



Vine Lines

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August 2007 Issue

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Abscission Agents May Facilitate the Harvest of Raisin Grapes

Matthew W. Fidelibus

The traditional method of raisin making in California relies on hand labor to pick clusters of grapes and place them on paper trays, between the vine rows, to dry. Crews return to the vineyards to turn the trays of fruit, and later to pick up the raisins. Preparing raisins this way may be too laborious for economic sustainability in California, especially in light of recent labor shortages, so the industry is rapidly adopting mechanized raisin making methods. In recent years, most of the mechanically harvested raisins in California have been a product of continuous tray (CT) technology, which employs a mechanical harvester to shake green berries from the vines into hoppers from which they are spread onto a length of

paper known as a 'continuous tray' (CT). The berries dry on the trays and raisins are picked up with a machine.

Though the CT method requires less labor than conventional tray drying, crews are still needed to sever the canes in advance of mechanical grape harvesting. The purpose of cane severance for CT is not to initiate berry drying, but to facilitate berry shatter. Cane severance, about a week before harvest, will dry the cluster rachis and berries tend to separate from a dried rachis intact, with or without capstems. If the canes are not severed before harvest, the berries tend to separate from their clusters as broken, single berries, without their capstems. Broken

berries attract insects, such as dried fruit beetle, and the juice that leaks from them makes the berries sticky which may cause sand and other debris to coat the raisins. Invariably, many canes are overlooked and berries from these unsevered canes, can reduce the overall quality of the crop.

Abscission agents identified in other crops have been shown to loosen the attachment of fruits, but no agents tested, including ethephon, enhanced loosening of grapes well enough to replace cane severance. However, untested, but promising, abscission agents should continue to be evaluated as an effective compound could further reduce the industry's reliance on labor and, possibly, improve raisin quality.

(Continued on page 2)

Vine Lines Now On-line!

In an effort to disseminate information to grape growers and allied industry faster, *Vine Lines* is now available on-line. Interested parties can sign up for the e-version at the following link: <http://ucanr.org/vinelines>

Once signed up, subscribers will be notified via e-mail that the newsletter is available. An archive of past issues of *Vine Lines* can be found at the same link.

Abscission Agents

(continued from page 1)

Therefore, we treated 'Thompson Seedless' grapevines with various putative abscission agents, and evaluated their effects on fruit drop, fruit detachment force, and vine health.

Material and methods

Experiments were conducted on 40-year-old 'Thompson Seedless' grapevines, at the Kearney Agricultural Center, Parlier, California. Plots consisting of vine sections (within-row spaces between two adjacent vine trunks) of uniform appearance and crop load were assigned to one of 23 different treatments in a randomized complete block design replicated four times. Each plot was surrounded by non-treated vines within and between rows. Eight different putative abscission agents were evaluated at one or more concentrations such that there were 21 different experimental solutions. Control plots were treated with solutions containing the adjuvant only, and harvest-pruned (HP) plots were subjected to cane severance but were not treated with any solution. The soil surface within each plot was covered with ground cloth to collect any abscised berries.

Treatments were applied on 2 September 2006. Ten days after treatment (DAT), berry abscission was observed in plots treated with methyl jasmonate or coronatine. In those plots and in the control and HP plots, all abscised berries were collected into paper bags and placed in a forced air oven (60 C) until they reached a constant weight. Then, clusters of grapes from all the plots were carefully harvested from the vines and

brought into a laboratory where fruit detachment force (FDF) measurements were made. The condition of detached berries was observed, and each berry was then placed in a paper bag along with all the other berries harvested from that plot. Then these berries were also placed in the forced air oven and dried to a constant weight. The proportion of berries that abscised from the vine was calculated on a dry weight basis by dividing the dry wt of the abscised berries in each plot by the combined wt of the retained and abscised berries in that plot. Finally, the vines in each plot were inspected visually and assigned a rating of 0 (no obvious foliar damage) to 3 (appearance of severe foliar damage). All data were subjected to analysis of variance using the general linear models procedure of SAS statistical software (SAS Inst., Cary, NC). Duncan's New Multiple Range Test was used to separate treatment means.

Results

Of the many putative abscission agents tested, methyl jasmonate (MeJA), a natural plant hormone, and coronatine, a biological mimic of MeJA, were the most effective. Fruit detachment force decreased as concentration of MeJA increased, within the range tested (0.2 to 20 mM). In fact, concentrations of ≥ 10 mM MeJA were supraoptimal because they induced considerable abscission of 'Thompson Seedless' berries. Regardless of the concentration applied, berries detached from MeJA-treated clusters sustained much less mechanical damage than berries from non-treated clus-

ters. Nearly all berries treated with MeJA or coronatine detached at the pedicel, leaving only a dry scar on the surface of the berry. In contrast, berries harvested from vines subjected to HP generally retained their pedicels. Pedicels are difficult to remove from raisins, and their presence reduces raisin quality. Destemming, which occurs in the packing house, causes mechanical damage to raisins which limits their shelf life. It is anticipated that raisins made from grapevines treated with MeJA or coronatine will not have any capstems to remove. Thus, application of these abscission agents to grapevines may facilitate the harvest of individual berries having minimal mechanical damage.

Treatment with methyl jasmonate caused little or no canopy damage in contrast with HP which destroys between 50% and 70% of the grapevine's leaves at harvest, a time when such leaves may be needed to replenish the vine's carbohydrate reserves and to fix inorganic nitrogen into amino acids. Methyl jasmonate treatment seemed to promote senescence of leaves in the interior of the grapevine canopy, but these leaves contribute few photoassimilates to the vines. Our findings indicate that MeJA and coronatine warrant further testing as harvest aids for grapes.

Matthew Fidelibus is a UC Cooperative Extension Viticulture Specialist at UC Kearney Agricultural Center.

Treated Wood Stake Disposal

The Natural Resources Conservation Service (NRCS) is presently offering an Air Quality enhancing cost-share incentive program to growers in California who live in areas classified as Serious Non-Attainment for PM-10 (particulate matter smaller than ten microns). This cost-share program is designed to assist growers in disposing of chromium copper arsenate (CCA) wood stakes to authorized disposal sites. While all growers with CCA-treated stakes are eligible to apply for cost share assistance, this program is designed to target growers with existing piles of treated wood stakes as having the highest priority. With limited resources available, the priority is to remove the threat of accidental combustion as well as reducing potential damage to underground and surface waterways. California counties currently eligible to participate in the Air Quality Grape Stake Disposal program are: Fresno, Kern, Kings, Madera, Merced, Riverside, San Joaquin, Stanislaus, and Tulare.

Program Guidelines:

500 - Obstruction Removal

- Application deadline date is November 1, 2007, for the 2008 season (date subject to change)
- The program is designed to obtain the greatest and most immediate reduction of emissions
- All CCA-treated wood products used as support structures for crops are eligible for cost share funds, regardless of crops
- Priority will be given to existing stacks
- The minimum contract length is two years
- Cost share assistance will be available one time per site location
- Growers that have switched to other materials for support systems will have a higher priority
- Cost share rate: \$125 per acre (based on 1.5 tons of material per acre)
- Maximum of 310 tons (approximately 200 acres) per contract
Cost sharing will be allowed on loading, transportation, and disposal of CCA-treated stakes
- Disposal will be at approved landfills only

California NRCS Approved Practice Cost Share Rates

Particulate Matter (PM-10) Reduction Initiative – Treated Wood Stake Removal

| | |
|--|--|
| Cropland Particulate—Management Practice Code 500 on agricultural cropland | |
| Option 1 | Installation of Obstruction Removal—Minimum of 2-year EQIP contract with approved practice designed to mitigate emissions from open burning of treated wood stakes. Allowable cost share components include: loading, transportation and disposal and approved landfill. |
| Cost Share | \$125/ac (based on 1.5 tons of material per acre) - 200ac maximum |

Red Imported Fire Ant in the San Joaquin Valley

New colonies of red imported fire ant (*Solenopsis invicta*) were recently found in Stanislaus County. Native to South America, red imported fire ants (RIFA) are very aggressive, biting and stinging anything near their colony entrance. RIFA have been previously identified in the SJV before, hitchhiking on bee hives moved throughout the state prior to almond bloom. Capable of killing animals much larger than itself, RIFA will swarm and sting its victim several times in concert with colony siblings. The recipient of the concentrated venom will feel a burning sensation at the point of injection, eventually blistering at each sting site. Children or the infirm should seek medical attention immediately if attacked.

It is very important that growers monitor for RIFA so colonies can be eradicated as soon as possible. Growers should call the California Department of Food and Agriculture (CDFA) hotline for RIFA suspect colonies found on their properties at 1-888-434-7326. Growers and workers should use the following guidelines to monitor and manage RIFA on their property.

Monitoring for RIFA

RIFA is related to the common southern fire ant (SFA), *Solenopsis xyloni* found in California. Size and coloration of the workers are similar although RIFA tends to be a bit darker than SFA. Young RIFA nests are difficult to differentiate from SFA but established colonies will have mounds of soil that are approximately one foot high by one foot wide with high ant activity. Resembling gopher mounds, RIFA ant mounds are frequently made near a water source such as a faucet, drip irrigation or near flooded rows between vines or trees.

- If a RIFA colony is found it is important to survey a large area around the mound since a colony can move overnight to new locations. New colonies can also be formed when mating flights take place. Surveys should cover a minimum of a ½ mile radius from the initial colony.
- Look for afternoon ant flights taking place after a spring or fall rain. Flights indicate that established colonies are near and new ones will be formed.

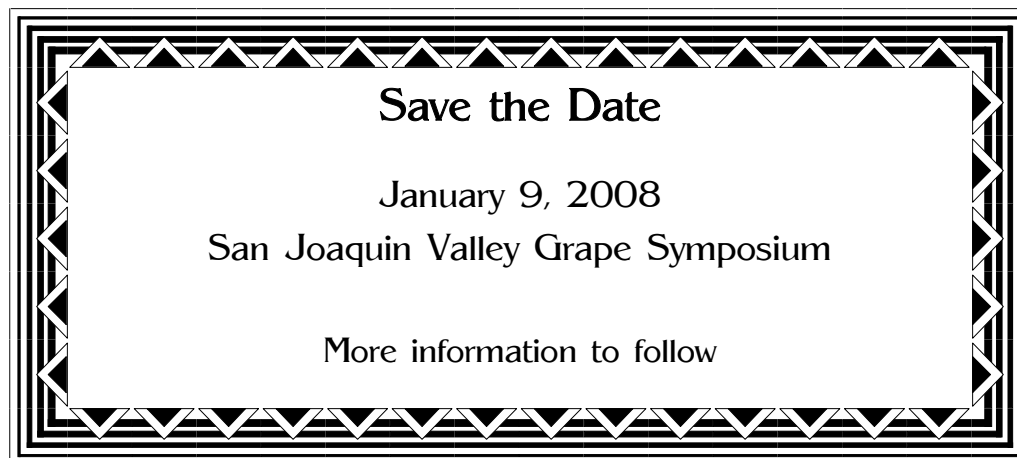
Management of RIFA

RIFA is a quarantined pest. Contact your local county agricultural commissioner or the CDFA to have ants on your property properly identified. Proper identification will help determine what management strategies including eradication will be needed. If ant samples need to be collected, extreme caution should be taken since a percentage of the human population is allergic to RIFA venom.

RIFA online information

UC IPM: <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7487.html>

CDFA: <http://www.fire-ant.ca.gov>



Calendar of Events

Local Meetings and Events

San Joaquin Valley Grape Symposium

January 9, 2008
7:30 a.m. — 12:00 p.m.
C.P.D.E.S. Hall
172 W. Jefferson Avenue
Easton, California

U.C. Davis University Extension Meetings

(800) 752-0881

Establishing the Small Vineyard

October 27, 2007
9:00 a.m. — 4:00 p.m.
198 Young Hall, East Quad
Davis, CA
Instructor: Donna Hirschfelt and Ed Weber
Section: 072VIT210

Public Relations for Small Wineries

November 2, 2007
9:00 a.m. — 4:00 p.m.
Da Vinci Building, 1632 Da Vinci Ct.
Davis, CA.
Instructor: Rusty Eddy
Section: 072VIT204

Current Issues in Vineyard Health

November 14, 2007
9:00 a.m.— 4:00 p.m.
Da Vinci Building, 1632 Da Vinci Ct.
Davis, CA
Instructor: Deborah Golino
Section: 072VIT201

Introduction to Wine Analysis for Professional Winemakers and Winery Lab Workers

December 8, 2007
8:00 a.m.— 6:00 p.m.
123 Enology Building, California Avenue
Davis, CA
Instructor: Michael Ramsey
Section: 072VIT205

Publications from the University of California



Weeds of California and other Western States, 2007

ANR Publication 3488
Price - \$100.00 + tax and shipping

This easy-to-use guide is the most comprehensive guide available on weeds in the Western United States. Package includes a CD of all of the photographs from the book.



Wine Grape Varieties in California, 2003

ANR Publication 3419
Price - \$30.00 + tax and shipping

A comprehensive variety publication. Covers all the grape growing districts in California, highlighting 36 major varieties.

Order Form

| Publication | Qty. | Price | Subtotal |
|----------------------|------|----------|----------|
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| Wine Grape Varieties | | \$ 30.00 | |

| Shipping – USA Only | | Merchandise Total: |
|---------------------|-----------------|--------------------------------------|
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| \$1—29.99 | \$6 | Shipping Based on Merchandise Total: |
| \$30—39.99 | \$8 | Total Enclosed: \$ |
| \$40—49.99 | \$9 | |
| \$50—79.99 | \$10 | |
| \$80—99.99 | \$12 | |
| \$100+ | \$15 | |

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