Vit Tips
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Vineyard Weed Control

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How important is vegetation management in vineyard systems? Most mature vines can withstand some competition, but even the most robust vineyards can suffer from the effects of uncontrolled weed growth. Weeds compete for water, nutrients, and sunlight; newly planted vineyards are especially susceptible to competition. In the first three years, weed competition can reduce vine growth by 50% (Bettiga 2013). Weeds can also reduce the effectiveness of irrigation by disrupting the distribution and uniformity of water application. Another reason to keep weeds under control is because they can attract and harbor insect pests. For example, leaf hoppers cannot survive on dormant vines but can overwinter on weedy plants. If the weeds hosting the pest are not controlled before budbreak, it will be easy for the pest to move over to the new tissue, causing damage in the early part of the growing season. Controlling weeds helps remove habitat for rodent pests as well. Weeds can also be a nuisance that gets in the way of vineyard operations. Tall weeds such as horseweed and lamb's quarters and vining weeds such as morning glory and field bindweed are especially problematic in this way, as are weeds species with sharp or sticky seeds. Further, weeds can affect the microclimate of a vineyard, such as increasing frost risk in the spring or increasing the humidity of a vineyard which creates ideal conditions for many fungal diseases.

Although weeds can cause many issues in a vineyard, the good news is that there are a wide variety of effective control options available. Multiple factors should be considered before choosing the methods that will work best for your operation. Before beginning any weed control, identify which weeds are present in your vineyard as different weed species require different control methods. This is true whether you are using chemical or mechanical control. For example, there is a saying that "nothing is resistant to steel," which implies that even herbicide-resistant weeds can be controlled by tillage. While that is true for many species, some plants like bermudagrass propagate through underground rhizomes, and discing them will expand their population. Some common vineyard weeds are listed in Table 1, and there are resources to help you identify them at the end of this article.

Weed Control Options

Mechanical control options include tilling, mowing, and hand hoeing. Mowing may kill some small plants, but many plant species will eventually regrow. A benefit of mowing is that it does not disturb the soil, allowing for better water infiltration and reduced wind and water erosion. Discing effectively kills many weeds by breaking down the plants and incorporating them into the soil. However, discing can create compaction problems, and because it breaks down soil structure, it decreases organic matter, reduces water penetration, and increases soil erosion. In vineyards, only the row middles are disced. A French Plow can be used to cultivate soil in vine rows. As mentioned earlier, tilling will kill most weeds; however, be cautious tilling vineyards with rhizomatous weeds. Tilling weeds when the soil is moist will likely result in the pieces sprouting roots and their population increasing in the vineyard. Nutsedge and field bindweed populations can be reduced through plowing, but only if they are buried deep enough (12 inches or 16-18 inches, respectively). Shallower cultivation in dry soil can kill nutsedge by drying out

the tubers, but they can resprout in moist soil. Shallow cultivation won't kill field bindweed because it has very deep roots, and the root fragments can regrow even in dry soil conditions. However, you could prevent them from setting seed if tilled early enough.

For chemical control, herbicides can be divided into pre-emergents or post emergents. Pre-emergence herbicides only prevent weed seeds from germinating, and post-emergence herbicides only control actively growing weeds. To be effective, most pre-emergent herbicides need to be applied to a clean field (berm) and incorporated within two to three weeks after application. Pre-emergence herbicides are typically applied from late fall to early spring since they require rainfall for incorporation.

Post-emergent herbicides are typically used in combination with pre-emergent herbicides and used during the growing season. Post-emergent herbicides are foliar applied and are either contact or systemic. Contact herbicides work relatively quickly but will only kill what they touch, so coverage is important. Systemic herbicides move within the plant and work best when the plant is actively growing. Since the herbicide must move through the plant to kill it, a systemic herbicide will take longer to achieve control than a contact. Systemic herbicides can be used to control perennials and other weeds that can resprout from established root systems. Foliar herbicides often require adjuvants such as crop oil concentrates, methylated seed oils, or non-ionic surfactants to enhance their efficacy and performance. Depending on which weed species are present in your vineyard, you could apply grass, broadleaf, or broad-spectrum herbicides, which can kill both types. Carefully read the herbicide label to verify its effectiveness against specific weed species, particularly because certain weeds have developed resistance to herbicides. Calibrating spray equipment is needed to ensure safe application of herbicides and minimize drift.

Organic Weed Control

Most currently registered organic herbicides are post-emergent and contact-based. They tend to require higher volumes and cost more money than their conventional counterparts. Although they are not selective, they do tend to be more effective on broadleaf weeds than grasses and work best on small plants.

Other forms of organic weed control include tilling, mowing, hand labor, mulching, and cover crops. Hand labor is expensive and time-consuming but may be the most effective option in organic vineyards. It is also the most effective at controlling weed escapes. Mulch can be used to block light and prevent seed germination. It also increases organic matter and helps retain moisture. However, it can provide cover for rodents. Mulch can come in organic forms, such as wood chips or even mowed weeds or cover crops, but that material will decompose and must be replaced yearly. Synthetic mulches can also be used, which will hold up for longer periods. Similar to organic mulches, cover crops can be planted to compete with weeds. Other benefits of cover crops include reduced erosion and improved soil health. However, they should be mowed before budbreak to reduce frost risk and avoid competing with the vines for resources during the growing season.

Additional concerns

As mentioned earlier, controlling weeds is most critical in young vineyards because their small size makes them less competitive for light, and a young vine's limited root system also makes them less

competitive for water and nutrients. However, exercise caution when applying herbicides because contact with green wood or foliage can seriously injure the young plants. Even mature vines can suffer from crop injury when an herbicide spray is poorly timed. For example, some products like oxyfluorfen should not be applied after February 15th, and some are risky after budbreak, especially in table grapes where berry appearance is so important. Hooded sprayers can be used during the growing season to minimize herbicide drift. Also, be careful to avoid application when pruning or girdling has recently been done, as the chemicals can enter the open wounds.

Timing is critical no matter what type of weed control method is used. The older and larger a weed is, the harder it will be to kill. You'll have much greater success if you can attack the weeds when they are young. For herbicides, larger plants mean a larger surface area that must be covered, and more of the plant to dilute the herbicide in. For mechanical control, larger plants take more effort, as more of the plant is below the soil surface, allowing it to regrow after being injured. It is also important to kill the weed before it sets seed, otherwise they will add to the existing weed seed bank.

Another important consideration is herbicide resistance. The number of weeds resistant to particular herbicides is ever-increasing, as are the weeds that have developed multiple resistances. It is very important to check the label before applying any herbicide and rotate your products to use multiple modes of action throughout the growing season.

Finally, properly calibrating your sprayer is incredibly important. Make sure your nozzles are the correct size and shape for your applications and do regular maintenance to replace worn-out or plugged nozzles. This can make a huge difference in the effectiveness of your herbicide application program.

New Trials

UCCE Weeds Advisor Jorge Angeles and I have recently begun working on several new herbicide trials at the Kearney REC in Parlier and at the West Side REC in Five Points. These trials are in young vineyards and examine both conventional and organic herbicide options. The results were promising, and we plan to continue these trials in 2025. Stay tuned for more information.

References and resources

Bettiga, L. J. (Ed.). (2013). *Grape pest management* (Vol. 3343). UCANR Publications.

Grape Pest Management https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3343

Raisin Production Manual https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3393

Weeds of California and Other Western States https://anrcatalog.ucanr.edu/Details.aspx?itemNo=3488

UC IPM Weed Photo Gallery https://ipm.ucanr.edu/PMG/weeds_intro.html

Grape pest management guidelines: Integrated Weed Management
https://ipm.ucanr.edu/agriculture/grape/integrated-weed-management/#gsc.tab=0

Image 1. An established table grape vineyard with palmer amaranth and morning glory weeds.

Image 2. A newly planted table grape vineyard and site of an herbicide trial

Table 1. Some common weeds found in San Joaquin Valley Vineyards

Grasses	**Broadleaves**
Summer Annuals	*Summer Annuals*

Barnyard grass Large crabgrass Yellow foxtail *Winter Annuals* Annual bluegrass *Perennials* Bermudagrass Johnsongrass	Burning nettle (winter or summer annual) Common lamb's quarters Prostrate pigweed Spotted spurge Black nightshade Hairy fleabane Horseweed Morning glories Puncturevine Tall annual willowherb *Winter Annuals* Common chickweed Common groundsel Little mallow (cheese weed) Prickly lettuce (winter annual or biennial) Redstem filaree Shepherd's-purse Swinecress Henbit *Perennials* Yellow nutsedge Field bindweed

Navigating San Joaquin Valley's Burn Ban: A Grower's Guide to Understanding the Agricultural Burning Disease Exemption for Vineyards and Orchards

By Dr. Justin Tanner, Viticulture Advisor, and Dr. Brent Holtz, Orchard Systems Farm Advisor, University of California Cooperative Extension – San Joaquin County

With open burning now banned except in dire emergencies, San Joaquin Valley vineyard and orchard growers face a dual challenge: protecting crops from disease while complying with the nation's strictest air quality mandates. At the January 17, 2025, meeting "Orchard & Vineyard Redevelopment Considerations – Avoiding Costly Mistakes," hosted by the San Joaquin Resource Conservation District experts from the San Joaquin Valley Air Pollution Control District (SJV APCD) and the San Joaquin County Agricultural Commissioner's Office outlined stringent new protocols for growers navigating this high-stakes landscape. This article synthesizes critical updates from that meeting into a step-by-step guide, helping growers:

- Secure emergency burn permits in cases of true crises.
- Avoid penalties by aligning with evolving regulations.

Whether battling a vineyard-threatening pathogen or planning an orchard removal, here's how to act decisively—without risking fines or community backlash.

Regulatory Context: A Near-Total Ban on Open Burning

The San Joaquin Valley's near-total ban on open burning, mandated by Senate Bill 705, reflects two decades of progress toward cleaner air—reducing agricultural emissions by over 90%. Yet this sweeping prohibition carries a carefully measured exception: burning diseased vines or trees is permitted only when failure to act risks catastrophic consequences to the region.

Why Does This Exemption Exist?

Open burning is no longer a routine disposal method—it's an emergency tool. The exemption exists for scenarios where:

- A highly contagious pathogen or pest threatens to spread uncontrollably, jeopardizing not just a single farm but entire regional crops such as with a newly introduced pathogen
- No alternative disposal method (chipping, soil incorporation, etc.) can effectively neutralize the threat due to technical, logistical, or economic barriers.
- Immediate action is required to prevent irreversible economic loss or long-term environmental harm.

This exemption isn't a loophole—it's a failsafe. It acknowledges that while air quality is paramount, the valley's agricultural backbone cannot survive without a last-resort option to address existential threats. However, the process is designed to be exhaustive, not expedient, ensuring exemptions are granted only when the stakes justify the risk. Most pest and diseases do not necessitate burning to protect the health of the agricultural industry in the San Joaquin Valley. As this exemption is a key tool to respond to emerging diseases, a list of qualifying pest and diseases does not exist. Applications will be evaluated on a case-by-case basis and only be granted when absolutely necessary.

How to Apply for a Disease Exemption

Navigating the process to secure a burn permit for removing diseased vines or trees requires careful coordination between growers, the County Agricultural Commissioner's Office, and the San Joaquin Valley Air Pollution Control District (SJV APCD). Here's what you need to know:

Step 1: Documenting the Threat

Before contacting regulators, growers must gather concrete evidence of the disease or pest infestation threatening crops. This starts with completing the SJV APCD's Diseased Agricultural Material Form, introduced in July 2024 to simplify the process. The form requires:

- A detailed site map outlining the affected area, including the property's address or APN number, acreage, and specific blocks slated for removal.
- Proof of the pathogen or pest, such as third-party lab test results or field survey reports.

This documentation helps to organize the evidence of disease concerns and ensures transparency in a process tightly regulated to protect air quality and neighboring farms.

Step 2: Working with the Agricultural Commissioner's Office

Once the threat is documented, growers need to contact and the County Agricultural Commissioner's Office, and share your documentation with them. Your County Agricultural Commissioner's Office acts as a critical mediator in the application process and must determine if burning is indeed necessary. Under District Rule 4103 on open burning, their team is responsible for conducting a site-specific evaluation to address two key concerns:

1. There is no economically feasible alternative means of eliminating the disease or pest other than burning
2. There is the presence of a disease or pest that will cause a substantial, quantifiable reduction in yield or poses a threat to the health of adjacent vines, trees, or plants in the field proposed to be burned, during the current or next growing season, or there is the presence of a disease or pest that will cause a substantial, quantifiable reduction in production of animals or fowl

This phase includes a site visit to confirm the acreage, inspect the crop, and cross-reference the grower's claims with the submitted evidence. The Commissioner's Office may then issue a burn support letter to the grower, which becomes the cornerstone of the application.

Step 3: Final Approval from the SJV APCD

With the Commissioner's evaluation in hand, growers submit their complete packet to the SJV APCD. Here, the Air District conducts its own review, focusing on air quality impacts. Even if all agricultural requirements are met, the burn will only proceed if the Air District determines it won't violate federal air standards or create a public nuisance.

Why This Collaborative Approach Matters

The process underscores a shared responsibility: growers must act as stewards of both their crops and the environment, while regulators ensure compliance without stifling agricultural livelihoods. By requiring scientific evidence, exploring alternatives, and prioritizing air quality, the system aims to minimize open burning while addressing genuine emergencies.

The takeaway for growers is clear: Start early, document thoroughly, and engage proactively with the Commissioner's Office and SJV APCD. Delays often arise from incomplete paperwork or missed inspections—not from the rules themselves.

The Bottom Line

The clock is ticking for San Joaquin Valley growers. With tightening burning restrictions, today's choices will shape your farm's future and the valley's air quality legacy. By acting swiftly to critical threats such as new and emerging pest and diseases— properly documentation, engaging early with your Agricultural Commissioner's Office, and seizing incentive programs—growers can turn regulatory challenges into opportunities for innovation. As the disease exemption for agricultural burning is not a loophole but a last resort, only pest and disease threats for which the compete destruction of the crop by burning is the only practical method of control is the use of this exemption warranted. This isn't just about compliance; it's about stewardship. Every acre spared from open burning and every collaboration with regulators and partners like UCCE strengthens the valley's dual identity: a global agricultural powerhouse and a model for sustainable farming. Together, growers, agencies, and UCCE can protect livelihoods, safeguard communities, and ensure the land remains productive for generations.

Facing an unfamiliar pest or disease? UC Cooperative Extension (UCCE) farm advisors may be able to diagnose an unknown pathogen or pest or provide information on laboratories capable of diagnosis and identification. UC farm advisors can provide science-backed information to help you navigate crop removal protocols—helping protect your crop while complying with regulations.

Resources

- **SJV APCD Diseased Material Form**: Download here to begin the process
- **Ag Burning Alternatives Grant Program Information**: SJV APCD Ag Burn Alternatives
- **Rule 4103**: Read the complete regulations on open burning

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March 24th, 2025

To whom it may concern,

Hello, my name is Idong Mokwunye. I am a new UCCE IPM Advisor based at UC Kearney Research and Extension Center, Parlier, CA. In this role, I cover four counties: Madera, Fresno, Kings, and Tulare. To build my entomology-based IPM research and extension program, I am collecting input from people involved in farming, pest management, and allied industries to assess the needs in this area. I appreciate if you can provide your valuable inputs by filling few survey questions below:

The information you provide will allow me to better understand your needs and how to best deliver my program. Survey responses will be used for program planning. Your participation is voluntary, and **your responses will be confidential**.

If you have any questions, or would like to discuss the survey, please feel free to contact me. My contact information is included below.

I look forward to working with you and thank you for your continued collaboration with the University of California.

Sincerely,

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Scan this QR code from your mobile device to complete the survey online instead!