Water Conservation Practices in Winery & Vineyard Operations

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Facts about Niner

- The winery building was awarded LEED certification at the 'Silver' level in 2011. This was the first winery to receive this certification in San Luis Obispo County and the fourth in the state (at that time)
- The vineyards have been SIP (Sustainable in Practice) certified since 2012
- The vineyards are in organic transition since 2017. Looking to complete certification in 2020 through CCOF (California Certified Organic Farmers)
- Treats and recycles all water used in the winery and repurposes it to the vineyard
- Collects all rainfall landing on the winery roof and around the winery for future use in the vineyard

What is LEED?

- **LEED**, or **Leadership in Energy & Environmental Design**, is a globally recognized symbol of excellence in green building, under the **United States Green Building Council**.
- **LEED** certification ensures electricity cost savings, lower carbon emissions and healthier environments for the places we live, work, learn, play and worship. LEED's global sustainability agenda is designed to achieve high performance in key areas of human and environmental health, acting on the triple bottom line - putting people, planet and profit first.
- **LEED credits** are awarded by third-party technical reviewers; are applicable to all building types throughout a building's lifecycle; and are developed through several rounds of public comments and in collaboration with the U.S. Green Building Council's (USGBC) board, broader membership and staff.

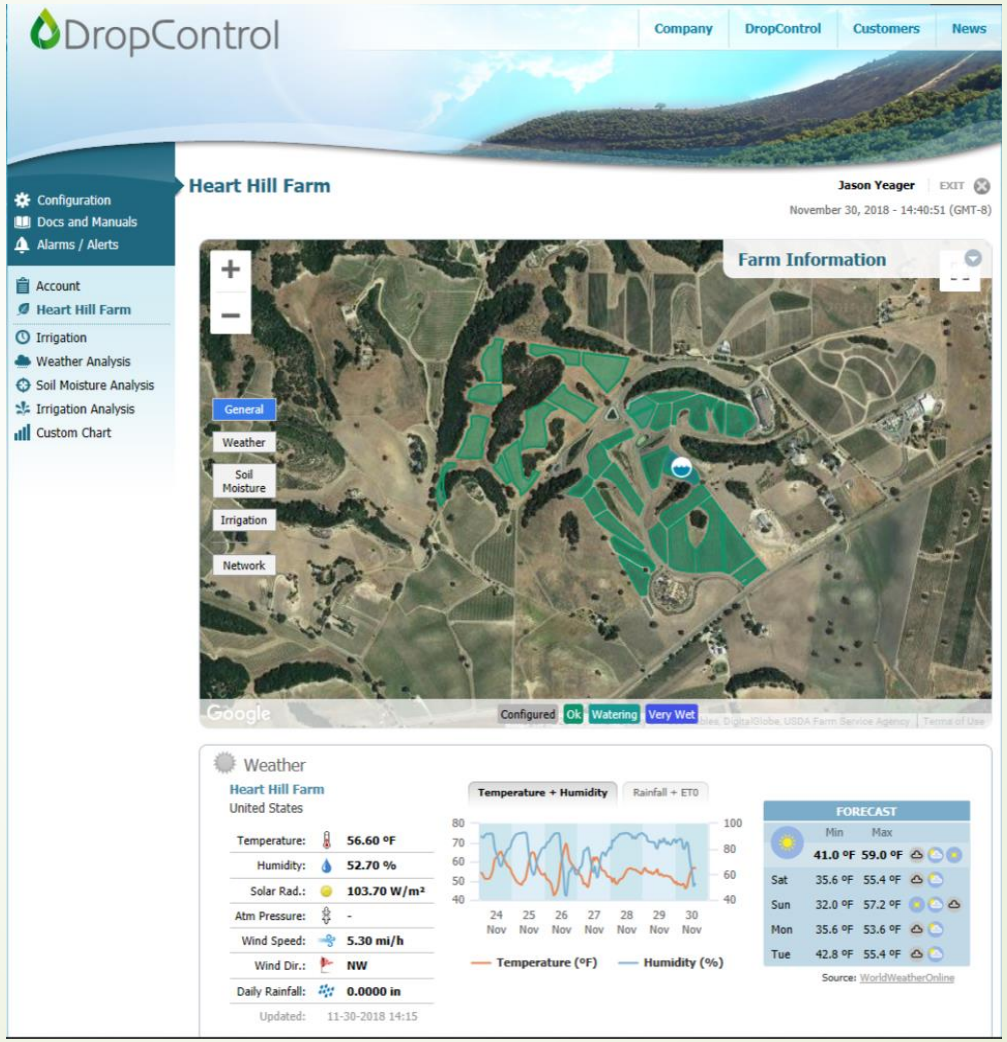
What is LEED certification?

- **LEED projects earn points by adhering to prerequisites and credits across nine measurements for building excellence from integrative process to indoor environmental quality.** Prerequisites are required elements, or green-building strategies that must be included in any LEED certified project. Credits are optional elements, or strategies that projects pursue to gain points toward LEED certification.
- **Credits are developed through several rounds of public comments and in collaboration with the USGBC board, broader membership and staff.** As market readiness increases and new technologies become widely available, credits adapt to improve the value and environmental integrity of building projects.
- **Based on the number of credits achieved, a project earns one of four LEED rating levels: LEED Certified, LEED Silver, LEED Gold or LEED Platinum.** The LEED rating systems work for all buildings at all phases of development and are meant to challenge project teams and inspire outside-the-box solutions.
- The **Green Business Certification Inc.**, or GBCI, provides third-party technicians the training and expertise necessary to review and verify building quality and integrity.
- LEED is driving international green building practices, with **more than 93,000 projects participating in LEED across 167 countries and territories**, and **a total of 19.3 billion square feet of space used worldwide**. USGBC estimates that nearly five million people experience a LEED building on a daily basis.

What is SIP certified?

- **Sustainability in Practice (SIP) Certified** helps farmers and winemakers demonstrate their dedication to preserving and protecting natural and human resources. SIP Certified is a rigorous sustainable vineyard and winery certification with strict, non-negotiable requirements, committed to standards based on science and expert input, independent third party verification, transparency, and absence of conflict of interest.
- Considers the whole farm – verifying the farmer's commitment to environmental stewardship, equitable treatment of employees, and business sustainability
- Contains practice and performance based requirements – every Requirement and Management Enhancement is demonstrable and auditable
- Prohibits the use of high risk pesticides – (toxic air contaminates, cholinesterase inhibitors, groundwater contaminants, California and federally restricted materials)

Ways we save water – Drop Control



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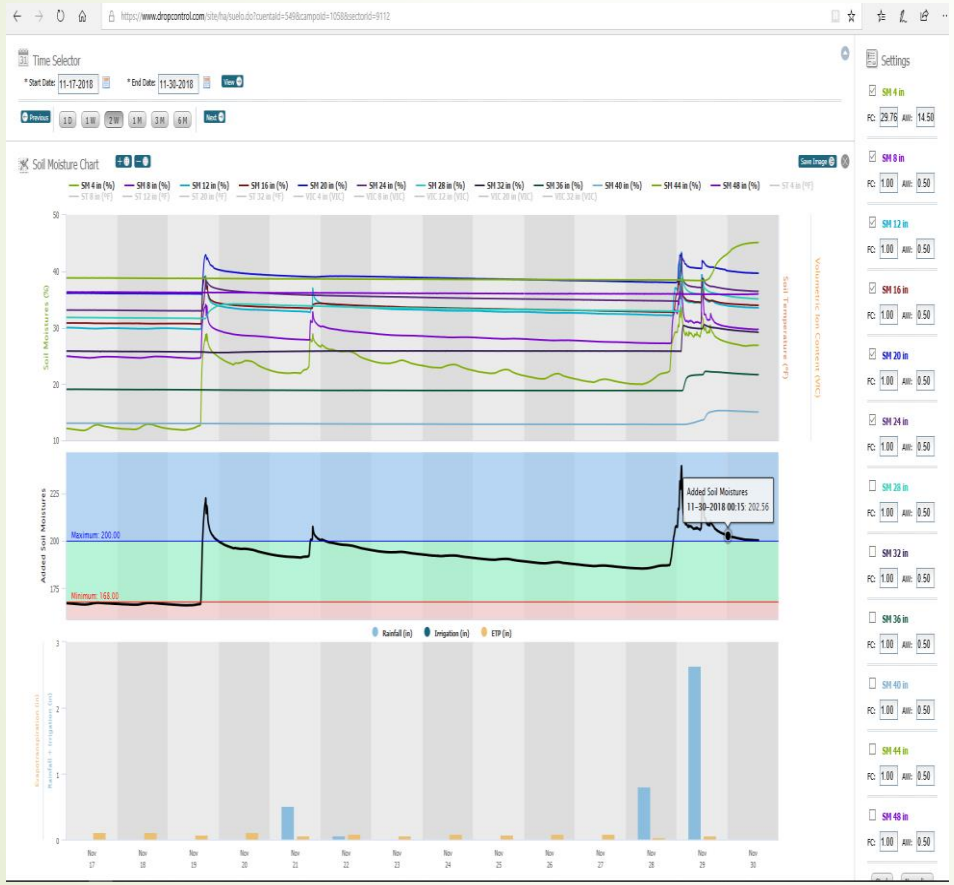

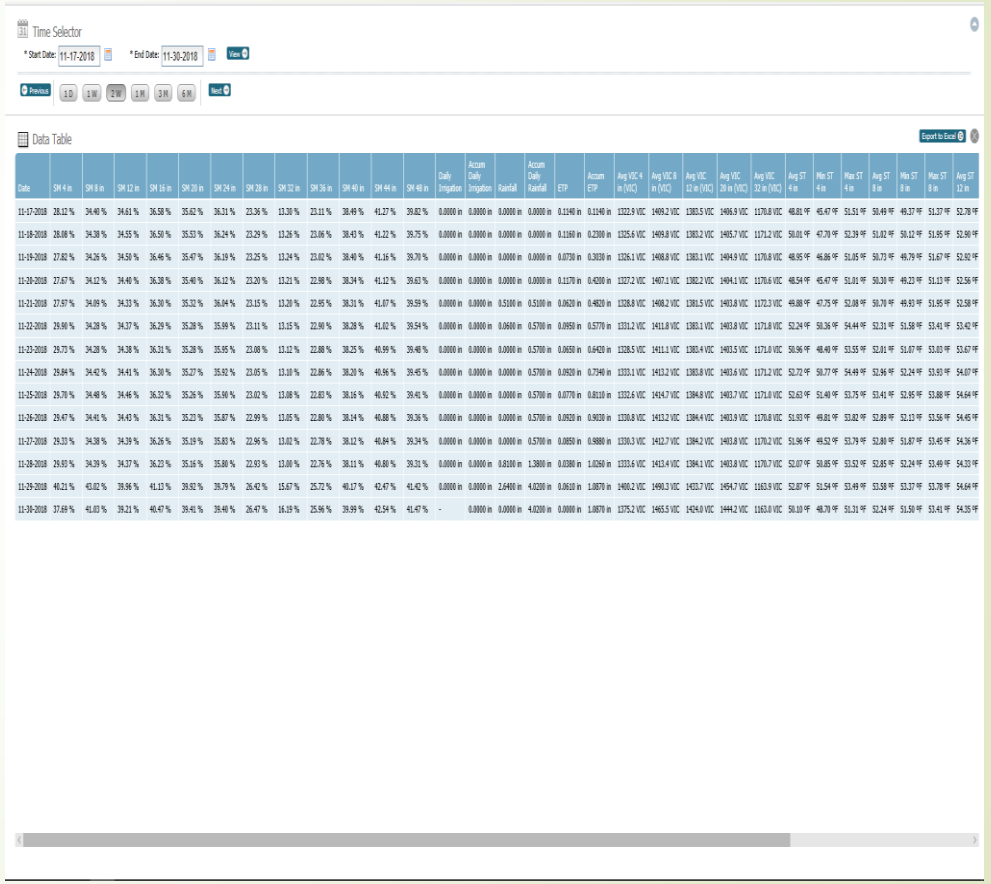

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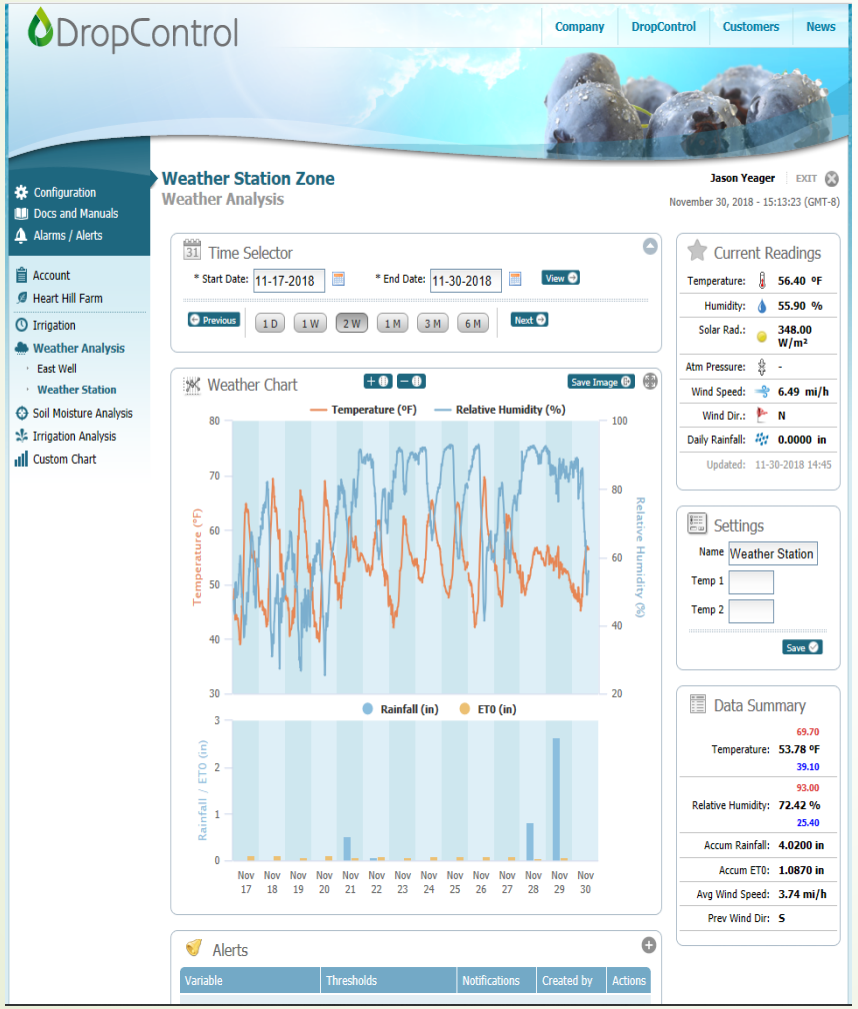

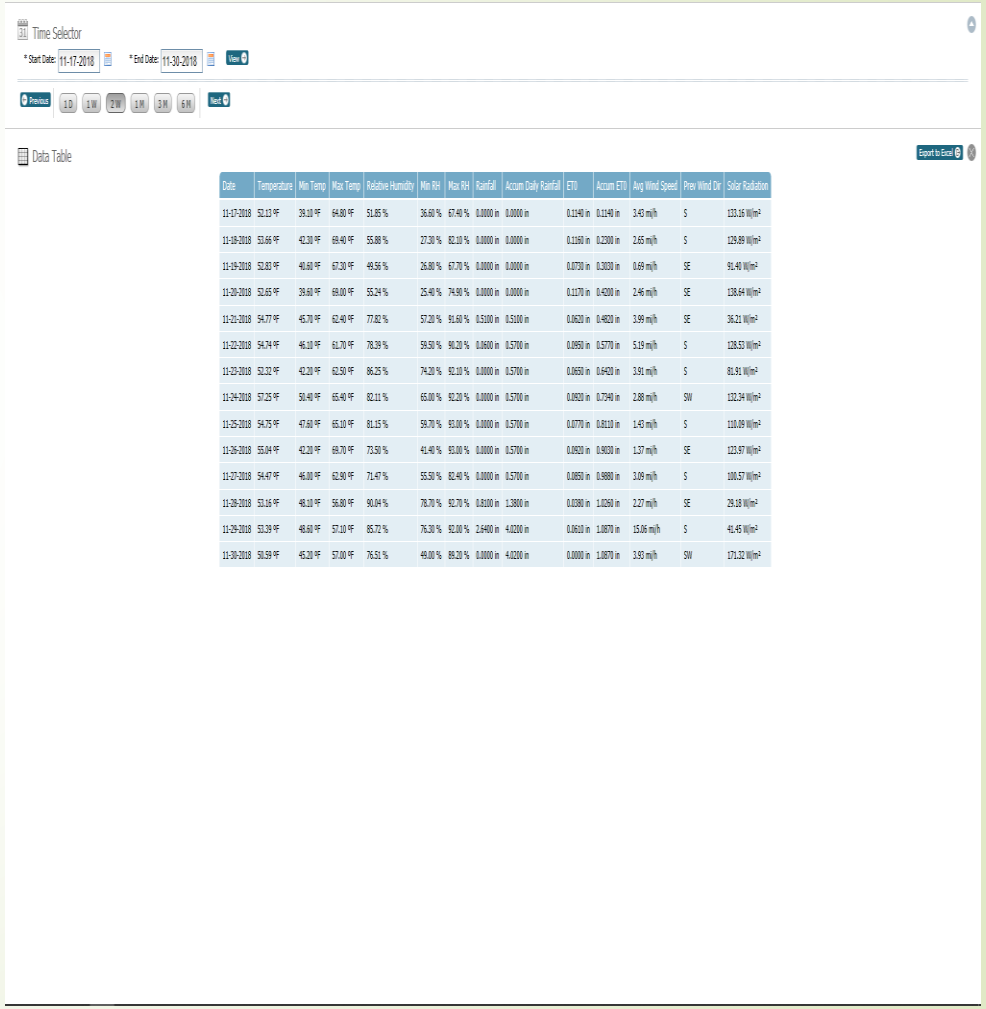

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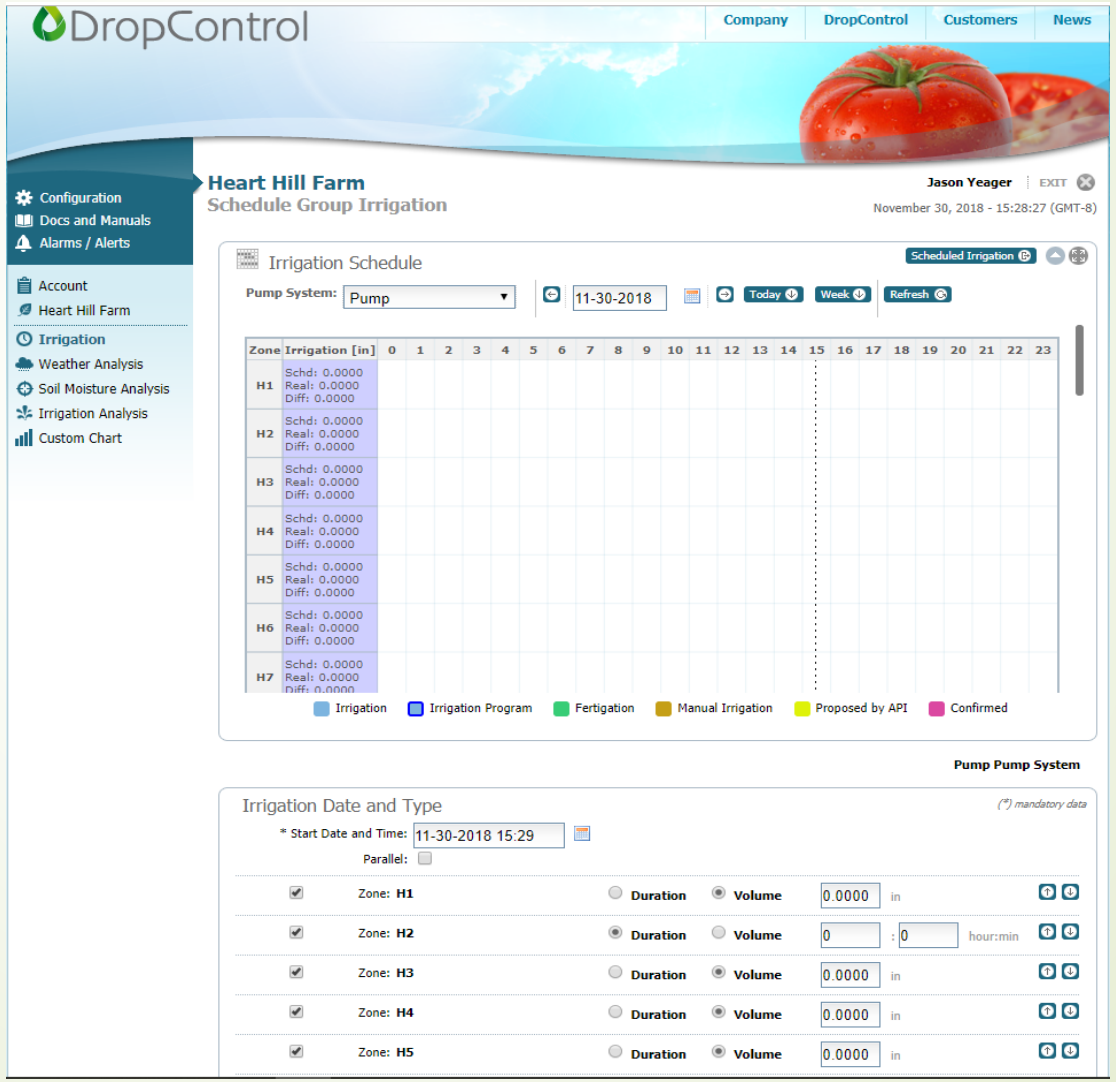
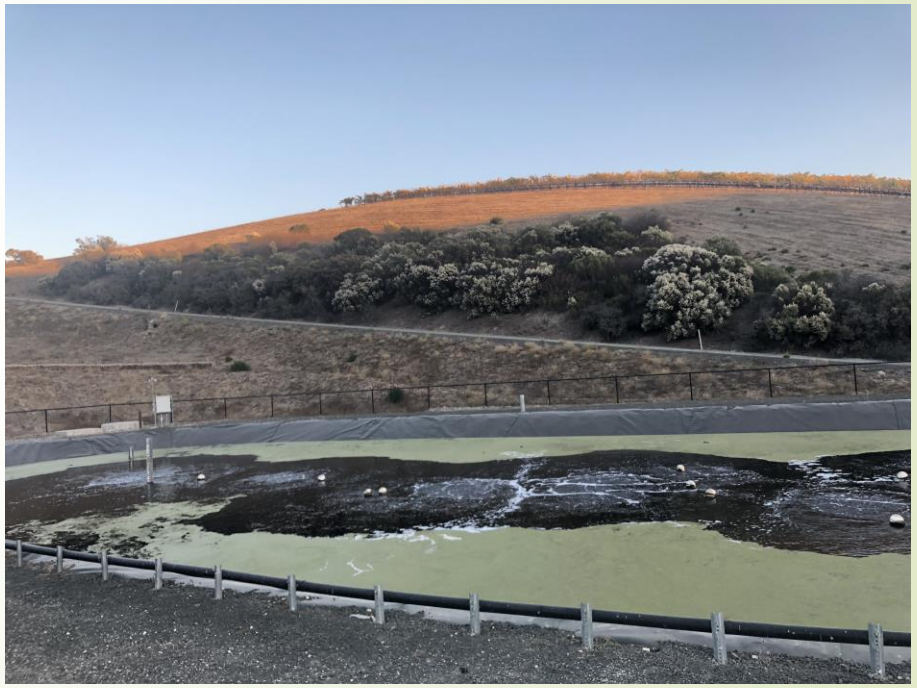


Monitoring stress with pressure chambers

How we save water - Reservoirs

- Recycling of all water used in the winery
- Collection of water during rain events – better quality water than that from wells
- All reservoirs are covered

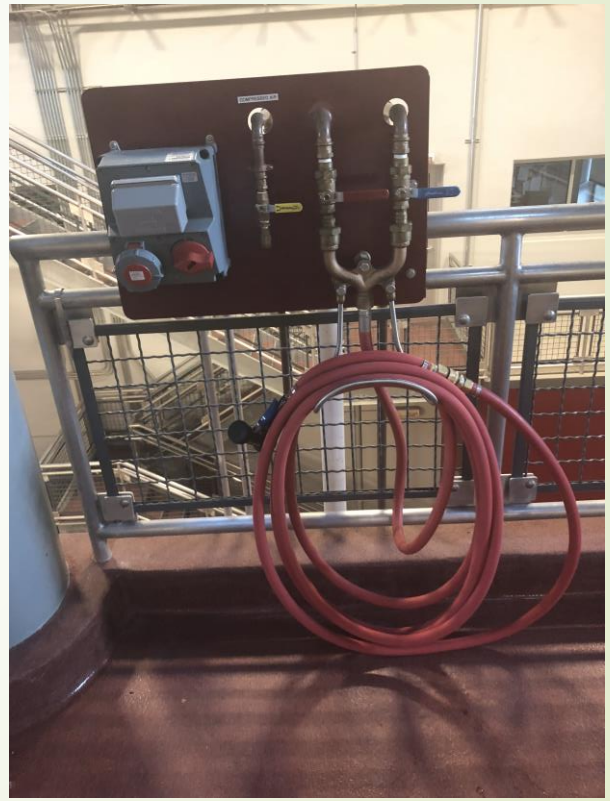
How we save water - Reservoirs



How we save water - Reservoirs

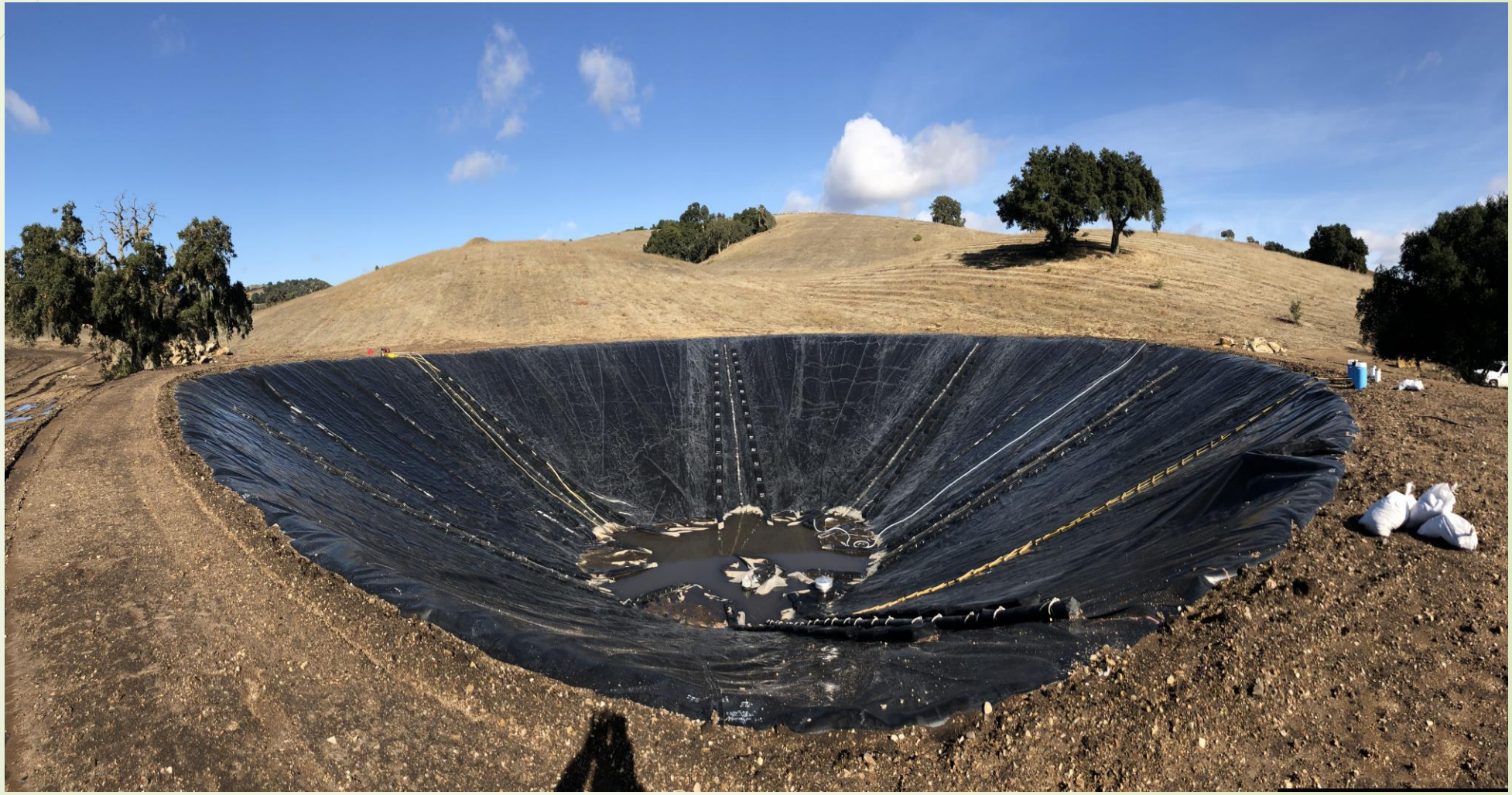
How we save water - Reservoirs

How we save water – 1) shut of on all hoses – 2)all water that hits floor is recycled



Pumps go to either water treatment pond or water collection pond

Collection reservoirs are covered

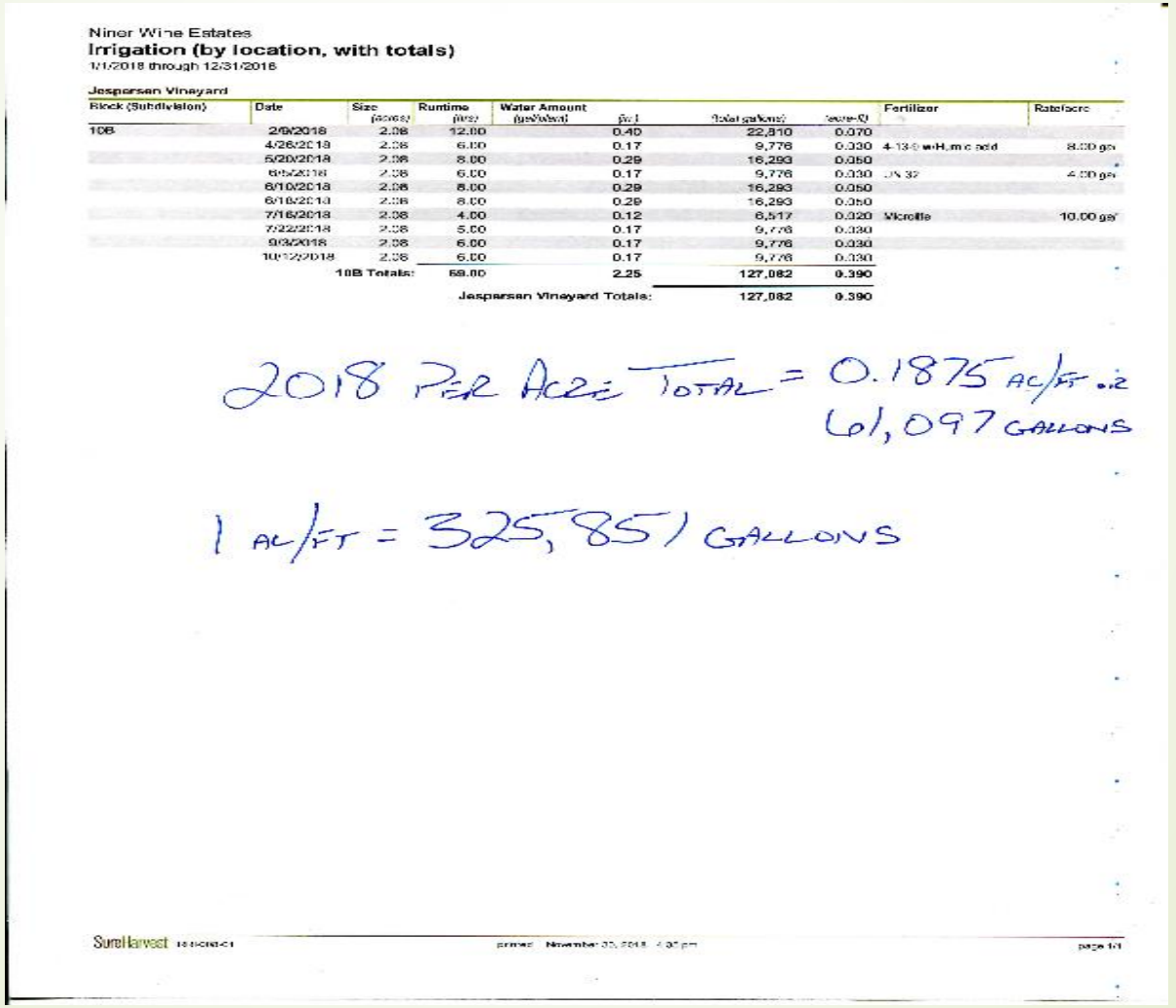


Other ways that save water – VFD (Variable Fluid Drive) and PSI comp emitters

Other ways that save water – Proper rootstock selection

Rootstock	Parentage	Phylloxera	Nematodes	Lime	Drought	Vigor	Quality	Soils	Grafting	Place	Other
101-14 Millardet et de Grasset	riparia-rupestris hybrid	High	Moderate	Low		Low	Yes			France	Shallow roots
110 R	berlandieri - rupestris cross	High	Low	Moderate	High	High		Infertile		Med. Climates	
1103 Paulsen	berlandieri - rupestris cross	High	Moderate	Moderate	High	Mod-High			Easy		
140 Ruggeri	berlandieri - rupestris hybrid	?		Mod-High	High	High		Dry		Med. Climates	
1613 Couderc	riperia-rupestris-candicans x labrusca-riperia-vinifera	Low-Mod	Mod-High					Fertile, sandy loam		California	
161-49 Couderc	riperia - berlandieri hybrid	High	NO								
1616 Couderc	riperia-rupestris-candicans x riperia	High	High			Low		Humid			
3309 Couderc	riperia - rupestris cross	High		Moderate	No			Humid	Easy	widespread	
333 EM	vinifera (CS) - berlandieri	Sufficient		Mod-High	Moderate						
41 B	vinifera (Chasselas) -berlandieri hybrid	Sufficient		High	Moderate					Cognac/Champagne	
420 A Millardet et de Grasset	berlandieri - riperia hybrid	High	Low-Mod			Low	Yes	Chalky			
5 BB Kober / Teleki	berlandieri - riperia hybrid	High		Moderate		High		Humid/clay		Europe, esp. Germany & Switzld	
5 C Teleki	berlandieri - riperia hybrid	?		Moderate		High				Germany	
99 Richter	berlandieri - rupestris hybrid	High	Moderate		Moderate	High				Warm climates	
AXR1	vinifera-rupestris	NO				High			Easy		
Dog Ridge	v. champini		High			High	NO	Infertile			
Fercal	berlandieri x Colombard w/ 333 EM	High		Mod-High	Moderate	Moderate		Lime	Easy		
Harmony	champini x. 1613C	Low	High			Mod-High					
Riperia Gloire de Montepellier	v. riperia	High				Low	Yes			Europe	
Rupestris St. George / du Lot monticola	v. rupestris	High			Low	High	NO				
Schwarzmann	riparia-rupestris hybrid	High	High			Moderate		Deep, moist		*not widely used*	
SO 4	berlandieri - riperia hybrid	High	Moderate			Moderate		Moist			Mg deficiency

Example of total water used for the 2018 vintage



Niner Wine Estates

Irrigation (by location, with totals)

1/1/2018 through 12/31/2018

Jespersen Vineyard

Block (Subdivision)	Date	Size (acres)	Runtime (hrs)	Water Amount (gal/blend)	(in.)	Total gallons	(acre-ft)	Fertilizer	Rate/acre
10B	2/9/2018	2.08	12.00		0.40	22,810	0.070		
	4/26/2018	2.08	6.00		0.17	9,776	0.030	4-13-6 w/H3PO4 acid	8.00 gal
	5/20/2018	2.08	8.00		0.29	16,293	0.050		
	6/5/2018	2.08	6.00		0.17	9,776	0.030	UN 32	4.00 gal
	6/10/2018	2.08	8.00		0.29	16,293	0.050		
	6/16/2018	2.08	8.00		0.29	16,293	0.050		
	7/16/2018	2.08	4.00		0.12	6,517	0.020	Vicrolla	10.00 gal
	7/22/2018	2.08	6.00		0.17	9,776	0.030		
	9/3/2018	2.08	6.00		0.17	9,776	0.030		
	10/12/2018	2.08	6.00		0.17	9,776	0.030		
	10B Totals:		68.00		2.25	127,082	0.390		
	Jespersen Vineyard Totals:					127,082	0.390		

2018 PER ACRE TOTAL = 0.1875 AC/FT .i2
61,097 GALLONS

1 AC/FT = 325,851 GALLONS

SurfaceHarvest

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Other ways that save water

Types of frost protection

- Water
  - Overhead impact sprinklers
    - Can protect down to 23 degrees F
    - Needs 56 gallons/minute per acre or 3360 gallons/acre per hour
  - Micro-sprinklers
    - Can protect down to 26 degrees F
    - Needs 16 gallons/minute per acre or 960 gallons/acre per hour
- Wind machines or helicopters
  - Can protect down to 28 degrees F (lower if inversion layer is strong)
- Vineyard heaters
  - Not recommended – not effective and incredibly polluting

Final thoughts…

- Create keyways in vineyards and open areas
- Ease restrictions on surface water collection
- Create incentives to use alternates to using water in operations
- Eliminate sunset clause in irrigated land ordinance in the Paso basin to encourage fallowing of un-necessary planting of irrigated crops in order to protect irrigated land rights
- Any future legislation that cuts water to agriculture should take into account those that are voluntarily practicing good water management with the latest technology

Questions??