

## San Joaquin Pomologist

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# Update: Prepare and Protect Walnut Trees From Future Freeze Damage

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### **Background**

Freeze damage in walnuts is caused by freezing temperatures in the fall. Over the last three years, UCCE Walnut Advisors observed damage in older orchards in Sacramento and northern San Joaquin Valleys where material should be dormant. Often times this also occurs in young orchards where new growth is still being formed during periods of freezing night temperatures. Freeze damage is brown, necrotic tissue, which can appear to be related to pathogens, but no signs of fungal infection are present. Please see Fig. 1 for photos associated to freeze damage.

While green tissue is highly susceptible to freeze damage, dormant walnut tissue is believed to withstand temperatures in the low 20s (°F). Yet bud and wood temperature may fall lower than ambient air temperature, and walnut tissue requires a slow decline of ambient temperature to convert complex carbohydrates to simple sugars during the fall period. These past two autumn seasons experienced rapid declines in temperature, sometimes shifting from 60 ° F to 28 °F within the passing of 12 to 24 hours. This is why we believe we see the erratic patterns of damage in older orchards as well as the typical damage sometimes seen in young orchards.

Walnut growers are concerned about threats from a possible November-December freeze and increased drought across the state. Such a situation requires growers to be more vigilant in preparing for these unprecedented freeze events. We are hoping for rainfall in early November, which could provide a good relief especially for growers who only use surface water.

### **What can be done?**

Although there is limited field based research on the topic, institutional knowledge and field observations may be able to help. Suggestions for freeze damage mitigation include the following:

- Promote healthy trees throughout the season but reduce growth in fall. Cutting back on irrigation in September and no longer applying nitrogen after August helps slow growth and may promote the hardening off process needed before a sudden freeze event comes along.
- For young trees, stop irrigating in September to set the terminal bud (Fig. 2) and harden off the trees, later resume irrigation if needed to avoid tree stress.
- If there is no rain after harvest, apply a regular irrigation before a freeze event so the soil is moist in November. This should keep the orchard slightly warmer and store heat during warm, sunny days. Hydrated trees are expected to be less susceptible to freeze damage.

### ***Got freeze damage?***

UCCE Walnut Advisors are interested in learning more about freeze damage. If you experienced freeze damage over the past few years and have a minute to provide us feedback on your situation, please follow this link:

<http://ucanr.edu/walnutfreezesurvey2021>

More questions?

Please don't hesitate to call. at: (209) 953-6100



**Fig. 1.** Freeze damage in a 9th leaf Solano orchard. Severity of symptoms is variable across and within orchard blocks (damage beneath the bark appears as brown discoloration). @Figure provided by Mohamed Nouri.



**Fig. 2.** Example of a set terminal bud. Photo provided by Janine Hasey.