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Santa Cruz Mountains Winegrape Growers and Wineries Research Needs Report

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EXECUTIVE SUMMARY

In fall 2024, we surveyed members of the Santa Cruz Mountains Winegrowers Association (SCMWA) and the Viticultural Association of Santa Cruz Mountains (VASCM) to learn about winegrape grower and winery research needs for the Santa Cruz Mountains American Viticultural Area (AVA). The survey aimed to understand current challenges and research needs of those in the wine industry, as well as interest in partnering with UC Santa Cruz researchers. We intend to use these survey results to inform development of an organic viticulture initiative at the University of California, Santa Cruz.



Key findings

Size, scale, and management practices: The majority of respondents own or operate a vineyard or winery. More than half of respondents described their operations as organic or sustainable, with a smaller amount identifying as regenerative or conventional. Most of the respondents indicated that their associated vineyards and wineries are relatively small-scale, with a few indicating that they were involved with larger operations.

Varietals: The Santa Cruz Mountains appellation is known for wines made from Pinot Noir and Chardonnay, and the survey confirms this. Additional varieties being grown in the region include Cabernet

Sauvignon, Cabernet Franc, Syrah, and 22 additional varieties. When asked about current challenges and research needs, respondents identified potential winegrape varieties that should be considered for the region, including Sauvignon Blanc, Chenin Blanc, Gamay, Grenache, and Aligoté, as well as the broader categories of Native Grapes and New Hybrids and 16 additional varieties that would be new to the area.

Challenges: Top three challenges identified included 1) soil health of the unique mountain soils, 2) disease management in cool, humid coastal climates with significant disease pressure, and 3) identifying new varieties best suited to the area, especially as climate changes.

Additional challenges reported include weed management, diseases, labor, vertebrate pest management, grape sales, and licensing and reporting to multiple regulatory agencies. The top ranked priority area for research was soil health, followed next (in decreasing order of importance) by disease control, nutrient management as it impacts diseases and wine quality, insect and mite management, climate adaptability, water and irrigation management, wine quality, and vineyard floor management. Powdery mildew is ranked as the most impactful disease, followed by Botrytis bunch rot, viruses, trunk diseases, young vine decline, and Pierce’s Disease. Mealy bugs, leafhoppers and mites are equally ranked impactful arthropod pests, followed by caterpillars.

Interest in engagement with UCSC: Survey respondents expressed strong interest in being involved in future research studies conducted by UC Santa Cruz. They reported that educational workshops are/would be most helpful, followed by on-campus or on-farm research. Summer interns were also identified as valuable, as were publications.

INTRODUCTION

The UC Santa Cruz Center for Agroecology is exploring the development of an organic vineyard and,

potentially, a campus-linked winery. These sites would allow for hands-on educational experiences and applied research to support development of efficient and sustainable organic viticulture techniques in coastal vineyards.

UCSC is committed to working with local communities to advance coastal climate resilience through teaching and research that engages directly with adaptive management strategies in the region. The Santa Cruz Mountains have produced exceptional wines for many years without significant local research support or focused academic programming. We now have an opportunity to build on 50 years of organic agriculture research and practice at UCSC to create the next generation of environmental and plant scientists and engineers who will serve local growers and vintners.

This report shares the results of a recent online survey of Santa Cruz Mountains' viticulture and winemaking organizations regarding the make-up of their current production system, current challenges, and their research needs. We are pleased to share the results of the survey.



SURVEY METHODS

The survey on grower and winery research needs was conducted using the online program Survey Monkey and included 17 questions (two of the questions asked for demographic and contact information). We emailed a link to the online survey to the Santa Cruz Mountains Winegrowers Association (SCMWA), which has approximately 75 active (200 total) members, on October 29, 2024. The survey link was also sent to members of the Viticulture Association of the Santa Cruz Mountains (VASCN) on November 21, 2024. There is considerable overlap in membership between the two organizations.

Survey response data are presented in three ways: Either as the percent of responses by a predetermined response category, including "other" and a fill-in-the-blank; or written text to open ended

questions; or as the average weighted ranking, which shows the most preferred answer choice overall. The average ranking is calculated as follows:

$$w = \text{weight of ranked position}$$

$$x = \text{response count for answer choice}$$

$$\frac{1w1 + x2w2 + x3w3 \dots xnwn}{\text{Total response count}}$$

Weights are applied in reverse, meaning the respondent's most preferred choice (which they rank as #1) has the largest weight, and their least preferred choice (which they rank in the last position) has a weight of 1. This ensures that when the data is presented on a chart, it is clear which answer choice is most preferred. For example, if a ranking question has 5 answer choices, weights are assigned as follows:

- The #1 choice has a weight of 5
- The #2 choice has a weight of 4
- The #3 choice has a weight of 3
- The #4 choice has a weight of 2
- The #5 choice has a weight of 1

RESULTS

By December 4, 2024, there were 35 respondents for a 46.6% response rate (35/75) and a 94% completion rate. Almost 30% of respondents were owner/operators, 25% had a winery operation, and 15% owned a vineyard but were not directly farming it (Figure 1).

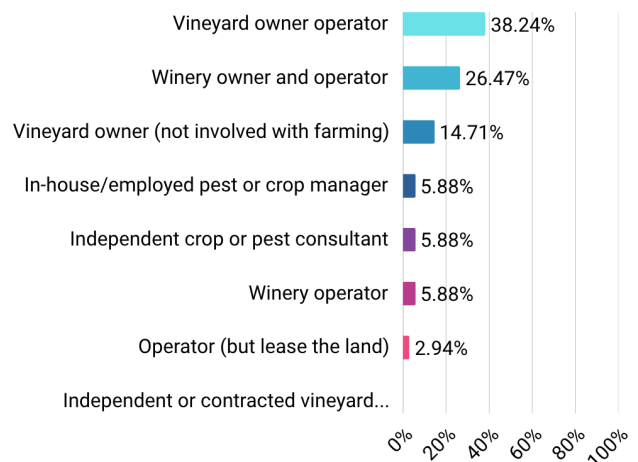


Figure 1. The primary role of survey respondents in their viticultural operation, shown as a percentage of responses (n=34).

Vineyard Management Practices: Most respondents described their operations as organic (58%) and/or sustainable (56%), 20% responded they are regenerative, and 15% are conventional (Figure 2). Other descriptions offered of the farming operations included: agroecological and dry-farmed; mostly

organic but will use conventional when necessary; cover crops, dry farmed, pomace inclusion, no till; non-certified organic; certified sustainable, partial organic, low input.

Size/Scale of Operation: Most of the vineyards in the area are relatively small: 35% are 1-5 acres, 21% are 5-10 acres, and 18% are 10-30 acres, with a few larger operations of 50+ acres (Figure 3).

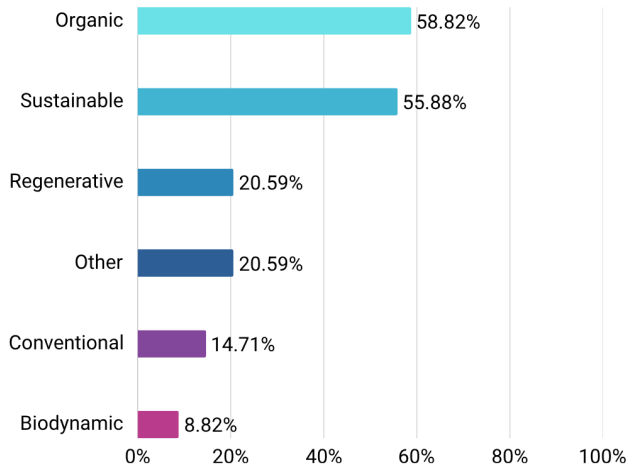


Figure 2. Category that best describes current vineyard management practices; shown as a percentage of responses (n=34).

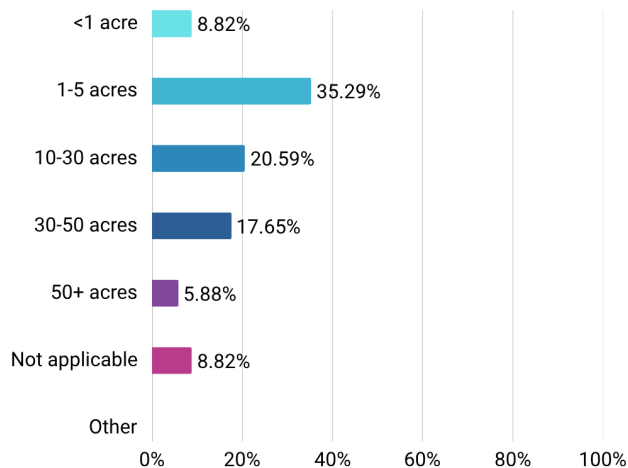


Figure 3. Size of vineyards farmed by respondents, as a percentage of responses (n=34).

Wineries are also small-scale, with 45% producing fewer than 2000 cases a year, and 23% producing under 5000 cases a year, but a few larger operations produce 30,000 to 60,000 cases a year (Figure 4).

Varieties Grown: The Santa Cruz Mountains appellation is known for growing Pinot Noir and Chardonnay, and the survey confirms this with 70% reporting growing Pinot Noir, and 61% growing Chardonnay (Figure 5).

Additional varieties being grown here include Cabernet Sauvignon (42%), Cabernet Franc (36%), and Syrah

(24%). In addition to the main varieties shown in Figure 5, 22 unique “Other” varieties being grown were noted and included the following, with the number of unique respondents mentioning the same variety noted in parentheses: Merlot (7), Sauvignon Blanc (6), Zinfandel (5), Petit Verdot (5), Chenin Blanc (3), Nebbiolo (3), Riesling (2), Viognier (2), Sangiovese (2), Petite Sirah (2), Aligoté, Barbera, Blaufränkisch, Dolcetto, Gamay, Gewürztraminer, Grenache, Mission, Pedro Ximénez, Semillon, Shiraz, and Zweigelt.

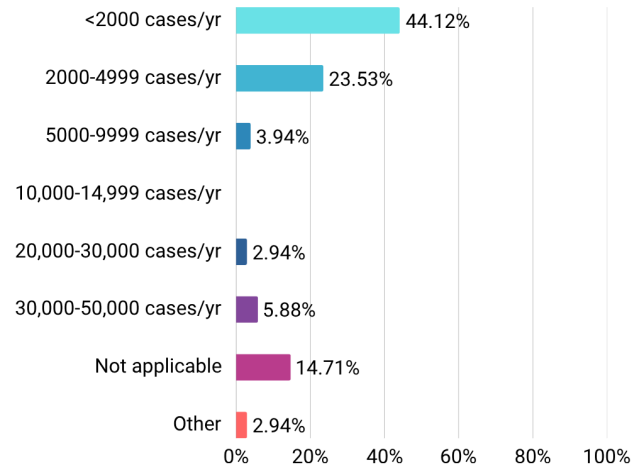


Figure 4. Scale of respondent’s winery operations; percentage of responses (n=34).

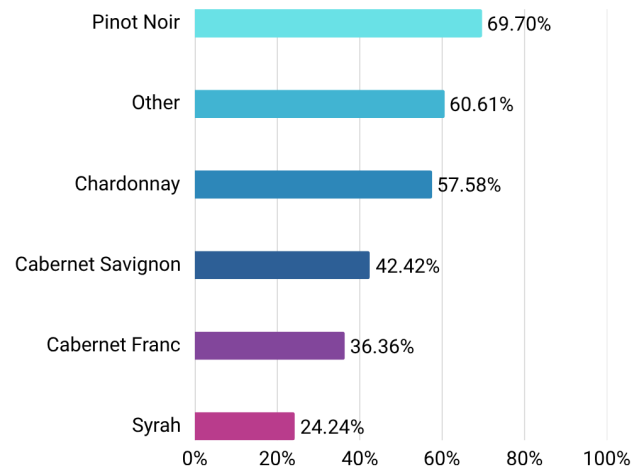


Figure 5. Varieties grown in the area; percentage of responses (n=33).

Future Varieties: In terms of new varieties to consider growing in the region, Sauvignon Blanc and Chenin Blanc were identified most frequently, followed by the broader categories of Native Grapes and New Hybrids, followed by Gamay, Grenache, and Aligoté (Figure 6). In the “Other” category, 16 write-in new-for-the-region varietals that respondents mentioned included: Godello (2), Tempranillo (2), Italian varieties/natives (2), Albariño, Friulano, Gruener, Mencia, Riesling, Sylvaner, Syrah, Veltliner, Xinomavro, Yakult, and heat-resistant white varieties (Figure 6).

Challenges: Fifty-three percent (53%) of respondents said weed management was a major challenge for them, 50% said disease management, then labor at 34%, vertebrate pest management at 31%, followed by grape sales 28%, licensing and reporting to multiple regulatory agencies, insect and mite management (16%), and water management (Figure 7).

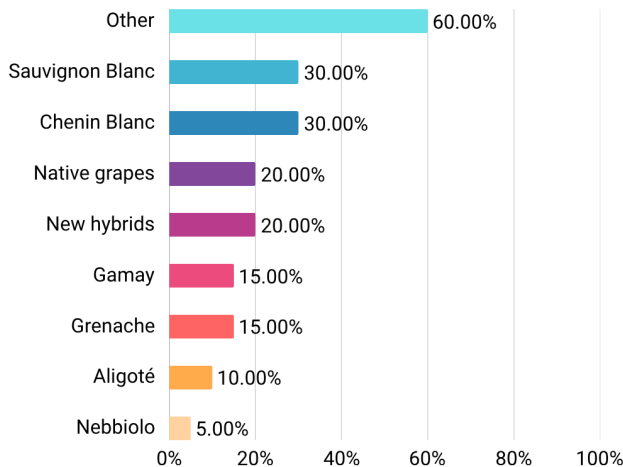


Figure 6. Other, newer varieties that respondents (percent of responses) would be interested in growing (n=20).

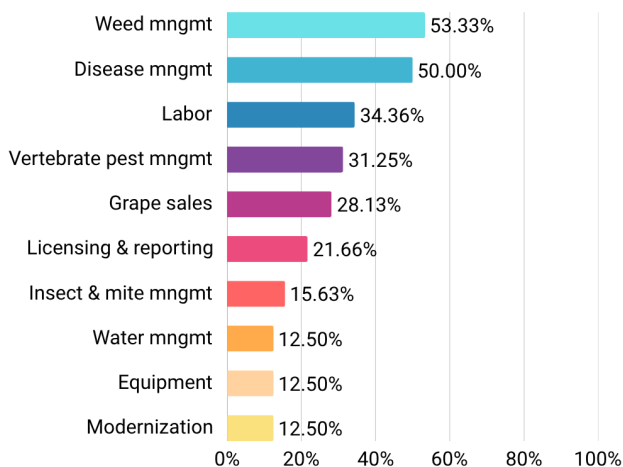


Figure 7. The biggest challenges respondents are currently facing; percent of responses (n=32).

Research Priorities: The top ranked priority area for research reported by respondents was soil health, followed next (in decreasing order of importance) by disease control, nutrient management as it impacts diseases and wine quality, insect and mite management, climate adaptability (and farming practices that increase resilience), water and irrigation management, wine quality (and vineyard practices and how they impact it), and vineyard floor management (and understanding the role of the soil microbiome, cover crops, organic amendments, weed control, etc.) (Figure 8). The top three ranked issues are in fact interrelated, as soil health is thought to impact vine health and vine nutrient management can impact

disease susceptibility and wine quality. Insect and mite management was ranked just below disease management, but still a high priority (Figure 8).

Climate adaptability, water and irrigation management, and vineyard floor management were all ranked similarly, and also interact with each other and impact wine quality. Grape varietal and clone evaluation for the region were ranked in the middle in terms of importance. Marketing, ecotourism, and regional markets were mentioned as intermediately important. Finally, engineering solutions and integrating animals into vineyards were ranked towards the bottom but still important for some respondents.

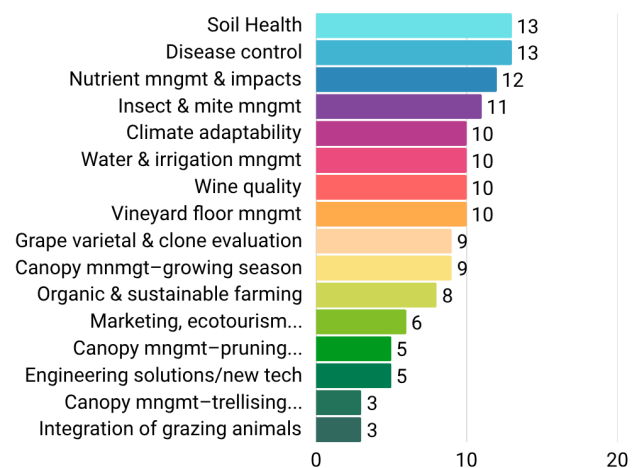


Figure 8. The areas of research that the University of California, Santa Cruz should focus on; average weighed ranking (n=34).

When survey respondents were asked an open-ended question (question # 9) for what specific areas of research UC Santa Cruz should focus on, the following 20 topics were suggested, which we have grouped and ordered by the number of related topics that fall within these groupings.

- **Wine flavor/quality:** Relationship of soil health and wine quality, physiology of flavor development in vines. Overall management to produce the highest quality wine. How bacteria and fungi in soil affects grape/wine flavor/taste.
- **Disease management:** Organically growing in a high disease pressure area. Novel methods for powdery mildew control using UV-C light at night. Integration of disease management and fertilization.
- **Climate change:** Adapting canopy and vineyard management to climate change. Climate change & SC Mountain AVA.
- **Marketing/sales:** Focus on the importance of organic practices and marketing to the consumer. Improve wine sales.

- **Varietal testing:** Test plots trying out more varieties. The region needs more grape variety options beyond the dominance of Pinot Noir, Chardonnay, and Cabernet Sauvignon.
- **Water/irrigation:** Water savings with dry farming. Water capture and recycling systems for wineries.
- **Weed management:** Weed management under vine, we are terraced, and it is very difficult to manage weeds with anything other than a weed whacker. Management of invasive weeds.
- **Livestock:** Impact of sheep/grazing/livestock in the vineyard to increase soil health & effect on wine quality.
- **Canopy management:** Effects of row orientation/trellising on rate of grape maturation.
- **Arthropod management:** Wasp management.
- **Other:** Proving that conventional farming is more sustainable than organic. Possibilities to create a communal machine sharing program.

Powdery mildew was ranked the most impactful disease, followed by Botrytis bunch rot, and then viruses, trunk diseases, young vine decline, and Pierce's Disease (Figure 9). While the cool, humid, coastal climate provides conditions that favor both diseases, the winter rains and long season of high relative humidity and coastal fog coming from the ocean in this region, combined with the varieties that are grown do suggest that powdery mildew would rank ahead of Botrytis bunch rot (Figure 9).

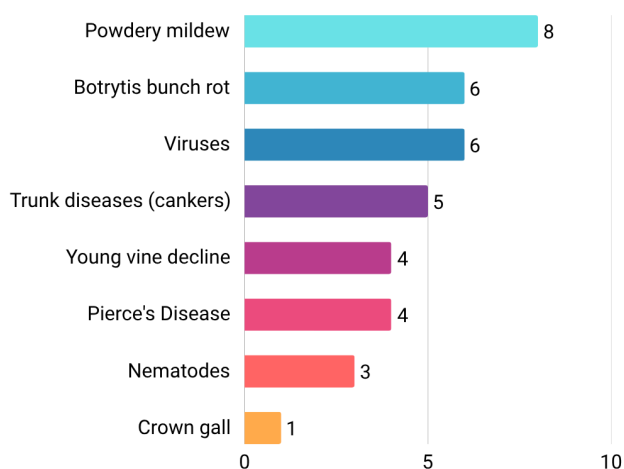


Figure 9. Ranking of diseases that are most impactful in the region; average weighed ranking (n=26).

When asked to rank arthropod pests, respondents reported mealy bugs, leafhoppers, and mites as equally impactful, followed by caterpillars (Figure 10).

When asked specifically about their potential interest in being involved in the future in research studies

conducted by UC Santa Cruz, 65% said they were interested, 32% said maybe, and a very small number said they were not interested (Figure 11). When asked what particular areas of work by UC Santa Cruz are or will be most helpful, 59% said educational workshops, 56% said either on-campus or on-farm research, 34% said hiring summer interns, and 22% said publications.

Other programs and activities that would be most helpful included 1. Extend experience with dry farming at UCSC to grapes. 2. Community engagement as a guest speaker. 3. Cooperative projects with Engineering Program and Agriculture. Agriculture needs leading engineers to develop efficient equipment to enhance organic and sustainable viticulture.

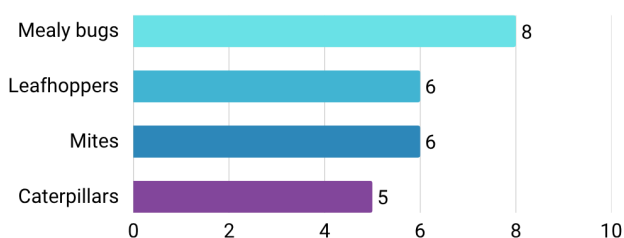


Figure 10. Ranking of the importance of arthropod pests (insects, mites) in the region (n=13).

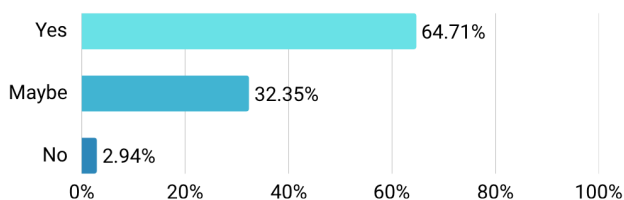


Figure 11. Percent of responses about most useful UCSC programs (currently/future) (n=32).

When survey respondents were asked an open-ended question about **other issues or concerns that were not yet addressed** regarding local viticulture (n=30) the following comments were received:

1. Invasive species, both plant and insect.
2. Maximizing wine quality through the timing of harvests.
3. The price of labor, which affects the cost of fruit, which affects the cost of the wine, which affects the consumer AND the winery. People only have so much money to spend, and wine is already viewed as a luxury and not a necessity, plus the wine industry needs new and younger customers. Make wine attractive and affordable, not snobby/pretentious and unaffordable. This isn't Napa, and we don't want to become Napa.
4. You covered plenty, thanks...I love the idea of collaborating with the University of California.

- I'm really happy you are considering this. It would be a great resource to local wineries and the growing conditions of the Santa Cruz Mountains are rather unique and data from Davis and Fresno really doesn't apply that well.

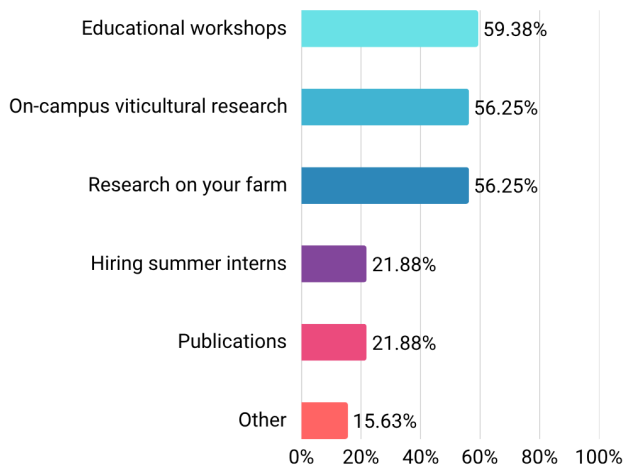


Figure 12. Percent of responses about most useful UCSC programs (currently/future) (n=32).

CONCLUSIONS

The survey identified strong interest from respondents to have UC Santa Cruz engage in viticulture research and extension. Based on the long history of agroecology and organic farming on the campus through the Center for Agroecology, and because a majority of survey respondents reported farming organically, it seems appropriate for a focus on organic viticulture and how agroecology as a discipline of practice could inform it.

The Santa Cruz Mountains AVA includes wine grapes grown on 2049 acres in three counties: Santa Cruz, Santa Clara, and San Mateo where the combined contributions to the regional economy in 2023 was reported by the County Crop Reports as \$15.6 million. Santa Cruz County alone also calculated the locally sourced, value-added food processing of the wine grape crop; that is the wine produced as a direct value, and then added indirect value (tastings, weddings, events etc.) providing significant economic contributions of \$116 million in 2023.

Survey results and connections with UC Santa Cruz expertise: UC Santa Cruz faculty are well-positioned to become more involved in organic viticulture research in the areas highlighted in the survey, such as soil health, increasing on-farm biodiversity through regionally-appropriate cover crop studies, weed management, pest management, water use efficiency, and nutritional benefits.

Looking to the future related to the current challenges and research needs identified by respondents, potential varieties that should be considered for the region include Sauvignon Blanc and Chenin Blanc, Gamay, Grenache, and Aligoté. Additionally, the broader categories of Native Grapes as well as the New Hybrids coming out of the UC Davis breeding program could add value to the region and the wider California industry. With a vineyard at the certified-organic UC Santa Cruz Farm, we could trial new-to-the-region varieties to evaluate the potential to contribute to quality wines for the area and conduct studies on the best cultural practices for the region.

The smaller-scale vineyards in the AVA are often closely associated with native plant communities and species, such as oaks, redwoods, madrones or manzanita. The UCSC Natural Reserve and campus faculty can contribute to a greater understanding of how native plant communities interact with vineyards in the region. For example, the microbial communities associated with those plants may influence soils as well as above-ground plant-associated microbiomes. Questions that could be studied include whether or not native plants surrounding vineyards might impact mycoparasites or beneficial arthropod species. For example, *Ampelomyces quisqualis* is a mycoparasite that feeds on various powdery mildews; might it be encouraged to move from oaks to grapevines.

Collaborations with other campuses: UC Davis has many world-renowned faculty conducting viticulture and enology research and could become key collaborators with UC Santa Cruz faculty and programs. There are wine and viticulture-related classes currently offered at Cabrillo College, which could become more tightly linked with a UC Santa Cruz program, potentially enabling transfers to UC and providing practical course offerings for UCSC students as intercampus exchanges. Longstanding viticultural programming by Monterey County Cooperative Extension could be engaged to expand work further up the coast and conduct collaborative organic viticulture research. Finally, there could be collaborations with Cal Poly State University San Luis Obispo and their 30-acre research and demonstration vineyard and their recently-completed research winery.

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Vineyard Team's Sustainability in Practice (SIP) [Sustainable Vineyards. Wineries and Wines | SIP Certified](#)

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