

Sacramento Valley Walnut News

Fall, 2023

In This Issue

- Fall Walnut Considerations
- Freeze Reminder
- Cover Crops for a Wet Winter
- Nematode Management in Walnut
- Meeting Save the Dates
- Trees-to-Tomatoes
- Walnut variety trial Introduction
- New Advisor Introduction
- Sacramento Valley Orchard Source

Submitted by:

Becky Wheeler-Dykes

UCCE Farm Advisor
Glenn, Tehama, and
Colusa Counties

Glenn County UCCE
Office: (530) 865-1107
Fax: (530) 865-1109

Fall Walnut Considerations

Jaime Ott, Orchard Systems Advisor, Tehama, Shasta, Glenn, and Butte Counties

Harvest is just around the corner, and the management decisions you make between now and then can affect the quality of, and return on, your crop. Post-harvest management is also crucial to prepare your orchard for winter and next season.

Pre-Harvest

If you plan to use [ethephon](#), monitor packing tissue brown starting 35 days before your expected harvest date. Your ethephon application timing will depend on whether your goal is to [improve kernel quality with an early harvest or to enable a one-shake harvest](#). Only apply ethephon after 100% of nuts reach packing tissue brown.

Protect your orchard from early frost. For young trees, cut off N fertilization by mid-August and withhold irrigation starting in early to mid-September. For mature trees, cut off N fertilization by early September. See the article on [Minimizing Potential Sudden Autumn Freeze Damage](#) in this newsletter for more detail.

Harvest

Plan a timely harvest: leaving nuts on the tree exposes them to damage by navel orangeworm (NOW) and leaving them on the ground reduces quality and increases the risk of mold. Plan to pick nuts up on the same day you shake.

Collect a nut sample from across each orchard block to evaluate the efficacy of your IPM program. Grade sheets don't give the detail you need to determine where damage is coming from. Compare damage in your samples to [this post on Harvest Damage Evaluation for Walnuts](#) to determine how you can improve your IPM program next year.

Set your frost alarms no later than mid-October.

Post-Harvest

Sanitize orchards to remove mummy nuts that harbor overwintering NOW. By mid-March, blow nuts into row middles and flail mow. If you saw high NOW damage in your IPM evaluation, you may consider shaking remaining nuts out of trees prior to flail mowing. Clean out processing facilities which are adjacent to orchards.

If you are removing and replanting an orchard, October is the time to kill roots with Garlon. It is critical to paint stumps with Garlon within five minutes of cutting trunks and leave stumps for 60 days.

If you are planning to prune this year, prune as early in the fall as possible to avoid *Botryosphaeria* infections. Avoid making pruning cuts when wet weather is forecasted.

If leaf samples indicated potassium deficiency, consider fall bandings of potassium sulfate or potassium chloride (KCl). If you're considering KCl to save money, be sure that the chloride will be able to leach out of the root zone before spring leaf-out. Avoid using KCl where there is a perched water table, heavy clay, or less than 8" of winter rainfall.

With a wet winter predicted this year, you may consider planting a cover crop to help increase infiltration and prevent ponding. Cover crops should be seeded before leaf drop. See the article on cover crops in this newsletter for more information.

Please note: Any mention of a chemical is not a chemical recommendation, merely the sharing of research results. Always read the pesticide label, the label is law.

Links:

- Ethephon: <https://www.sacvalleyorchards.com/walnuts/ethephon-for-earlier-harvest/>
- Improve Kernel Quality with an Early Harvest or to Enable a One-Shake Harvest: <https://www.sacvalleyorchards.com/blog/walnuts-blog/should-you-use-ethephon-in-a-lean-price-year/>
- Pont on Harvest Damage Evaluation for Walnuts: <https://www.sacvalleyorchards.com/walnuts/insects-mites-walnuts/harvest-damage-evaluation-for-walnuts/>



Minimize Potential Sudden Autumn Freeze Damage

Luke Milliron, UCCE Farm Advisor Butte, Glenn, and Tehama Counties; Jaime Ott, Orchard Systems Advisor, Tehama, Shasta, Glenn, and Butte Counties; Janine Hasey, UCCE Farm Advisor Emerita; Joe Connell, UCCE Farm Advisor Emeritus

Damage from a sudden autumn freeze can occur when trees experience freezing temperatures prior to going into dormancy. With sudden autumn freeze damage occurring in three of the last five years, preparing for these freeze events needs to be a regular part of every walnut grower's summer and fall orchard operations. The best approach to escape damage from a fall freeze is to have frost alarms ready and turned on by October 15, completely rehydrate trees after harvest, and actively irrigate during frost events.

Steps to Prepare:

1. Tender new growth is most vulnerable to freeze damage: prevent trees from pushing late-season growth by cutting off N applications by mid-August (young trees) or early September (mature trees).
2. For young trees, withhold irrigation starting in early to mid-September, waiting to resume irrigation until after a terminal bud (left photo) is set on the trunk. After the terminal bud has set, resume irrigation to avoid tree stress and defoliation. For bearing trees, terminal buds usually set as a side effect of the water cutoff done ahead of harvest.
3. Keep groundcovers cut to 2 inches or less starting in mid-October. This allows sunlight to reach the soil surface, storing heat for a warmer orchard through the night.
4. Rehydrate trees immediately after harvest, and actively monitor soil moisture and freeze predictions (usually from mid-October through December) until trees are acclimated to frost (see note below). Trees with adequate soil moisture are better able to withstand low temperatures without damage than trees in dry soil. This is because water-filled spaces in the soil conduct and store more heat than empty airspaces. If a freeze is predicted and the soil is dry, it should ideally be wetted 2 to 3 days before a freeze event. Light irrigation to moisten a dry soil surface the morning before a frost will help obtain the greatest heat storage for re-radiation at night (if there is no ponding going into the freeze event).

- Some growers with the ability to actively irrigate during sudden autumn freeze events have reported great success in preventing damage. We know from work in almonds that active frost protection can achieve as much as 4 degrees of warming with solid set, 1-2 degrees with micro-sprinkler, and maybe even some benefit running a drip system.

When do you no longer have to worry about preparing for the next freeze? Fully dormant mature healthy trees can tolerate temperatures to the low 20's (°F) or below. We believe walnuts acclimate by having the first mild frost events in autumn with lows near or just below 32° F. However, we do not know how many mild freezes are required to acclimate trees in autumn. If the soil is dry ahead of the third, fourth, and maybe additional freeze events – it's better to irrigate and be safe if you can do so. In addition, consider keeping up your freeze response program longer into fall or early winter for younger orchards with lots of current season's growth.

If you suspect freeze damage occurred, cut into the branches shortly after the freeze event and check the tissue for drying or browning (right photo). Sunburn after freeze can further damage tissue on the southwest side of the tree. Paint the southwest side of damaged trees with 50% diluted (1:1 water to paint) white interior latex paint. Painting up to a week after the freeze event can reduce additional damage by half or more. You can learn more about freeze recovery in our article [2020 Walnut Freeze: Road to Recovery](#).



Left: Withhold irrigation until a terminal vegetative bud sets on the trunk. **Right:** After a severe freeze event cut into the southwest-facing trunk, looking for dark brown discoloration of the cambium (photos: Janine Hasey).



Plant Cover Crops Now to Prepare for Another Wet Winter

Curt Pierce, Irrigation and Water Resources Advisor for Glenn, Tehama, Colusa, and Shasta Counties
Clarissa Reyes, Orchard Systems Advisor, Sutter-Yuba, Butte & Placer Counties

Weather forecasts for the upcoming winter months are leaning heavily toward another wet and cold winter due to the predicted *El Niño* conditions. Unlike last year, however, our reservoirs are already full, or close to full, going into this new water year. This is true for storage basins across the northern Sacramento Valley, due largely to the heavy mountain snowpack from last winter being ideally time-released over the summer months. Should *El Niño* bring heavy rainfall back to the region, any on-farm water capture that can be done should be done to keep as much water locally banked as possible. The weeks immediately following harvest present the best time of the year to plant cover crops to reap their various benefits in the months ahead.

So what are those potential benefits? Well, in the context of cold, winter rains, there are two primary components of orchard management that you should be considering:

Infiltration

Last winter, we published the article [Vegetation for Infiltration](#) which offered guidance on how to best capture any winter rain that may fall after several consecutive years of drought. Of course, by the time the article was published after the holidays, the rain had started to fall, and continued to fall, and it became clear just how large a role vegetation in the orchard can play during sustained rain events.

Standing water in an orchard indicates that the rate of precipitation (rainfall or irrigation) is exceeding the infiltration rate of the soil. Last year, orchards with vegetation in the middles typically had far less standing water than those with bare soil. Standing vegetation physically slows the flow of water across the orchard floor, and the roots of any native or cropped vegetation create downward channels, deep into the soil profile. These channels increase the rate at which water percolates through these soils when compared to soils left bare (Figure 1). The combined effect is overall increased infiltration and water storage in the soil profile and underlying aquifer due to reduced runoff from the soil surface.



Figure 1. Photos: Curt Pierce, Jan 2023

Frost Protection

Moisture in the soil profile helps to hold soil temperatures slightly higher than that of dry soil. However, if water has ponded on the soil surface, the sun's heat is reflected up and away so that it cannot further warm the soil. During nighttime hours, when the sun has set and temperatures drop, those few degrees of higher soil temperatures can make the difference in frost damage being sustained by your trees or not. With vegetation in the orchard, water from precipitation (or irrigation) can be more effectively introduced to the soil profile where it can aid in this warming effect. You will want to keep any vegetation in the orchard managed, though, as taller stands will block the sun's rays and keep them from warming the soil just as ponded water can. Aim to keep any vegetation from growing much over 2" or so by

mowing as needed - hopefully when the orchard is dry to prevent any unnecessary compaction from equipment in the lanes.

Check out [Cover Crops for Walnut Orchards](#) for more detailed guidance and information.

Links:

- Vegetation for Infiltration: <https://www.sacvalleyorchards.com/blog/almonds-blog/vegetation-for-infiltration/>
- Cover Crops for Walnut Orchards: <https://anrcatalog.ucanr.edu/pdf/21627e.pdf>



“Field Visit: Nematode Management in Walnut” was held in Escalon, CA

Andreas Westphal, Ph. D., UC Riverside Professor of Cooperative Extension Nematology

Establishing a new walnut orchard is a long-term investment that requires detailed planning to enable 35 to 40 years of bountiful and sustainable production. Among other soil-borne maladies, soil-dwelling plant-parasitic nematodes can severely damage walnut. On susceptible rootstocks, root lesion nematodes, *Pratylenchus vulnus* (RLN) can increase to high numbers over time, reaching damaging levels in established orchards, and frequently old orchards leave behind populations of this nematode. RLN is estimated to be present in 85% of California walnut orchard soils. This nematode is highly damaging with a population density of one nematode per 250 cc of soil potentially reducing the growth of a newly planted orchard. Because it can inhabit the upper 5 ft of soil its suppression is challenging. After the ban of methyl bromide fumigation in 2005, alternative fumigants containing 1,3-dichloropropene (1,3-D, Telone) are increasingly regulated. Regulation to start on January 1, 2024, will make 1,3-D use more expensive and potentially less effective.

A California Walnut Board-supported trial was planted in 2021 to ‘Livermore’ walnut on seedling ‘Paradox hybrid’ rootstock following an old walnut planting. In August 2023, a field meeting was held at the trial on the farm of Robert Longstreth in Escalon, CA. The previous orchard had been removed in winter 2020, and the ground deep ripped and leveled. Experimental preplant soil treatments were applied in August 2020. These included the AITC-containing material Dominus, Reklemel (Salibro) (both not currently registered), Velum One, and different forms of anaerobic soil disinfestation (ASD). All treatments received 6-acre inch of water on treatment day except the comparative treatment of Telone II – chloropicrin application. In anaerobic soil disinfestation, easily decomposable substrates are spread on the soil surface, incorporated, drip irrigation lines installed, and totally impermeable film (TIF) used to cover the soil to exclude atmospheric oxygen. Under heavy irrigation, the process starts and microorganisms decompose the substrate, the aerobic microbes eventually deplete the soil oxygen, so anaerobic microbes become dominant and continue decomposing the material while producing secondary metabolites. The created conditions reduce nematode population densities. The potential and limitations of the different treatment options were discussed. In general, alternative preplant soil treatments resulted in less tree growth than Telone fumigation but several of them improved growth over the non-treated control. It remains challenging for treatments to compete with a properly done fumigation, but treatment programs are being developed. A more comprehensive field day covering more soil treatment options and additional management tools including improved rootstocks is planned at the Kearney Agricultural Research and Extension Center in Parlier in the fall of 2023.



2024 Sacramento Valley Orchard Meeting Save the Dates!		
Thursday, January 18, 2024 12:00 -2:00 p.m.	Third Thursday Things in the Field Lunch	Orland, CA
Tuesday, January 30, 2024	Colusa Winter Almond Meeting	Arbuckle Golf Club Arbuckle, CA
Wednesday, January 31, 2024 7:00 a.m. to Noon	North Valley Nut Conference	Silver Dollar Fairgrounds Chico, CA
Thursday, February 1, 2024 7:30 a.m. to Noon	Northern Sacramento Valley Prune Day	Elk's Lodge Red Bluff, CA
Tuesday, February 20, 2024 7:30 a.m. to Noon	North Sac Valley Olive Day	Orland, CA
Thursday, February 22, 2024 7:30 a.m. to Noon	Northern Sacramento Valley Walnut Day	Elk's Lodge Red Bluff, CA
Tuesday, February 27, 2024	South Sacramento Valley Prune Day	Sutter County Ag Yuba City, CA



Tomato Following Walnut: Considerations and Tips

Patricia Lazicki, UCCE Vegetable Crops Advisor for Yolo, Solano, and Sacramento Counties

Walnut prices have greatly declined in recent years. As a result, we're seeing walnut orchards pulled with the expectation that several thousand acres may be removed over the coming years. Some of that ground will be going into tomato.

There are some concerns about growing tomatoes on old walnut ground, but very little formal research exists in this area. To support grower decision-making in the absence of this information, I reached out to processors and growers for their thoughts on how to make the transition successfully.

Processors' Concerns

Old walnut ground presents some special challenges for tomato harvest. I spoke with representatives from several canneries to get their thoughts on what to be aware of, and tips for avoiding expensive problems.

What are some of the issues you've seen with harvesting and processing tomatoes that have come out of walnut:

Woody material can both slow down the harvest and end up in the load. Canneries have zero tolerance for woody materials, as they can damage processing equipment, plug sieves, and can cause plant shut-down for cleaning. Nuts in the load will also cause it to be rejected, as potential allergens. Roots are especially an issue, since a field may look clean but have many roots below the surface that will be brought up by the harvester. Roots may also not be recognized by the dirt sorters. If detected as MOT (material other than tomato), large wood chunks mean a big deduction for the grower. Wood or nuts not showing up in the Processing Tomato Advisory Board (PTAB) sample but detected while the load is being dumped can lead to the load not being processed. As well as being a financial hit for the grower (\$138/ton*26-ton trailer= \$3,588 if reconditioning isn't an option), rejected loads also mean more scrutiny in the future.

How does walnut differ from almond or other crops that leave woody residue? Sunflower, corn, and tomatoes can also leave woody residues in the field. However, woody orchard debris break down more slowly in soil. It can also be less likely to float, making it harder for the processor to sort it out from a load. Walnut orchards are more challenging than almonds as roots can be larger (a 40-year-old orchard can have roots that are 12 feet long and 8 inches in diameter). Large pieces are especially dangerous as they're the most liable to break equipment. They also take more labor to remove and persist longer in the soil.

Have you worked with any fields where the biomass has been chipped and then returned to the soil? Are there any special considerations for these fields?

This practice isn't common, so no specific advice. It would probably depend on how finely the material is chipped. Likely, if chips end up on the harvester, they will be more difficult to sort out than roots and more likely to migrate to the top of the load, therefore they are more likely to show up as MOT.

Any tips for growers to avoid costly penalties?

- Consult first with the processor. Consider growing another crop before putting in tomato.
- Due diligence in root removal. The more labor put in on the front end, the cleaner the loads will be at harvest.
- If tomato is the first crop after a walnut orchard, consider hiring extra sorters to help prevent woody material from entering the load.

Grower Experience

Bullseye Farms is a large Yolo County operation that has experience successfully transitioning fields from walnut to tomato. Their take is that it's expensive and laborious to clean the ground well, but they haven't had problems with the harvest. Higher yields (likely due to low disease pressure) will make it profitable over time.

How do you remove woody materials from the fields? Push the trees over, grind them up, and haul the biomass off. After this, run a ripper through to 2.5 feet and have hand crews pick up the roots, repeat until the field is clean. It's a significant cost; about \$850/acre in labor on top of the cost of the ripping, grinding, and hauling (\$1400-\$1500/acre). The older the orchard is, the more laborious it will be to remove the roots.

What are some issues to watch for when transitioning ground from walnut to tomato?

- **Pre-emergent herbicides** used in orchards can have plant-back restriction periods of up to 18-20 months; it's important to check the dates and products used.
- **Nutrient tie-up** hasn't been a problem when the field was well cleaned, and biomass was removed. Fertility needs haven't differed so far from those of other fields. However, tie-up will likely be more of an issue if chipped biomass is returned to the field.

Any issues that you have had or would foresee where the biomass has been chipped and incorporated? So far, all biomass has been removed. In one field, piles of chips from an orchard that was ripped out in January sat from June to October before removal. In a tomato crop planted the following April, there were poorly performing patches in the areas where the piles had been placed. However, it was unclear if this was due to allelopathy (live walnut trees produce a chemical called juglone that has a negative effect on tomatoes planted near them), nutrient tie-up, or some other cause. The Yolo-Solano Air Quality District Agricultural Chipping Program is offering monetary incentives to use chips on-farm, and there are plans to experiment next year on a limited scale.

How have you seen this transition be most successful? Just put in the labor to really get the roots out and be cautious about incorporating materials.

Take-Home Points

Tomatoes have been successfully grown directly following walnut.

There are risks, and it's important to put in the work after orchard removal to avoid problems at harvest.

If planning to follow walnut with tomato, it could be a good idea to discuss with the processor how you plan to clean the field.

Allowing a transition period of 1-2 years before planting tomato in old walnut ground will reduce the associated risks.

For more information, please contact Patricia Lazicki at 530-219-5198 or palazicki@ucanr.edu.



Introducing a Butte County Walnut Variety Trial

Becky Wheeler-Dykes, Orchard Systems and Weed Ecology Farm Advisor, Glenn, Colusa, and Tehama Counties

A ten-acre Butte County Walnut Variety Trial was planted at the Chico State Farm in May of this year. A collaboration between Chico State, UC Davis Walnut Improvement Program, and UC Cooperative Extension, this variety trial aims to identify new varieties that will perform exceptionally well in this region. The orchard is being managed using conventional practices that are currently industry standard for Chandler production. Eighteen new selections developed by the UC Walnut Improvement Program are planted in the replicated trial, along with Solano, Wolfskill, Howard, and Chandler. All trees are planted on RX1 rootstock on a 26' X 26' spacing with micro-sprinklers. The selections were chosen for qualities including kernel color and size, yield, blight ratings and late flowering dates in preliminary greenhouse and small plot field trials. Early bearing, long-term yield and nut quality, resistance to and avoidance of walnut blight, as well as heat tolerance will be monitored over the next several years.

Generous support from the Walnut Board of California, Sierra Gold Nurseries, Crain Ranch, M&T Chico Ranch, and the staff and management at the CSUC University Farm made this project possible. Additionally, the variety trial was recently awarded funding by the CSU Agricultural Research Institute, which will support ongoing field operations, student involvement and training on the farm, and data collection and testing in the field. We will provide periodic updates on the progress of the variety trial and host field meetings in the years to come, but if you'd like to learn more please contact Clarissa Reyes, Orchards Farm Advisor based in Yuba/Sutter Counties at clareyes@ucanr.edu or Becky Wheeler-Dykes, Orchard Systems and Weed Ecology Farm Advisor based in Glenn County at bawheeler@ucanr.edu.



New Orchard Advisor Introduction

Ryan Hill, UCCE Weed Science and Agronomy Advisor, Tehama, Shasta, and Glenn Counties

My name is Ryan Hill, and I am the new UC Cooperative Extension Weed Science and Agronomy Advisor for Tehama, Shasta, and Glenn counties.



My education and professional background is in weed science and plant genetics. I received a B.S. in Biology from George Fox University in 2014 and an M.S. in Plant Breeding and Genetics from the Department of Horticulture at Oregon State University in 2020. Following graduation with my masters, I took on a faculty research assistant role in Dr. Marcelo Moretti's perennial weed science lab at OSU. In this role I conducted weed research in horticultural crops including several projects on herbicide-induced crop injury. Additional projects included sucker control in hops and hazelnuts, pollinator habitat establishment with pre-emergent herbicides, and electrical weed control of Italian ryegrass.

My family and I have already been blessed by the welcome we have received since we arrived in Tehama County. I look forward to meeting as many members of the walnut-growing community as I can in the coming months. Currently, my main objective is to learn as much as I can about weed control in walnuts and identify areas where research and extension can make a difference in the day-to-day operations of growers. I encourage you to reach out with ideas, requests, or questions relevant to

weed science or agronomic crops as I develop priorities to pursue in my new position. You can reach me at rjahill@ucanr.edu or (530) 527-3101.

Up-to-date *orchard*-related events, news & articles from UC Cooperative Extension *farm* advisors from the *Sacramento Valley*.

Sacramento Valley Orchard Source
Your source for orchard news & information in the Sacramento Valley



University of California
Agriculture and Natural Resources

HOME
BLOG
ALMOND
PISTACHIO
PRUNE
WALNUT
ET REPORTS
PEST REPORTS
EVENTS
ABOUT US
🔍

OTHER RESOURCES
🐦 Follow @SacOrchards

Visit: sacvalleyorchards.com

Walnut Newsletter



ANR NONDISCRIMINATION AND AFFIRMATIVE ACTION POLICY STATEMENT: It is the policy of the University of California (UC) and the UC Division of Agriculture and Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities (Complete nondiscrimination policy statement can be found at <http://ucanr.edu/sites/anrstaff/files/169224.pdf>). Inquiries regarding ANR's nondiscrimination policies may be directed to John Sims, Affirmative Action Compliance officer, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1397.

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar.