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THE SCOOP

on fruits and nuts in Stanislaus County

Update: Managing Walnut Mold

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Something has been plaguing walnut orchards for many years without a known cause. Often referred to as Brown Apical Necrosis, or BAN (Fig. 1), growers and PCAs have scratched their heads for years when walnut grades come back dinged due to moldy, off color nuts. Dr. Themis Michailides, a UC Davis Plant Pathologist, recently decided to take a stab at this issue and can now offer a solution. Here is what he and his lab found.

Fig. 1. (Below) Brown Apical Necrosis is shown on the left, not to be confused with Walnut Blight, shown on the right, and caused by the bacterial pathogen, *Xanthomonas arboricola* pv. *juglandis.* Internal tissues in nuts with BAN at this stage do not show any decay and/or black discoloration as do nuts with walnut blight.

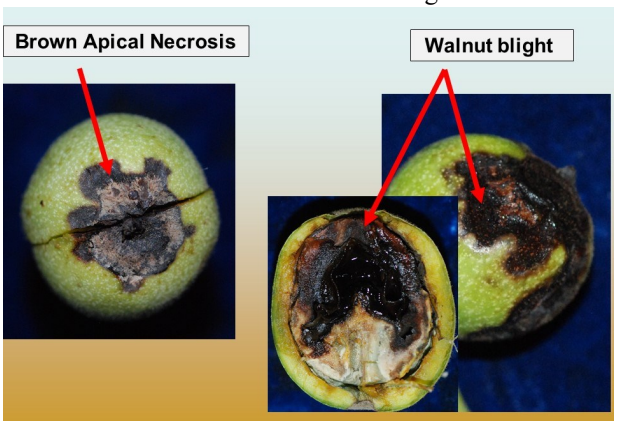

Figure provided by Themis Michailides.

After collecting samples and isolating various types of fungi from both nuts, hulls, and BAN tissues, the Michailides lab at the Kearney Agricultural Research and Extension Center in Parlier, CA consistently found *Alternaria, Fusarium, Aspergillus niger, Botryosphaeria* and *Phomopsis* present, please see Fig. 2. *Botryosphaeria* and *Phomopsis* we know from previous work can be managed by pruning dead/diseased wood/spurs, pruning after harvest in the fall, reducing sprinkler angles to avoid wetting tree limbs and depending on severity, fungicide sprays applied in mid-May, mid-June, and mid-July (further product information can be found at http://ipm.ucanr.edu/). Yet the other three fungi, *Alternaria, Fusarium,* and *Aspergillus niger* were not considered pathogens on walnut. By performing a variety of tests both in the lab and in the field, the Michailides lab discovered that these fungi are responsible for walnut mold. Additionally, walnut blight, caused by *Xanthomonas arboricola* pv. *juglandis*, may exacerbate the problem, leading to larger lesions on the hull and the potential for greater damage to the hull and nut.

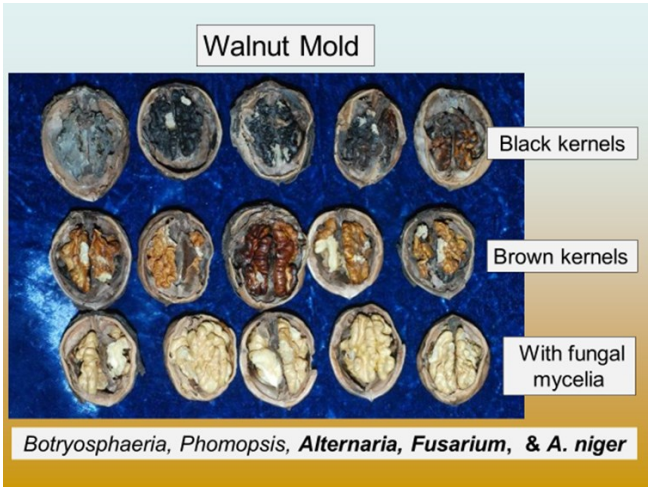

Fig. 2. (Above) Moldy, off color nuts which lead to economic loss due to downgrading.

Figure provided by Themis Michailides.

What can be done?

Applying Merivon at three weeks prior to hull split reduces mold related to *Botryosphaeria, Phomopsis* and *Alternaria*. Adding Tebuconizole to the tank mix will increase efficacy against *Phomopsis*. To further increase efficacy, apply Rhyme at 20-30% hull split. If this high level of control is not needed, apply Rhyme at 20-30% hull split.

Note* Please refer to current label recommendations and restrictions when applying pesticides.

Update: Mitigating Freeze Damage

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Background

Freeze damage in walnuts is caused by freezing temperatures in the fall. Often times this occurs in young orchards where new growth is still being formed during periods of freezing night temperatures. Over the last two years UCCE Walnut Advisors observed damage in older orchards where material should be dormant. 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. 3 for photos associated to freeze damage.

Fig. 3 (Above) 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). Photo provided by Mohamad Nouri.

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.

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. 4) and harden off the trees, later resume irrigation if needed to avoid tree stress.

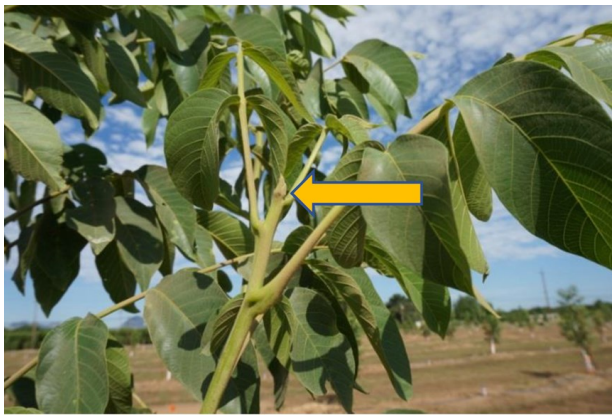

Fig. 4. (Above) Example of a set terminal bud. Photo provided by Janine Hasey.

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. (209) 525-6800.
Stay healthy!