

SACRAMENTO VALLEY WALNUT NEWS



A Regional Newsletter of the UC Cooperative Extension Walnut Farm Advisors

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December 2008

Issue 4: Winter 2008/2009

Managing Walnuts for Cold Temperatures

Carolyn DeBuse, UC Farm Advisor, Solano and Yolo

There are two types of cold damage that can happen to your walnut trees when winter arrives. Autumn frost damage occurs if the temperature drops below freezing rapidly in the late fall or early winter following mild warm autumn weather. This type of autumn frost often damages vigorous non-dormant young trees. The second type is "winter kill" which happens when extremely low temperatures occur during the winter months damaging mature and young dormant trees. Water stressed or trees planted in sandy soil are most susceptible to this type of injury.

Both types of cold damage show similar symptoms of darkening bark and streaks of grey on the inner wood. In the spring, buds are slow to break or fail to break altogether. In cases where the branch dies the winter kill acts as severe pruning and vigorous shoots grow from below the damaged area. Sunburn often accompanies the cold damage increasing the amount of injury. In the harshest instances, entire young trees can die.

Primary steps to reduce the risk of cold injury

1. Hardening off the trees: Hardening off is a process where the tree stops growing and begin to enter dormancy. With a warm autumn and plentiful irrigation, walnut trees may not naturally harden off early enough to avoid frost damage. You should help the trees harden off by withholding irrigation in September. Hold off irrigation until the terminal growth has stopped and there are no new emerging leaves at the shoot tips. Do not let them dry out so much that leaves are turning yellow or dropping. Trees that have been hardened off are less susceptible to damage in an autumn frost
2. Irrigating for winter: Dry trees are more susceptible to cold damage so make sure trees are not stressed as they go into winter. After trees are hardened off in September, restart the normal irrigation schedule and continue until the first rains. The soil profile should be rewetted by beginning to apply the normal ETc that is needed for that time of year. (also see Winter Irrigation article)

Submitted by:

*Janine Hasey, U.C. Farm Advisor
Sutter/Yuba Counties*

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Secondary steps to take if cold injury occurs

- Just after the freeze event: If a freeze/frost occurs in the late fall or early winter before the trees have hardened off or acclimatized, you can reduce the wood damage by painting the trees with white paint. This is effective in reducing damage to young trees after a November frost. Paint the tree trunks and primary scaffolds above the crotch with a whitewash made of white interior latex paint diluted with 50% water. The paint will help prevent sunburn and help heal the damaged wood by reducing evaporation from the injury. In a study by Wilbur Reil, Yolo/Solano Farm Advisor Emeritus, 46% of unpainted trees sustained cold damage while only 8% of the trees painted 8 days after the event showed damage.
- In the spring: If you suspect cold damage, do NOT prune out the damaged limbs. The buds may be slow in opening or buds from deep in the bark may grow to rejuvenate the limb. In the late summer, prune out the dead wood that did not revive. New scaffolds that grew can be trained to replace the damaged wood. Reduce or delay spring fertilizer applications where cold damage is evident.

Winter Irrigation During Drought

Joseph H. Connell, UC Farm Advisor, Butte Co.

We know that during the winter months walnuts can be hurt by either too much or too little water. It's been a dry fall so far and the deep soil profile in most walnut orchards takes significant rainfall to be recharged. Cutting back on water earlier in the fall slows down the trees growth and helps harden them off. However, drought conditions during winter can make winter kill worse if we get cold temperatures as discussed in Carolyn DeBuse's article on winter freeze injury.

So, how do we best apply water during the winter to alleviate drought? If you have water available, I'd suggest a light 1½ to 2 inch irrigation that simulates typical rainfall patterns. If we're still dry in December as you're reading this then beginning to gradually refill the soil profile with occasional 2 inch irrigations would be a good idea starting about now. Keep an eye on rainfall forecasts and amounts of rain received in your neighborhood so your irrigation timing doesn't end up creating a condition where the orchard is too wet. Although unlikely if current conditions persist, saturated soils can kill roots from water logging or can increase the chance of crown or root rots developing. Check soil moisture as the winter progresses to see how deep the soil profile has been re-wetted so you can make sure you don't have dry soil in the root zone. The ultimate goal is to make sure the soil reservoir is completely refilled either by rain or winter irrigations by the time your walnut trees begin to wake up next March.

Guidelines for Planting Walnuts

Bill Krueger, UCCE Glenn County

- Plant only into soil that is at field capacity or drier. Planting into wet soil can cause compaction, rutting and glazed tree holes.
- Make the planting hole just deep and big enough to accommodate the root system using an auger or shovel and plant the tree no deeper than it was in the nursery. Trees can be planted on a mound or a berm to insure good water drainage away from the crown. This can be particularly useful on heavier or poorly drained soils.
- Never allow trees to dry out from the time they are picked up until they are planted. Store them in the shade and cover with a moist blanket.
- Prune broken roots or roots that won't fit in the hole without bending
- If a crown gall preventative spray of K-84 bacteria is used, its success will depend on the strains of crown gall bacteria present in the orchard.
- Spread roots and work the soil around roots, orient the strongest roots in the direction of prevailing winds and, to the extent possible, avoid orienting the bud crook (the flat side opposite where the scion bud emerged) toward the southwest.
- Keep fertilizer and organic material out of the planting hole.
- If the soil is moist and friable, it should not be necessary to water at planting. Work the soil around the roots to insure good soil to root contact. If the soil is dry, water with one to two gallons to establish good root to soil contact and eliminate air pockets.
- Head back nursery grafted trees to 3 to 5 buds above the graft union (usually 15 to 24 inches above the ground) to insure vigorous growth. If planting rootstock that will be field grafted the following year, cut to 12 to 14 inches above the ground.
- Paint trees with a 1:1 mixture of water to interior white latex paint or similar tree whitener that will not peel or crumble to prevent sunburn. Avoid paints which contain mineral oil or refined petroleum which may injure the tree. Make sure paint extends all the way to the base of the trunk at the soil level.
- Check trees after settling and pull up if necessary to make sure that they are not too deep. They should be no deeper than they were in the nursery.
- Stake trees in standard spaced plantings with a stake that extends 8 ft above the ground, placed 8-10 inches away from the tree on the up wind side so that the wind blows the tree away from the stake.

Pruning Tips for One and Two Year Old Walnut Trees

Janine Hasey, UC Farm Advisor, Sutter and Yuba Counties

Young walnut trees are sensitive to freezing temperatures which can kill or damage wood so it is best to delay pruning until March or late February at the earliest. The method used to train young trees will vary depending on whether the planting is a standard- spaced orchard or hedgerow system.

Standard-spaced orchards

Pruning one-year old walnut trees in the modified central leader system:

- The leader, or shoot selected to be the trunk, should have reached a height of at least 7 to 8 feet. Ten feet or more of growth is better. The height at which the leader is headed will establish the height of the first primary scaffold.
- Heading the leader at 8 feet will give more area for the scaffolds. The leader should not be headed any less than 6 ½ feet since the first primary scaffold should be at least 6 feet above the ground so as not to interfere with equipment operation. Make the heading cut into mature round wood.
- Any lateral shoots on the leader should be removed. 1 or 2 nonvigorous shoots arising below the leader can be stubbed to 2 to 3 buds to provide shade on the south and west sides and to aid caliper growth. They will be removed in the next dormant season.
- Any primary buds above 5 feet from the ground that are necked should be rubbed off to the side so as not to damage the secondary bud. If left, necked buds form weak limb attachments that are subject to breakage. The secondary bud which is forced to grow will form a wide angle and develop a strong crotch.
- If the shoot selected to be the trunk has not reached sufficient height, cut it 3 to 6 buds above the point of origin and remove competing shoots. A stronger shoot can then be trained as the trunk over the summer.

Pruning two-year old walnut trees in the modified central leader system:

- The general goal is to select four to six primary scaffolds arising from the trunk in years two and three.
- The first primary scaffold should be at least six feet above ground.
- Select other primary scaffolds to form a spiral pattern around the trunk. Ideally they should be one foot apart vertically, but in reality, try to space them at least eight inches apart.
- Primary scaffolds should never originate directly opposite each other; this will ensure the leader does not get 'choked out'.
- Selected scaffolds should be angled about 45 degrees from the vertical. Limbs with narrower angles or bark inclusions are usually poorly attached and cannot support heavy crops and branches with wider angles of attachment may fail to grow vigorously.
- For lateral bearing varieties (most except Hartley and Franquette), head all primary scaffolds ¼ to ½ depending on vigor and variety. The leader should be left the longest.
- Remove vigorous lateral limbs close to or competing with the main scaffolds. Small branches can be left unheaded to fruit early on vigorous trees.

Hedgerow Planting System

Pruning one-year old hedgerow walnut trees:

- Head the leader (trunk) at about 5 to 6 feet. The buds left below will develop into the tree's framework.
- The lowest framework branch should be a minimum of three feet from the ground; above this, side shoots and necked buds should be removed.

Pruning two-year old hedgerow walnut trees:

- Select a central leader and two to four side limbs that are oriented in opposite directions in the tree row.
- Remove branches below three feet that will interfere with shaking and flat limbs that grow out into the middles.
- Depending on variety and vigor, selected framework limbs should be headed $\frac{1}{4}$ to $\frac{1}{2}$ their length; cut to an outside bud facing into the tree row. Other branches can be left unheaded to fruit early.

Always remove suckers from the rootstock on all trees.

Manex – The Rest of the Story

Richard Buchner, Farm Advisor, Tehama Co.

Farm Advisors Richard Buchner, Bill Olson and UC Berkeley Plant Pathology professor Dr. Milt Schroth, first began experimenting with Manex back in 1993 in Butte and Tehama counties. At that time, copper applications alone were providing very little or no walnut blight control in many walnut orchards. Increasing rates of applied copper or adding iron did not improve disease control. Dr. Schroth identified copper-resistant walnut blight bacteria which was the reason copper alone did not control the disease.

Experimental results quickly documented that copper tank-mixed with Manex dramatically improved walnut blight control. The Emergency Registration (Section 18) was approved and walnut growers had an excellent material to protect their crop. Over the years, copper tank-mixed with Manex has consistently provided very good to excellent disease control in the presence of copper-sensitive and copper-resistant walnut blight bacteria. Year after year, Section 18 renewals were obtained allowing walnut growers (depending on county) to use Manex.

For the last several years, Buchner, Adaskaveg and product manufactures have been working toward full registration of mancozeb, tested as Manzate 75DF and Dithane 75DF. Tests show that these products work equally well as Manex, so switching ethylene bis-dithiocarbamate (EBDC) formulations will not compromise walnut blight disease control. Currently all mancozeb labels are awaiting full registration (Section 3) approval and will have walnut on the label. For 2010, we expect full registration for mancozeb completing the transition without affecting disease control. In summary, the registration process is moving forward and is not an immediate concern.

In the meantime, we expect the California Manex Section 18 to be re-instated for the 2009 season. An immediate concern, however, is product availability. DuPont Crop Protection, the manufacturer of Manex, has maintained the US and California registrations for Manex. United Phosphorous Inc., however, has decided to cancel the US registration for maneb and maneb technical, the active ingredient of Manex. This decision is due, in part, to an ongoing EPA review of EBDC chemistry to consolidate and reduce the uses of fungicides within this class (Manex and Maneb). As a result, DuPont may not have adequate maneb technical to make and supply enough Manex to the market for 2009. To make matters worse, mancozeb is also predicted to be in short supply. Growers that normally use mancozeb formulations for disease control, on a wide range of crops, will also be competing for Manex which will place additional demand on limited supplies. Because of the unpredictable supply situation, the California Walnut Board has requested a Section 18 for Manzate in addition to Manex for 2009. That will give walnut growers a second option. Because the time line for reviewing a new material such as mancozeb (e.g., Manzate) may delay registration until the late spring, a third possible option is other formulations of maneb. Maneb 75DF and other EBDC compounds have been tested in walnut blight research and have been shown to be as effective as Manex when combined with copper fungicides.

Walnut growers cannot purchase Manex until the Section 18 is approved. Thus, California Department of Pesticide Regulation (CDPR) has been requested to re-issue the Section 18 for 2009 in a timely manner to allow walnut growers as much time as possible to locate and purchase Manex or Maneb. Registration decisions are a complicated process which can change as the process moves forward.



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2009 Sacramento Valley Walnut Grower Meeting Schedule

Date	Location	Time	Farm Advisor(s)
January 30 (Friday)	Tehama Co. Walnut Day Red Bluff Elks Lodge 355 Gilmore Road, Red Bluff, CA		Rick Buchner (530) 527-3101 rpbuchner@ucdavis.edu
February 3 (Tuesday)	Butte/Glenn County Chico Walnut Day /Almond Institute Masonic Family Center 1110 W. East Ave., Chico, CA		Joe Connell (530) 538-7201 jhconnell@ucdavis.edu
February 12 (Thursday)	Sutter/Yuba/Colusa Walnut Day Veterans Memorial Hall 1425 Veterans Memorial Circle Yuba City	1:00 pm to 4:00 pm	Janine Hasey (530) 822-7515 jkhasey@ucdavis.edu John Edstrom jpeditstrom@ucdavis.edu (530) 458-0570
March 25 (Wednesday)	Yolo/Solano Walnut Day UCCE OFFICES / Norton Hall 70 Cottonwood Street Woodland, CA	1:00 pm to 4:00 pm	Carolyn DeBuse (707) 784-1320 cjdebuse@ucdavis.edu