the plan last completed?

Equivalent plans will address the following sections. Download template (http://www.vineyardteam.org/files/resources/2_1.1.1_Conservation%20Plan_Template_Written.pdf).

- Short and long term
- Natural resource objectives
- Production and economic objectives
- Resource inventory and resource concerns
- Soil
- Erosion potential and management plan
- Streams and/or waterbodies
- Air quality
- Cover crops, filter strips, and vegetated buffers
- Snag and cavity trees
- Noxious or invasive plants
- Hedgerows and windbreak shelter trees
- Forest/woodland areas
- Wetland areas
- Wildlife areas
- Animals, fish and wildlife
- Rare or endangered plant and animal species
- Prioritized resource concerns and projects



 Onsite Inspection Required

2 — Vineyard Acquisition, Establishment and Management

In order for growers to sustainably produce high quality fruit, they must understand that every aspect of viticultural management affects other components of the vineyard system. From identifying the optimal vineyard site to harvesting the fruit, there are many decisions that affect the vineyard's ability to sustainably produce high quality fruit with minimum inputs and manipulations. With an understanding of the farm's unique site characteristics, the viticulturist makes decisions about rootstock, clone, spacing, orientation, trellis system and irrigation, among other variables, that will support an environment which optimizes the production of quality fruit in a responsible manner. Each decision affects many aspects of the grapevine's unique environment, and the viticulturist must be vigilantly aware of those interactions. The interrelated nature of all vineyard management practices creates an interconnected relationship from viticultural management to water quality to air quality to social equity.

In operating a vineyard, the grower manages an ecosystem dominated by vines and cover crops – this system is supported by a complex soil ecosystem and populated by a diverse group of organisms that are natural members of the agricultural ecosystem and the ecosystems surrounding it. Most of these organisms are beneficial, in fact essential, to the functions of a healthy vineyard. Sustainable farming requires that the vineyard system be managed to produce an optimum crop of consistently high quality fruit while minimizing adverse impacts to the environment and human health associated with vineyard operations.

Maintaining and enhancing this dynamic ecosystem is at the heart of sustainable viticulture and should be the goal of the vineyard manager.

2.1 Pre-Plant/Purchase

Requirements

1. You must document the soil series, permeability (Ksat), drainage class, runoff, and T Erosion Factor of your soils by using the USDA Web Soil Survey (<https://casoilresource.lawr.ucdavis.edu/gmap/>) or contacting your local USDA Natural Resource Conservation Service office.



Document information below

Provide your own record with equivalent information.

2.2 Rootstock, Scion, and Clone Selection

Requirements

1. You must document rootstock, scion, and clone choices.



Indicate rootstock, scion, and clone combinations on the ranch map.

Document choices below or provide your own documentation with equivalent information.

2. Prior to planting previously cultivated agricultural land you must test for soil-borne pests.



Attach test records. Explain if land was not previously cultivated.

2.5 Tissue Analysis

Requirements

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1. You must provide tissue samples based on management zones from within the last 12 months.



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Attach analysis results from within the last year.

When were the tissue samples gathered?

2.6 Fertilization

Requirements

1. You must base **nutrient** applications on the vineyard's nutrient application plan including nutrient content from soil, water and tissue samples and timing to optimize utilization.



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Attach nitrogen or other nutrient budget.

Provide a written description of how your nutrient applications correlate with your nutrient budget.

When was the nitrogen / nutrient plan last updated?

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2. You must annually add organic matter to the soil, such as compost, manure, municipal green waste, green manure from your cover crop, and/or mulch. Organic matter must be managed in such a way to prevent the introduction of unwanted pests, pathogens, and weed species as well as to prevent nutrient leaching.



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Attach organic matter application records.

Provide written description of management practices that prevent the introduction of unwanted pests, pathogens, and weed species as well as prevent nutrient leaching.

When were the organic matter application records completed?

3 — Winery Facility Establishment and Management

Wineries come in all shapes, sizes, ages, and capabilities. While the basic focus on wine production unifies all wineries, the similarity often stops there. When a winery owner embarks on either new construction or remodels an existing facility, thought must be given to the site, design, materials, and how best to incorporate sustainable practices. Facility design and management practices affect both the local environment and people involved with the winery.

According to the American Institute of Architects, an estimated 25-40% of the entire United States national solid waste stream comes from construction-related waste (<http://www.aia.org/aiaucmp/groups/secure/documents/pdf/aiap072739.pdf> ()). Using alternative materials, recycling building waste, and overall using fewer materials are important steps in reducing construction impacts in landfills.

Much as in planning a vineyard, the winery site needs to take into account topography, weather patterns, and aspect in order to maximize efficiency. Wineries need to remain cool and utilizing site advantages, such as hillsides for underground storage rooms, can greatly assist with demands for cooling and humidification.

Incorporating natural light into workspaces has been shown to be important for overall worker health and productivity and also cuts down energy use (<http://www.northwestern.edu/newscenter/stories/2014/08/natural-light-in-the-office-boosts-health.html> ()).

It is important that wineries do their part to provide safe working environments for workers and to be good neighbors. Noise from equipment and operations must be managed to fulfill both of these aspects.

3.1 Facility Planning and Construction

Requirements

1. Your ventilation system(s) must be designed to handle all chemicals and gasses used in production. Describe the ventilation system.



 Onsite Inspection Required

4 — Vineyard Soil Conservation and Surface Water Quality

In order to maintain a long-term and thriving vineyard, growers must protect the resources necessary for plant life including land, soil, and water. Healthy soils are vital for optimal vine growth, development, and production. They play a critical role in determining site suitability, ease of establishment, and in maintaining healthy, balanced vines throughout the vineyard life. It is essential that vineyard owners and managers steward their soil and water resources effectively and consider the effects of management decisions and vineyard practices on soil characteristics and water quality.

Soil Conservation

Premium wine grapes are cultivated in a diverse array of soil types throughout the world. In order to protect and enhance these soil resources, growers must be knowledgeable about the unique soil characteristics specific to a given site. These characteristics include, but are not limited to the following: soil texture, structure, organic matter, pH, nutrient content, rooting depth, permeability, infiltration rate, and runoff rate. Soil structure and nutrient content affect vine health and vigor. In many cases, a healthy vine can tolerate more pest damage or compete better with weeds than a less healthy one; a vine is more likely to be “healthy” in healthy soils.

The objective of sustainable soil management is to understand soil characteristics as much as possible, to conserve and/or improve naturally occurring beneficial soil attributes, and use best management practices to correct any deficiencies in soil tilth, water quality, or nutrient status. In order to achieve this objective, growers and managers must take appropriate measures prior to planting a vineyard to reduce the need for avoidable soil management challenges later in the life of the vineyard. Once the vineyard is planted, it is necessary to monitor soil health routinely and correct deficiencies when necessary. Soil management can contribute significantly to vine health and premium wine grape production and should therefore be considered carefully when making vineyard management decisions.

Surface Water Quality

Growers who minimize their impacts beyond their fence line recognize that their farm is part of a larger, complex watershed. Almost every farming operation has consequences that can reverberate next door or even further downstream. Soil loosened by cultivation can escape with rainfall and add to stream sedimentation and increase nutrient concentrations that affect aquatic populations and impair receiving waters. In addition, this soil can carry other agricultural chemicals with it, transporting and depositing them downstream.

Farms no longer have just a street address they now have a watershed address. A watershed address represents the growers’ responsibility for eliminating off site movement of soil, chemicals, and pathogens, therefore eliminating impacts on downstream water bodies and ground water. Growers must understand that their farming decisions affect others in the watershed – they can no longer operate on the assumption that their practices only impact their property. Cultivation must be minimized or eliminated to reduce erosion. Cover crops must be present to help keep soils in place and promote biodiversity. The grower should select management practices that meet his/her management objectives with the least impact on the environment and human health. To the extent feasible, the grower should select a natural control mechanism. The grower should document the basis for his/her decision.

Soil and water are valuable resources that growers must respect, protect, and use responsibly. They are intimately related parts of the planet’s ecosystem and are directly responsible for sustaining all life. Sustainable growers make responsible choices that conserve soil resources -- choices based not just locally on their own farming operations, but holistically on the entire watershed of which they are a part.

Eliminating the risks of offsite movement of soil, water, and chemicals should be the goal of the vineyard manager.

Chapter notes for drought conditions

If the grower can document a lack of irrigation water due to serious drought, declared water emergency, or specific location with documented long term water issues, the Requirements and Management Enhancements for planting and maintaining cover crops and/or vegetative strips will be modified to meet pressing water sustainability issues on a case by case basis. Modifications must be discussed with SIP staff and approved by the Certification Advisory Committee at the beginning of the certification cycle.

4.1 Post-Plant/Purchase

Requirements

1. The soil must be sampled and tested at least every five years for nutrient content and monitored for pH, Electrical Conductivity (EC), and toxicities.



Attach results of soil samples within the last five years.

If toxicities or deficiencies were detected, describe action taken.

When were the soil samples last taken?

4.2 Erosion Control and Prevention of Offsite Movement

Requirements

1. You must know the watershed and subwatershed where your vineyard is located. (see EPA watershed (<https://cfpub.epa.gov/surf/locate/index.cfm>))



Specify watershed and subwatershed and attach map or documentation.

2. A winter cover crop (resident or planted) must be maintained.



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Photo(s) Required

Onsite Inspection Required

Provide close-up photo and large scale photo from a block level.

Describe winter cover cropping practices.

When were the photos last taken?

3. You must have a minimum of two management practices in place to minimize the offsite movement of sediment and organic soil amendments and to minimize non-point source pollution of surface waters.



Photo(s) Required

Onsite Inspection Required

☐ Cover crop (resident or planted)

☐ Filter Strip (resident or planted)

☐ Mulching

☐ Hay bales/straw

☐ Jute netting

☐ Silt pond

☐ Waddles

☐ Vegetated Ditches

☐ Other

Provide photo documentation for each selected.

If you selected other, describe.

4. You must have vegetated perimeter buffers of no less than 25 feet from the setback of perennial streams and/or wetland areas.



Onsite Inspection Required

Indicate perimeter buffers on ranch map. Not Applicable only if there are no perennial streams and wetland areas on the property.

Provide written statement.

5 — Water Conservation and Quality

In order for winegrowers to manage their water resources effectively and efficiently, they must understand the various issues affecting water use.

In the Vineyard

Irrigation management is one of the most effective tools of quality wine grape production and is one of the few inputs that the grower has significant control over. Irrigation decisions are influenced by a number of often interrelated factors including energy conservation, water conservation, water quality, water runoff and their related environmental impacts and regulations.

Proper irrigation design must account for several issues: water availability, soil type, terrain, climate, variety, rootstock, drainage/runoff, cultural practices, labor availability, fertilization requirements and backflow protection.

Optimizing irrigation operations requires not only an efficient design, but vigilant system maintenance, assessing pump characteristics, and ongoing consideration of soil water content and crop water requirements. Following installation, growers must maintain system hardware to achieve the highest distribution uniformity possible in order to ensure that vines receive equal amounts of water and to prevent the need for excessive run times. Using tools like pump efficiency and distribution uniformity tests on a regular basis will help identify problems within the system, which can then be addressed with the proper corrective actions.

Proper irrigation scheduling – matching the amount applied with the amount needed based on weather, soil capacity and water content, and plant requirements based on growth stage – is another important consideration when effectively and efficiently delivering water to the vines. There are many tools available to assist with irrigation scheduling, and each vineyard has different water requirements. Understanding these relationships allows the vineyard manager to apply water in the most effective manner possible, conserving water resources, minimizing or eliminating runoff, while producing premium fruit.

In the Winery

Water conservation is a reality for all businesses and is especially important in many wine-producing areas. While the exact amount of water necessary to make a bottle of wine may vary, it is known that conservation methods can significantly reduce the amount of water used in the winery.

Monitoring water use on a regular basis will allow timely response to leaks or inefficiencies. Water quality must also be addressed as it is in direct contact with people, equipment, winery surfaces and wine.

Wastewater, storm water, and groundwater management are important parts of the overall water equation and require monitoring and maintenance. Treating and using wastewater on site are opportunities for water reuse.

Water conservation efforts both in the cellar and laboratory are important as small changes can make a big impact in overall water use. Landscaping plans and irrigation maintenance are important so site beautification can be done in a water wise manner.

5.1 Vineyard Water Quality and Analysis

Requirements

1.

You must have a backflow prevention device installed on your well(s) or water source(s).






Provide photo documentation.



Photo(s) Required







Onsite Inspection Required

<p>2. Well heads must be protected from chemical contamination. (DPR Wellhead Protection Requirements (<a))<="" a="" href="https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwi01fnfspTYAhWoqlQKHUXSDekQFggnMAA&url=http%3A%2F%2Fwww.cdpr.ca.gov%2Fdocs%2Femon%2Fgrndwtr%2Fwellhead_protection.pdf&usg=AOvVaw3hLr79oxnTbS6QJOVj3hZE">)</p> <p></p> <p> Photo(s) Required</p> <p> Onsite Inspection Required</p>	<p>Provide photo documentation.</p> <p>Describe well head protection from chemical contamination.</p>
<p>3. Unused wells must be properly abandoned in accordance with state and county ordinances.</p> <p></p>	<p>Provide a written description of well abandonment actions. Not applicable only if you have no abandoned wells.</p>
<p>4. You must provide well water quality analysis from within the last five years.</p> <p></p>	<p>Attach analysis results from within the last five years.</p> <p>When was well water quality last analyzed?</p>

5.2 Vineyard Water Use Efficiency

Requirements

<p>1. You must test the irrigation system for distribution uniformity at least every five years by monitoring emitter outflows and pressure differences.</p> <p></p>	<p>Attach records of distribution uniformity tests.</p> <p>When was the irrigation system last tested for this?</p>
<p>2. You must use a low-volume irrigation system (drip or micro-sprinkler) for irrigating during the growing season.</p> <p></p> <p> Onsite Inspection Required</p>	<p>Provide a written statement of your low-volume irrigation system including emitter spacing, tube gauge and emitter flow rate.</p>
<p>3. You must inspect and clean the water filters at throughout the season.</p> <p></p> <p>D — Req'd for Documentation renewals</p>	<p>Attach records of filter inspections and cleanings.</p> <p>When were these records last completed?</p>

4. You must flush the irrigation lines at least annually throughout the irrigation season.



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Attach records of irrigation line inspections.

When was this last done?

5.3 Vineyard Irrigation Scheduling

Requirements

1. You must have soil based monitoring devices to track soil moisture depletion, or plant based monitoring devices to monitor the moisture status of your vineyard, or use evapotranspiration (ET) calculations and an ET budget as one of the tools to determine irrigation requirements.



List monitoring devices, either soil- or plant-based, and data from the previous year OR attach ET budget from previous year.

Attach ET budget from previous year.

When were the devices last used or ET budget compiled?

2. You must track total water the vineyard receives during the season from rainfall, frost protection, and irrigation.



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Attach records of total water received.

When were these records last compiled?

3. You must measure the effective rooting depth of your soils and estimate the vineyard's soil water holding capacity.



Provide written description of method used to determine the effective rooting depth and the results.

5.4 Winery Water Conservation

Requirements

1. You must record your monthly water use for the winery and tasting room (if applicable).



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Attach water use records.

2. You must check for water leaks at least monthly and report/repair immediately.



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Attach monitoring schedule and repair log.

5.5 Winery Water Quality

Requirements

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| 1. You must inspect and maintain your water treatment system throughout the year as required by your permit. | Attach maintenance logs and permit. |
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5.6 Wastewater Ponds and Process Tanks

Requirements

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| 1. You must have a wastewater measurement plan including measurement method and schedule or adhere to municipal regulations. | Attach plan. |
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| 2. Sumps and/or traps must be inspected monthly. | Attach maintenance records. |
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5.7 Winery Septic Systems

Requirements

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| 1. You must inspect your septic system every three years and maintain written operations and maintenance procedures. | Attach procedure and maintenance records.
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5.8 Winery Storm Water




Requirements

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| 1. You must map storm drains on a site map and show that they drain to known sources. | Attach map. |
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5.9 Winery and Lab Water Conservation

Requirements

1. Tanks and transfer lines must be cleaned and sanitized using a known quantity of water.	Attach tank cleaning and sanitizing protocol indicating how water use is measured.
	
2. Water for cleaning must be applied using a high-pressure/low-volume nozzle fitted with a shut-off valve.	Attach photo.
	
 Photo(s) Required	



5.10 Winery and Lab Sanitization

Requirements

1. You must pre-clean crush operations, equipment and floors using brushes, push brooms and/or squeegees in a timely fashion to prevent grape material from drying on equipment surfaces before wash-down.	Describe or attach pre-cleaning procedure.
	
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 Onsite Inspection Required	

5.11 Winery Landscaping

Requirements

1. You must do at least three of the following to prevent erosion on the grounds.	<input type="checkbox"/> Plant appropriate plant materials to slow or prevent water runoff <input type="checkbox"/> Use mulches, ground covers, or other semi-permeable materials to cover and retain soil <input type="checkbox"/> Replant bare soil as necessary <input type="checkbox"/> Use sand bags and fiber rolls when necessary to keep water from gaining speed, and to hold water on property <input type="checkbox"/> Use diversion ditches when necessary to keep water from gaining speed, and to hold water on property Check all that apply and describe measures taken.
	
 Onsite Inspection Required	

6 — Energy Conservation and Efficiency

Striving for energy conservation and efficiency should be the goal of every winegrower.

In the Vineyard

On-farm energy usage is of critical importance in today's environment of increased and uncertain fuel costs, additional scrutiny of greenhouse gas emissions, and concerns around air quality from engines. Vineyard operators must approach this situation with a rigorous and measured energy efficiency planning perspective. It makes good business sense to review all aspects of the vineyard operation to ensure that energy conservation is being practiced. This includes pursuing methods to increase the efficiency of equipment and modifying vineyard practices where appropriate to do so.

Equipment and pump operations are the highest energy usage components in the vineyard. Minimizing the number of hours equipment is used and the overall fuel use are key elements of an on-farm energy plan. Note that this also relates to the air quality management plan as discussed in the next chapter. Alternatives to diesel should be evaluated both from an efficiency and emissions standpoint. Regular equipment maintenance schedules help ensure optimal operating efficiencies. Replacing older less efficient motors and equipment should be considered. Efficient and "greener" technologies (e.g., solar and wind) are being developed and are being used in an increasing number of farming operations.

Irrigation systems are a key energy consumer in the vineyard. Coupled with water conservation and efficiency practices described in the previous chapter, system designers should also target minimizing energy usage and air pollution. This can be achieved by collectively matching the designed water delivery system needs to the peak efficiencies of the pump/engine or pump/motor system. If an electric motor is used, a motor should be selected that will run at the desired speed or, if the pump speeds need to vary, the motor should include a programmable variable frequency drive (VFD).

For those vineyards with a shop, office facility and/or winery, there are a number of ways to conserve energy. Often local utility companies will provide energy auditing services (or direct you to companies that will) which can help individual operations identify and maximize opportunities to conserve energy and increase efficiency.

In the Winery

The consumption of energy inevitably comes at a cost and the goal of a sustainable winery is to minimize that cost in financial, ethical, and environmental realms. Energy efficiency is paramount and a critical first step in addressing energy use. Energy conservation can be achieved through efficient and judicious energy use.

A thorough energy use audit will facilitate an efficiency roadmap for each unique winery. Regular monitoring of energy use will capture both seasonal swings and potential equipment malfunctions.

Refrigeration is often one of the largest uses of energy in the winery. Insulating tanks and lines as well as utilizing alternatives to refrigerated cold stabilization will lower energy use.

Properly sized equipment and HVAC systems can increase their longevity and decrease energy consumption. Regular cleaning and maintenance of facility equipment is necessary to run at peak efficiency.

Energy-efficient lighting is widely available and new technologies are continually being developed to maximize lighting efficiency. The use of thermostats and automatic controls can reduce unnecessary energy consumption.

Alternative sources of energy are becoming widespread and more advanced in their technology. Switching to or incorporating energy from sources other than non-renewable fossil fuels has far-reaching impact.

6.2 Refrigeration

Requirements

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| 1. The chiller system must be designed and sized appropriately for your winery. | Describe how the chiller system was selected. |
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 Onsite Inspection Required

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| 2. You must employ measures to reduce chiller loads (e.g. building and tank insulation, night air cooling, off-peak evaporative cooling). | Describe how chiller loads are reduced. |
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| 3. You must inspect your refrigeration system weekly and keep inspection logs when in use. | Attach inspection logs. |
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6.3 Tanks and Lines

Requirements

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| 1. All hot water pipes and glycol transfer lines must be insulated with at least one inch thick insulation. | Attach photo(s). |
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 Photo(s) Required

 Onsite Inspection Required

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| 2. At least 85% of outside, jacketed fermenters must be insulated. Not applicable only if you do not have jacketed fermenters outside. | Attach photo and list percent of outside insulated fermenters by volume, describe jacketing material, and R-value of insulation. |
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 Photo(s) Required





 Onsite Inspection Required

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| 3. Tanks must be inspected for coolant leaks and leaks must be recorded and promptly repaired. | Attach inspection procedure. |
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6.4 Pumps, Motors, Drives, Air Compressors, and Dryers

Requirements

1. Well and pump performance must be tested at least every three years.	Attach most recent pump efficiency test results. When were the pump tests last completed?
	
2. Air compressors must be sized correctly and provide your winery with efficient and optimal performance.	List air compressor associated with winery operations and describe how you determine appropriate sizing for your needs.
	
 Onsite Inspection Required	
3. Air compressors must be turned off when not in use.	Describe procedure.
	


6.5 HVAC

Requirements

1. You must reduce heating and cooling loads by utilizing at least four of the following:	<input type="checkbox"/> Temperature controlled cellars <input type="checkbox"/> Louvered ventilation panels <input type="checkbox"/> Timed automatic door openers <input type="checkbox"/> Insulated doors/roll-up doors <input type="checkbox"/> Strip doors/high-speed roll-up doors <input type="checkbox"/> Weather stripping
	
 Onsite Inspection Required	
2. You must have a schedule for regularly cleaning/replacing air filters and condenser coils.	Attach maintenance schedule.
	

6.6 Lighting

Requirements


1. At least 50 percent of electric lighting must be from energy-efficient bulbs (e.g. LED).	Describe energy-efficient bulb use and provide a written procedure to use energy efficient bulbs as existing bulbs expire.
	

6.7 Thermostats

Requirements

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1. All temperature controlled rooms, including office and hospitality spaces, must have functioning thermostats that are programmed to conserve energy.



 Onsite Inspection Required

Attach procedure for room thermostats.

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2. Heating and cooling jackets must be turned off when tanks are not in use.



Attach procedure.

7 — Pollution and Waste

It is to the winegrowers’ own benefit to stay up to date and alert regarding any and all pollution, waste, and air quality regulations.

In the Vineyard

In order for growers to minimize their effect on the environment, they must understand how their farming practices affect air quality. Agricultural air quality concerns generally focus on diesel particulate matter, dust production and sulfur dust use. One way growers can address diesel particulate matter is to exchange diesel engines for electric or clean burning engines. Programs exist to assist growers with exchanging polluting engines for ones that contribute to cleaner air. Growers can also change their cultivation practices, soil cover, and road maintenance to reduce dust production.





In the Winery

While some waste generation is an inevitable part of production, efforts to reduce waste are exceedingly important. Pollution in the air, on the ground, and in waterways must be avoided.

Procedures regarding hazardous and solid waste management, including storage, use, disposal, and emergency plans for both, are necessary for a sustainable operation. Filtration materials must be handled and disposed of properly. Cellar sanitation, lab chemicals and cleaning agents need to be labeled, stored, and disposed of appropriately.



7.1 Vineyard Air Quality

Requirements

1.	You must have a written program to eliminate offsite spray drift.	Provide written spray program.
		
2.	You must have speed limit signs posted on main vineyard access roads to reduce dust.	Y N na Indicate speed limit signs on ranch map or attach photo.
		
	 Photo(s) Required	
	 Onsite Inspection Required	

7.2 Pollution

Requirements

1.	You must have annual trainings and/or signs posted in the language understood by your worker(s) explaining practices to prevent litter, debris, soil, and pollution from reaching storm drains and streams.	Attach photo of signs and/or training logs.
		
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	 Photo(s) Required	

2. You must have a maintenance schedule in place to regularly check and maintain storm drains and basins.

Attach maintenance schedule.



7.3 Hazardous Material Management

Requirements

1. You must perform an annual hazardous material and waste assessment.

Attach recent assessment.

When was this assessment last completed?



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2. You must have written procedures for addressing chemical spills, hazardous material, and emergency situation management and conduct annual worker training.

Y N

Attach chemical spill procedure and training logs.



When were the training logs last updated?

3. You must label, store and dispose of chemicals, solvents, lubricants, coolants, batteries, oils, paints, florescent lighting ballasts, and coatings properly and train employees on hazardous waste handling and disposal.

Include employee training information.



4. You must store hazardous materials in a safe, secure location and use oldest materials first.

Indicate storage location on a facilities map.



🔍 Onsite Inspection Required

5. All lubricants and wine production contact surfaces must be food grade.

List products used.



🔍 Onsite Inspection Required

7.4 Winery Solid Waste Management

Requirements

1. You must have a written procedure addressing organic solid waste.

Attach procedure including which materials are disposed of, composted, used for farm feed, fertilizer or other use.




7.5 Winery Cleaning and Sanitizing Agents

Requirements

1. Cleaning chemicals must be clearly marked and stored in a clean, dry location in appropriate secondary containment and stored separately from wine addition chemicals.

Attach photos of chemical containers and show locations on facility map.



 Photo(s) Required

 Onsite Inspection Required

7.6 Lab Chemicals

Requirements

1. You must have a program in place listing all reagents and chemicals used in the lab and their proper disposal method as per MSDS/SDS.

Attach list and disposal procedure.




 Onsite Inspection Required

2. All laboratory chemicals must be labeled and stored in appropriate, marked areas. Flammables, acids and bases must be stored separately.

Attach photos of laboratory chemical storage areas.



 Photo(s) Required

 Onsite Inspection Required

3. Personal Protection Equipment (PPE) must be a part of written laboratory procedures for each analysis and chemical solution preparation.


Attach procedures.



4. Chemicals removed from their original containers must be properly re-labeled.

Attach photo.



 Photo(s) Required

8 — Purchasing, Recycling, and Waste Reduction


Where you spend your money makes an impact. Having a purchasing plan that favors environmentally friendly materials sourcing, production, packaging, and shipping sends a message to both businesses and consumers that these methods matter. Inquiring about the packaging methods and recyclability of packaging materials used by vendors also encourages others to thoughtfully consider their own practices.

Overall waste reduction efforts and reusing or recycling all possible items will have lasting impact towards achieving the goal of less material heading into the waste stream.

8.1 Recycling

Requirements


1. You must have a written recycling program including but not limited to paper, plastic, oil containers, oil filters, tires, batteries, and pesticide containers and educate your workers on your program.	Y N Provide written description and attach worker training.
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8.2 Waste Reduction

Requirements


1. You must have a written waste reduction policy including targeted goals to reduce overall waste production.	Attach waste reduction policy.
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8.3 Packaging and Materials

Requirements

1. You must have a written policy outlining when and how to distribute promotional materials (e.g. press packets, price lists) and do so electronically whenever possible.	Attach policy.
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2. You must use at least 50% recycled content in your paper packaging materials (e.g. case boxes, labels, etc.).	Attach documentation.
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9 — Pest Management

A winegrowers' goal is to establish an Integrated Pest Management system to deter and manage pest issues in the most ecologically safe way.

In the Vineyard

In order for growers to protect their crop, they must manage the dynamic pest complex to minimize economic damage. The use of pesticides is one of the major challenges facing agriculture today. Public perception, worker safety, as well as state and federal regulation provide challenges to growers using pesticides.

Pest management, rather than pest control, is the focus of a sustainable farming operation. Integrated Pest Management (IPM) has been actively practiced since the 1960s and is a crucial part of vineyard management. Major advances have been made in the last 40 years to assist today's viticulturist in this arena.

The vineyard manager must consider several issues when deciding if and when a pest needs to be controlled. The stage in the pest's life cycle, abundance of beneficial insects, economic thresholds, potential crop injury, chemical alternatives, water quality impact, and potential impacts on non-target organisms are just a few factors to be considered when addressing pest management issues. The use of intensive field scouting, disease modeling, and insect trapping are necessary tools for managing vineyard pests.

Use of the proper equipment for management is also an important factor. Controlling weeds, root insects, canopy insects and diseases all require different scouting approaches and have different equipment needs. The vineyard manager must be knowledgeable about all the facets of these unique challenges.

In addition, trellis type, plant material, canopy management, vineyard floor management, fertilization, and irrigation are all factors that must be taken into account to prevent, mitigate, or manage pest, weed, and disease outbreaks.

Sustainable vineyard management addresses overall balance, and dealing with pests is no different. Giving attention to the interactions of irrigation, soils, cover crop, and canopy factors with pests is key; it allows for a comprehensive approach to maintain the balance of the whole farm system.

The Vineyard Team Technical Committee supports and encourages low-input farming practices. The standards are considered a "living document" meaning they will evolve over time as new science and technology develops and becomes available. Requirements include a Prohibited Materials List (listed by active ingredient) based on the Department of Pesticide Regulation's following lists: Groundwater Protection, Cholinesterase Inhibiting, Toxic Air Contaminants, California Restricted Materials and Federally Restricted Materials Lists. In order to achieve certification, a grower must not use any of the active ingredients on this list. In the area of chemical use, growers should strive to limit their inputs and impacts.





In the Winery

Pest management is a reality for all property owners, using Integrated Pest Management practices to deter pests can decrease unwanted populations.

Reduction or elimination of chemicals for pest management is important for both employee and ecological safety. Increased demand for alternatives to toxic chemicals for pest control fuels innovation and strengthens the need for these services.


9.1 Vineyard Best Management Practices

Requirements

<p>1. No Active Ingredients (AI) on the Prohibited Materials List (PML) (../../prohibited-materials) can be used. Records are required for all certified acres (December-June/July).</p> <p></p> <p>D — Req'd for Documentation renewals</p>	<p>Attach December 1 to June/July pesticide use reports with trade names and active ingredients listed. June/July to November pesticide use reports due December 15.</p> <p>When were the first set of pesticide use reports completed?</p>
<p>3. You must monitor and record the following:</p> <ul style="list-style-type: none"> • Population dynamics of vineyard pests and insect/mite natural enemies at a minimum of every week during the vineyard growing season • Presence and severity levels of diseases or disease vectors at a minimum of every two weeks during the vineyard growing season • Presence and severity levels of weeds at least once per month • Presence and identification of vertebrate pests at least once per month <p></p> <p>D — Req'd for Documentation renewals</p>	<p>Attach Records.</p> <p>Describe your monitoring program.</p> <p>When were records last updated?</p>
<p>4. The sprayer must be calibrated annually, adjusted and recalibrated for changing vineyard conditions; worn screens and nozzles must be replaced in order to insure the best coverage and efficacy of agricultural chemical applications.</p> <p></p>	<p>Attach calibration records.</p> <p>When were your calibration records completed?</p>
<p>5. Pesticides (insecticides, fungicides, and herbicides) with different modes of action must be alternated within the seasonal spray program in order to minimize the risk of pesticide resistance development.</p> <p></p> <p>D — Req'd for Documentation renewals</p>	<p>Attach spray records which include target pest, disease, or weed and pesticide mode of action.</p> <p>Provide an example from your vineyard.</p> <p>When were your spray records completed?</p>

9.2 Insect, Mite and Nematode Pest Management

Requirements

<p>1. Key workers must be knowledgeable about the insect, mite, and nematode pests found in your vineyard, including understanding the pest's life cycle and natural enemies (predators, parasites, or pathogens) to make management decisions.</p> <p></p>	<p>List the most significant insect, mite and/or nematode pests found in your vineyard, and give a brief description or diagram of their lifecycle and an example of a natural enemy.</p>
--	---

9.3 Beneficial Insect Management

Requirements

1. Key workers must be knowledgeable about the life cycle and habitat requirements of, and environmental conditions favorable to, predators and parasitoids that are the natural enemies of pests to make management decisions.



List the natural enemies, including life cycle, habitat requirements, for the pests you listed in Requirement 9.2.1.

9.4 Disease Management

Requirements

1. Key workers must be knowledgeable about the diseases that are likely to be found in your vineyard, including knowledge of the life cycle and vectors of the causal agent, and predisposing factors for infection and disease epidemiology to make management decisions.



List the key diseases found in your vineyard. Provide a diagram or written description of the disease's life cycle, vectors, and other predisposing factors.

9.5 Weed Management

Requirements

1. Key workers must be knowledgeable about the weed species common in your vineyard and their most susceptible life stage to make management decisions.



List key weed species found in your vineyard and their most susceptible life stage.

9.7 Winery Pest Management

Requirements

1. You must have an Integrated Pest Management (IPM) system. This should include a list of winery pests, monthly monitoring, and strategies for prevention and control.



Attach plan.

10 — Grape Sourcing and Fruit Quality

Growing and using quality wine grapes is essential to a winegrower’s long-term profitability.

In the Vineyard

Practices such as vineyard development, soil and fertility management, viticulture practices, and fair treatment of employees have been addressed throughout the Standards. Each of these considerations contributes an additional layer to a quality product. Through whole farm system management, wine grape growers can produce quality fruit grown in a biologically diverse agricultural ecosystem. Fruit quality is determined over the course of many seasons and is affected by numerous factors. Quality is the result of viticultural practices such as pruning, canopy management, and fruit thinning; irrigation and water management; soil and fertility management; effective pest and disease management; harvest decisions, and more. It is important for growers to evaluate fruit quality indicators (including but not limited to Brix, pH, and TA). Evaluating annually allows the producer to analyze maturity parameters and use those results to adjust the farming practices during the next season.



In the Winery

Maintaining healthy relationships with grape growers, whether they are farming an estate vineyard or contracted grapes, is beneficial to both growers and wineries.

Fruit quality must be measured against contracts and/or winemaking protocols in order to meet desired parameters for the target wine quality level. Requesting or mandating that growers farm sustainably further adds to the reach of winery sustainability initiatives and sends a clear business message.

10.1 Fruit Quality

Requirements

1. You must record fruit quality parameters on an annual basis, including Brix, pH, and TA.	Provide fruit quality parameter records from the previous year.
	When were your records completed?
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2. You must have receiving records for all grapes received.	Attach three samples of grape receiving records.
	

11 — Social Equity

The Social Equity section is designed to be completed based on policies toward workers. A worker is defined as any person (both in house and contractor provided labor) working at your winegrowing operation at any point during the year.

One of the three major tenets of sustainability is social equity. The health and wellbeing of all people connected to the business, not just employees, is as important as the health of the environment and the business enterprise itself.

In the Vineyard

In order for winegrowing businesses to be truly sustainable, they must provide a safe and fair working environment for their employees and interact successfully with the surrounding community. These goals can best be achieved when winegrowing businesses are realistic about the challenges they face, forthright in their communication with both groups, and incorporate social equity issues as an integral part of their sustainable practices.

A safe and fair work environment is particularly important in winegrowing businesses where a heavy reliance has been placed on human labor. The interaction between winegrowing business owners, community leaders, concerned citizens, and winegrowing workers offers the sustainable winegrowing employers the opportunity to continue to develop and continuously implement safety programs, effective communication with their workers, and fair employment practices that eliminate discrimination. Providing fair compensation, rewarding workers for superior performance, and providing competitive benefits can promote a positive work environment where emphasis is on accomplishment. In order to promote a positive work environment, winegrowers should understand cultural issues and emphasize an open dialogue between worker and employer.

Positive interaction between winegrowing businesses and their urban and non-urban neighbors is critically important to sustainable winegrowing. An honest interchange of information is essential. Educating surrounding communities regarding SIP Certified, Integrated Pest Management (IPM), and sustainable wine making practices will help mitigate ag-urban interface issues. When winegrowers provide their community a clear picture of how their sustainable practices enhance and protect the neighboring environments they preempt misunderstanding and unwarranted fear. Not only do winegrowers need to practice good stewardship of their human and natural resources, they need to communicate these efforts to the community at large. A properly managed vineyard or winery is a healthy sustainable ecosystem that provides environmental, economic, and social benefits that reach well beyond the borders of that operation.

11.1 Worker Orientation and Human Resources Policies

Requirements

- | | |
|---|---|
| <p>1. You must include the following within the Employee Handbook(s) and provide a copy to each new employee:</p> <ul style="list-style-type: none">● Harassment Policy● Salary, Benefits, and Incentives● Employee Orientation● Ongoing Training● Employee Safety Policies and Practices● Employee Evaluations, Grievance Policy and Disciplinary Actions | <p>Provide copy of Employee Handbook.</p> |
|---|---|



2. You must develop and implement a safety program addressing injury and illness prevention including the following:
- A system for ensuring that employees comply with safe and healthy work practices
 - A system for communicating with employees on safety and health matters, including provisions designed to encourage employees to report hazards without fear of reprisal
 - Procedures for identifying hazards including scheduled periodic inspections
 - A procedure to investigate occupational injury or occupational illness
 - Methods and/or procedures for correcting unsafe or unhealthy conditions
 - Provide training and instruction to employees and supervisors to familiarize them with the hazards to which employees under their control may be exposed



Attach the program and Identify the person(s) with authority and responsibility for implementing the program.

3. All new employees must receive an introduction to the company prior to starting work. Company introduction includes, but is not limited to:
- Long and short term work goals
 - Benefits and eligibility requirements
 - Policies
 - Job descriptions



Provide documentation of employee orientation meeting and employee manual in a language understood by the employee(s).

4. Management training seminars concerning workplace harassment and discrimination must be conducted at least every two years. Attach training records.



Y N
Attach verification form or other proof of attendance.

When was the most recent seminar held?

5. If your employees are minors (17 years of age or younger) you must do the following:
- Prevent children under the age of 13 in an Agricultural Zone of Danger
 - Ensure minors work days and hours in compliance with requirements of state and federal regulations
 - Obtain and have on file a work permit from each minor any time of year



Attach copy of work permit.

6. If you pay a piece rate, you must have a mechanism to properly compensate break time.



Provide documentation.

If you do not pay piece rate, explain.

11.2 Worker Development and Ongoing Training

Requirements

- | | |
|---|---|
| 1. Employee safety trainings must be given every time an employee starts work and/or enters a new working environment. Training meetings include: <ul style="list-style-type: none">● Personal hygiene● Daily change of clean clothing● Recognizing and avoiding unsafe working environments or conditions● Safe use and handling of pesticides for handlers and applicators● Pesticide safety and awareness● Pesticide use notification● Heat illness prevention● Equipment and ergonomics● Other types of ergonomic/musculoskeletal safety issues (lifting, carrying, etc.) | Provide documentation of employee safety training meetings. |
|---|---|



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- | | |
|---|--|
| 2. You must provide annual training on confined space, fall protection, heat stress prevention, respiratory/pesticide awareness and ammonia safety (if applicable), and biannual forklift training. | Attach training records from the past 12 months. |
|---|--|



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11.3 Safe Work Environment

Requirements

- | | |
|--|--|
| 1. You must have a written Emergency Preparedness and Evacuation Plan including but not limited to: <ul style="list-style-type: none">● Internal and external contact information (e.g. 911, doctor, ambulance, fire department, hospital, urgent care)● Employee contact information● Location of nearest phone (phone must be accessible at all times)● Location of emergency exits | Attach Emergency Preparedness and Evacuation Plan and annual training records. |
|--|--|



2. Facilities must have warning signs for all potential hazards (e.g. chemical storage areas, electrical equipment, fuel tanks, toxic material, etc.) posted in the language understood by your worker(s).

Y N
Attach photo(s).



3. You must inspect and record the following:

Attach inspection records.

- Daily forklift log
- Secured storage of compressed gas cylinders (daily when used)
- Equipment safety checks at least monthly (seasonally for equipment used annually)
- Eye wash and shower station inspections at least monthly (if applicable)
- First Aid kit inspection and restocking at least quarterly
- Fire extinguisher inspections monthly and recharge at least annually
- Fire suppression system inspection at least annually



4. You must test your facility for noise output every three years during peak daytime and nighttime operations. Noise 100 feet away from the facility must be kept below 45dB Hourly Equivalent Sound Level between the hours of 10pm and 7am. Submit by **December 15**.

Attach documentation showing noise levels at the facility and 100 feet away.



5. Hearing protection must be provided to employees exposed to noise levels above 80dB.

Document what type of hearing protection is provided.



6. If your wells are used for drinking water, you must conduct drinking water suitability tests at least every three years. If water quality does not meet suitability test you must provide an alternative source of drinking water or take corrective action.

If applicable, provide copies of the sampling results and alternate source/corrective action, if needed.

When were the water suitability tests completed?



11.4 Community Involvement

Requirements

1. You must have a plan in place that addresses neighbor and community communication. Plan must include:

Attach written plan.

- Participation in neighbor and community forums
- Notification of major changes to practices
- Procedures for neighbors to express their concerns regarding farming practices
- Program addressing the proper use of bird frightening devices including neighbor considerations (if applicable)
- Procedures to log and follow-up on neighbor and community complaints
- Worker training regarding the neighbor and community communications program



2. You must train tasting room and/or sales workers on how to communicate your sustainable practices to customers.

Attach training records.



12 — Continuing Education



New technologies for sustainable winegrowing are constantly being adopted by the industry. Continuing Education (CE) programs are important for both small and large vineyard and winery owners and managers to improve practices, enhance worker safety, and reduce environmental impacts. CE credits are available from a wide range of organizations on topics including worker safety procedures, pest and disease management, wine quality, regional and statewide laws and regulations, personnel management and the latest research results in viticulture and oenology. Credits in CE are also required for many license holders, such as Pest Control Advisors, Private Applicators, and Certified Crop Advisors.

Continuing Education is available through a variety of organizations including the Vineyard Team (VT), local Vintner's and Grower's groups, and statewide groups, universities, and the California Association of Pest Control Advisors (CAPCA). Winegrowers must take advantage of opportunities to educate themselves over the length of their career and seek deeper knowledge of wine growing and making practices, from pre-plant habitat conservation to water savings in the winery, and everything in between. In addition, owners and managers must remain open to alternative and innovative practices being developed within the industry in order to compete in both the local and world markets.

Continually seeking new information and resources regarding every aspect of winegrowing operations should be the goal of managers.

12.1 Continuing Education

Requirements





<div>1.</div> <div>You must participate in at least 20 hours (40 hours if certifying both vineyard and winery) of continuing education pertaining to farming, winemaking, business practices and/or sustainability issues each year.</div>	<div>Attach Continuing Education verification forms totaling 20 hours from the past 12 months.</div> <div>When was the Continuing Education completed?</div>
<div></div> <div>D — Req'd for Documentation renewals</div>	
<div>2.</div> <div>You must have a procedure in place to maintain your certification including personnel responsible for certification compliance, contact information, database login information, documentation maintenance and deadlines.</div>	<div>Attach procedure.</div>
<div></div>	

13 — Business Management

A healthy, functioning business is a critical component of a sustainable operation. A business must be economically viable to be sustainable long term. Budgets are a critical tool for every operation and are required for certification. Other issues related to the economic aspect of sustainability include succession planning, actual to budget comparisons, long-term financial planning, record keeping, information technology security, and inventory management.

13.1 Economic Viability

Requirements

1.	You must have an annual or multi-year budget.	Provide documentation of the budget. You do not need to disclose sensitive financial information.
		Indicate the year the budget is for; any date.
3.	You must have a sales and marketing plan.	Attach plan.
		
4.	You must document that winery records are maintained (e.g. analysis, work completed, additions, wine tracking by lot and bottling).	Name the method or program you use and provide an example of your records.
		
5.	You must have an inventory management system for dry goods and additives, bulk wine, and case wine.	List system used and provide a copy of most recent inventory.
		

14 — Year End Water and Nitrogen Use Reports

- Chapter 14 Year End Reports are due by **December 15** of the certification year for all acres in the program.
- Calculations include water and nitrogen use from December 1 through November 30 of the certification year.
- Calculations are on a per acre basis.
- Attach documentation and/or calculations with specified units.
- You can use the Water and Nitrogen Use Report Workbook (http://www.vineyardteam.org/files/resources/Water%20and%20Nitrogen%20Use%20Reports_SIP%20Certified%20Ch.%2014.xlsx) to complete your calculations.

14.1 General Parameters

Requirements

-
- | | | |
|----|------------|----------|
| 1. | Total Area | In Acres |
|----|------------|----------|



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-
- | | | |
|----|-------------|---------|
| 2. | Total Yield | In Tons |
|----|-------------|---------|



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14.2 Water Use Report

Requirements

-
- | | | |
|----|--------------------------|------------|
| 1. | Applied Irrigation Water | (ac-ft/ac) |
|----|--------------------------|------------|

To convert water units per acre to acre feet, download the UCCE Irrigation Converter (<http://cesanluisobispo.ucanr.edu/files/164586.xlsx>).

Explain



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- | | | |
|----|---------------------|------------|
| 2. | Applied Frost Water | (ac-ft/ac) |
|----|---------------------|------------|

Explain

To convert water units per acre to acre feet, download the UCCE Irrigation Converter (<http://cesanluisobispo.ucanr.edu/files/164586.xlsx>).



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3. Rainfall (ac-ft/ac)

Example: Inches per acre can be converted to acre feet per acre by dividing by 12.

Explain

$$\frac{10.7 \text{ in/ac}}{12.0 \text{ in/ac-ft}} = \frac{0.89 \text{ ac-ft}}{\text{ac}}$$



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14.3 Nitrogen Use Report

Requirements

1. Fertilizer (Lbs N/ac)

Example for Solid Fertilizer: Ammonium sulfate [(NH₄)₂SO₄] fertilizer contains 21% N or 0.21 lbs N/lb of fertilizer. If 100 lbs of ammonium sulfate are applied per acre, the total N application is 21 lbs/acre.

Explain

$$\frac{100 \text{ lbs (NH}_4\text{)}_2\text{SO}_4}{\text{ac}} \times \frac{0.21 \text{ lbs N}}{1.0 \text{ lb (NH}_4\text{)}_2\text{SO}_4} = \frac{21 \text{ lbs N}}{\text{ac}}$$

Example for Liquid Fertilizer: Ammonium nitrate liquid fertilizer (AN 20) has a density of 10.76 Lbs/gal, and 21% nitrogen.

$$\frac{10.76 \text{ lbs}}{\text{gal of fertilizer}} \times \frac{0.21 \text{ Lbs N}}{\text{lb of fertilizer}} \times \frac{5 \text{ gal applied fertilizer}}{\text{ac}} = \frac{11.3}{\text{ac}}$$



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2. Compost

(Lbs N/ac)

Explain

Presumptions (if not provided by your producer or lab): Two methods are presented below for converting compost applications per acre to lbs N per acre. The presumption for %N availability is based on an industry standard of 30% (0.30) availability of total N content of compost, and an average weight of 900 lbs per cubic yard of compost.

Example for Tons/Acre Compost Applied: Wet (as is) compost with 1.7% N content, applied at a rate of 5 tons per acre.

Step 1: Convert %N content to lbs N per ton of compost.

$$\frac{1.7 \text{ lbs N}}{100 \text{ lbs}} \times \frac{2000 \text{ lbs}}{\text{ton of compost}} = \frac{34 \text{ lbs N}}{\text{ton of compost}}$$

Step 2: Convert lbs N per ton of compost to lbs available N per ton of compost.

$$\frac{34 \text{ lbs N}}{\text{ton of compost}} \times \frac{0.30 \text{ lbs available}}{1 \text{ lb total N}} = \frac{10.2 \text{ lbs available}}{\text{ton of compost}}$$

Step 3: Multiply lbs of available N per ton by total tons applied per acre.

$$\frac{10.2 \text{ lbs available N}}{\text{ton of compost}} \times \frac{5 \text{ tons compost}}{\text{ac}} = \frac{51 \text{ lbs N}}{\text{ac}}$$

Example for Cubic Yards (CY)/Acre Compost Applied: Wet (as is) compost with 1.7% N content, applied at a rate of 5 cubic yards per acre.

Step 1: Convert %N content to lbs N per cubic yard of compost.

$$\frac{1.7 \text{ lbs N}}{100 \text{ lbs compost}} \times \frac{900 \text{ lbs}}{\text{cy of compost}} = \frac{15.3 \text{ lbs N}}{\text{cy of compost}}$$

Step 2: Convert lbs N per cubic yard of compost to lbs available N per cubic yard of compost.

$$\frac{15.3 \text{ lbs N}}{\text{cy of compost}} \times \frac{0.30 \text{ lbs available N}}{1 \text{ lb total N}} = \frac{4.6 \text{ lbs available N}}{\text{cy of compost}}$$

Step 3: Multiply lbs of available N per cubic yard by total cubic yards applied per acre.

$$\frac{4.6 \text{ lbs available N}}{\text{cy of compost}} \times \frac{5 \text{ cy of compost}}{\text{ac}} = \frac{23 \text{ lbs N}}{\text{ac}}$$



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3. Water

(Lbs N/ac)

Explain

Presumptions: Two methods are presented below for converting irrigation water applications per acre to lbs N per acre. Nitrogen content of water is most commonly reported in ppm NO₃ or ppm NO₃-N. NO₃ is converted to lbs N/acre foot of water by multiplying by 0.62. NO₃-N is converted to lbs N/acre foot of water by multiplying by 2.74. A detailed description of these conversion factors can be viewed online (<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=7744>).

Example for lab report of ppm NO₃: Report from lab shows 45ppm NO₃ and a total of 0.89 acre feet (ac-ft) of irrigation water was applied.

Step1: Convert ppm NO₃ to lbs N/acre foot of irrigation water applied.

$$45 \text{ ppm NO}_3 \times 0.62 = 27.9 \text{ lbs N/ac-ft}$$

Step 2: Multiply lbs N/ac-ft by total irrigation water applied per acre.

$$\begin{array}{ccccc} 27.9 \text{ lbs N} & \times & 0.89 \text{ ac-ft irrigation water} & = & 24.8 \text{ lbs N} \\ \text{ac-ft} & & \text{ac} & & \text{ac} \end{array}$$

Example for lab report of ppm NO₃-N: Report from lab shows 45ppm NO₃-N and a total of 0.89 acre feet (ac-ft) of irrigation water was applied.

Step1: Convert ppm NO₃-N to lbs N/acre foot of irrigation water applied.

$$45 \text{ ppm NO}_3 \times 2.74 = 123.3 \text{ lbs N/ ac-ft}$$

Step 2: Multiply lbs N/ ac-ft by total irrigation water applied per acre.

$$\begin{array}{ccccc} 123.3 \text{ lbs N} & \times & 0.89 \text{ ac-ft irrigation water} & = & 109.7 \text{ lbs} \\ \text{ac-ft} & & \text{ac} & & \text{ac} \end{array}$$

*Efficiency of fertilization and of irrigation are not factored into the above equations.



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