HEALTHY FOOD SYSTEMS • HEALTHY ENVIRONMENTS • HEALTHY COMMUNITIES • HEALTHY CALIFORNIANS

University of California
Agriculture and Natural Resources
Making a Difference for California

UC CE

Vine Lines

Fresno County

February 2012

Stephen J. Vasquez,
Viticulture Farm Advisor

In This Issue

Pocket Gopher Control Methods in a Field Setting

Roger A. Baldwin

Pocket gophers, often called gophers, are burrowing rodents that get their name from the fur-lined, external cheek pouches, or pockets, they use for carrying food and nesting materials. Pocket gophers are well equipped for a digging (Fig. 1), tunneling lifestyle with their powerfully built forequarters; large-clawed front paws; fine, short fur that doesn't cake in wet soils; small eyes and ears; and highly sensitive facial whiskers that assist with moving about in the dark. A gopher's lips also are unusually adapted for their lifestyle; they can close them behind their four large incisor teeth to keep dirt out of their mouths when using their teeth for digging.

Damage

Pocket gophers often invade vineyards and orchards, feeding on grapevines or and trees. A single gopher moving down a vine row can inflict considerable damage in a very short time by girdling young grapevine trunks (Fig. 2).

(Continued on page 3)

Additional Web News

Fruitfulness of DOV Raisin Cultivars

Matthew Fidelibus

The purpose of this study was to develop cane length, bud fruitfulness, and productivity data to help guide pruning decisions for dry-on-vine raisin grape cultivars. An experiment was conducted in an overhead arbor DOV vineyard at the Kearney Agricultural Center, Parlier, CA. The vineyard, established in 1996, is divided into six blocks each containing plots of 'Thompson Seedless', 'DOVine', 'Fiesta', and 'Selma Pete' grapevines. Each plot is comprised of six adjacent vines of a given variety in each of three consecutive rows. The plots were divided into two subplots having three adjacent vines in a row in each of three consecutive rows. The subplots were randomly assigned to extended cane or standard cane treatments. Vines in plots assigned to the extended cane treatment were pruned in winter leaving six 20-node canes per vine, whereas vines in plots assigned to the standard cane

(Continued on page 4)

Three Root-Knot Nematode Resistant Rootstocks Released By USDA-ARS

Peter Cousins

Root-knot nematodes are a chief pest of vineyards across California and the United States, but aggressive and virulent nematode populations can feed on and damage many important rootstock varieties. The USDA-ARS breeding program tests the root-knot nematode resistance of rootstocks and wild grape species and combines nematode resistance and other useful traits through hybridization. We then evaluate the pest resistance, viticultural performance, and other important qualities of the new seedlings to identify candidate rootstocks. Three improved root-knot nematode resistant rootstocks: Matador, Minotaur and Kingfisher were released from the USDA ARS breeding program in 2010 and are available from FPS.

Matador and Minotaur resulted from selection of seedlings in a population derived from controlled hybridization of the *Vitis* hybrid rootstock 101-14 Mgt (seed parent) with the *Vitis* hybrid rootstock selection 3-1A (pollen parent). 3-1A is a cross of *V. mustangensis* and *V. rupestris*. Matador and Minotaur are full sibling rootstocks, with the same seed and pollen parent. Matador and Minotaur are easily rooted from dormant cuttings and bench grafted to *Vitis vinifera* scions.

Matador was identified as a seedling selection on July 15, 2002 and Minotaur was identified as a seedling selection on July 2, 2002 due to their complete suppression of root-knot nematode reproduction in greenhouse evaluation. The nematode population used to evaluate resistance was an N-virulent nematode population capable of feeding on and damaging N-allele grapevine rootstocks, such as Harmony and Freedom. Root-knot nematode resistance was confirmed in replicated tests of cutting grown plants.

Dormant cuttings collected from plants grown in a California vineyard were evaluated for rooting ability: 73% of dormant cuttings of Matador successfully propagated and produced callus, shoots, and roots; and 92% of dormant cuttings of Minotaur successfully propagated and produced callus, shoots, and roots. Matador and Minotaur were grafted to Syrah and planted into a rootstock trial at UC KREC, Parlier, California in 2005.

When four years of fruiting data and three years of pruning weight data are considered, vines grafted on Matador rootstock showed a fruit to pruning weight ratio of 9.43; and vines grafted on Minotaur rootstock showed a fruit to pruning weight ratio of 8.84. The check rootstock, Freedom, showed a fruit to pruning weight ratio of 6.14, demonstrating the improved production efficiency of Matador and Minotaur rootstock compared to Freedom.

Kingfisher resulted from selection of a seedling in a population derived from controlled hybridization of the *Vitis* hybrid rootstock selection 4-12A (seed parent) with *Vitis riparia* (pollen parent). 4-12A is a cross of *V. x champinii* Dog Ridge and *V. rufotomentosa*. The original Kingfisher vine was planted in 2002. In addition to nematode resistance and propagation evaluations, Kingfisher has been evaluated grafted to Syrah in a rootstock trial in California.

Kingfisher is easily rooted from dormant cuttings and bench grafted to *Vitis vinifera* scions. Kingfisher was identified as a seedling selection on December 24, 2002 due to its complete suppression of root-knot nematode reproduction in greenhouse evaluation. Root-knot nematode resistance was confirmed in replicated tests of cutting grown plants. The nematode population used to confirm resistance was an N-virulent nematode population capable of feeding on and damaging N-allele grapevine rootstocks, such as Harmony and Freedom. Dormant cuttings collected from plants grown in a California vineyard were evaluated for rooting ability; 100% of dormant cuttings of Kingfisher successfully propagated and produced callus, shoots, and roots. Kingfisher was grafted to Syrah and planted into a rootstock trial at UCKREC, Parlier, California in 2005.

When four years of fruiting data and three years of pruning weight data are considered, Kingfisher rootstock showed a fruit to pruning weight ratio of 6.53. The check rootstock, Freedom, showed a fruit to pruning weight

(Continued on page 8)

Gopher Control Methods

(Continued from page 1)

Gophers also gnaw and damage plastic water lines and lawn sprinkler systems. Their tunnels can divert and carry off irrigation water, which leads to soil erosion.

Habitat modification
Involves altering habitat to reduce desirability for gophers.

Example includes removing preferred foods (i.e., clover, nutsedge) of gophers.

Biocontrol
Relies on natural predators (e.g., owls, snakes) to control gophers.

Not very effective.

Repellents and frightening devices
Relies on methods to deter gophers from causing damage.

Examples: chemical repellents and sonic stakes; do not appear to work.

Baiting
Poison baits fall into two categories: anticoagulants and acute toxins.

Anticoagulants (e.g., diphacinone, chlorophacinone) require multiple feedings.

Acute toxins (e.g., zinc phosphide, strychnine) often are restricted-use materials.

Can be effective for pocket gophers.

Read labels for application instruction.

Burrow builder can also be used to treat large areas for gophers although efficacy appears to vary.

Fumigation
Involves use of poison gas in burrow to control gophers.

Examples include aluminum phosphide (restricted-use material) and gas cartridges.

Gas cartridges not effective for pocket gophers.

Aluminum phosphide very effective for pocket gophers.

Use of carbon monoxide (e.g., vehicular exhaust) is not legal for use in California.

Figure 1. Pocket gopher tunneling and producing a mound.

Gas explosive device
Involves combustion of propane and oxygen in burrow system to dispatch gophers through concussive force; also destroys burrow system.

May not be overly effective.

Has potential hazards including injury to user, destruction of underground pipes, and causing fires. Also very loud, so not appropriate in residential areas.

Trapping
Involves lethal control through physical capture.

Many kinds of traps available with varying degrees of effectiveness.

Has many positive qualities including knowledge that you killed the target animal, no use of toxic chemicals, available for use in organic setting, and can be efficient and economical once user becomes proficient at trapping.

Gopher Trapping Protocol
Step 1: Locate freshest mounding activity. Key is to look for mounds that contain moist dirt. If you are unsure how to detect fresh mounds, you can knock down old mounds 1–2 days before trapping. Then all new mounds should be fresh and active. If following rain or irrigation, it is best to wait 1–2 days before trapping. Gophers are relatively inactive immediately following watering events. However 1–2 days after these watering events, gophers are typically very active

(Continued on page 6)

(Continued from page 1)

treatment were pruned to six 15-node canes per vine. Any woody laterals shoots were removed from the canes at pruning. After pruning, all the canes from the center vine in each subplot, considered the "data vines", were measured, the number of primary nodes recorded, and the number of primary nodes per unit cane length were calculated. Then the canes were tied on the trellis wires.

In spring, when the shoots were approximately 15 cm long, shoot emergence and the number of clusters on each shoot was determined for each node position on the canes of every data vine. In mid-August, three canes were selected at random from each data vine, and clusters of fruit were recounted, harvested, and weighed individually from each node position. Then, a sub sample of 30 berries was randomly collected from each cluster. The sample was weighed, and average berry weight determined. The number of berries per cluster was estimated by dividing the cluster weight by the average berry weight. Next, the sub sample was crushed in a blender, the juice filtered, and soluble solids determined with a digital refractometer. Shoot emergence, the number of clusters per node, cluster weight, berry weight, and soluble solids were plotted.

Internode length varied among varieties; 'DOVine' and 'Thompson Seedless' had approximately 4.25 nodes per foot of cane, whereas Fiesta had 3.9 nodes per foot, and Selma Pete, which had the longest internodes, had only about 3.5 nodes per foot. Thus 15-node canes of 'Fiesta' and 'Selma Pete' may be 10 to 20% longer than 15-node canes of 'Thompson Seedless' or 'DOVine'. If differences in internode lengths are consistently observed in future seasons, pruners should be made aware of the varietal characteristics to ensure they are leaving the desired number of nodes on each cane.

Shoot emergence from the first five to ten basal nodes was relatively low for all varieties as Christensen observed for Thompson Seedless (1986), though shoot emergence was slightly greater at most positions on 15-node canes than on 20-node canes (Figures 1-4). Cane length also appears to have somewhat affected cluster characteristics but, at this point, effects of node position appear to be stronger than effects of cane length, so data from different cane lengths are shown together in this preliminary report. The number of clusters per node generally increased from nearly zero clusters, at the most basal node, to a peak of between 1 and 1.5 clusters at nodes eight through twelve, before leveling off, or declining slightly, toward the end of the 20-node canes (Figure 5). The paucity of clusters from basal nodes is due, at least partly, to lower shoot emergence, whereas the slight decline in the number of clusters at apical nodes is due to lower fruitfulness. Fiesta was an exception in that it generally produced more clusters per node than the other

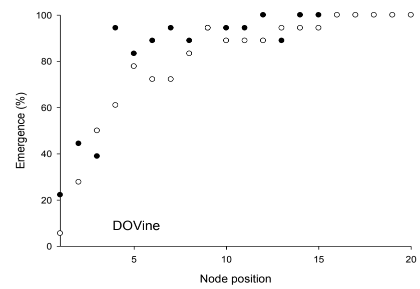


Figure 1. Average shoot emergence from nodes on 'DOVine' grapevine canes with 15 (black circles) or 20 (white circles) nodes per cane. Node position 1 is the most basal node. Each point is the average of 18 observations per node.

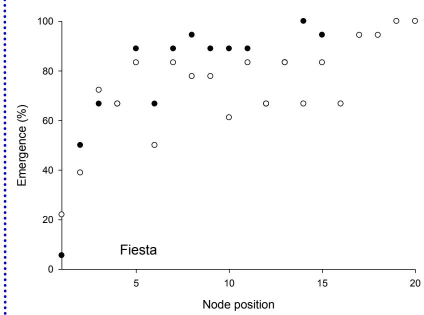


Figure 2. Average shoot emergence from nodes on 'Fiesta' grapevine canes with 15 (black circles) or 20 (white circles) nodes per cane. Node position 1 is the most basal node. Each point is the average of 18 observations per node.

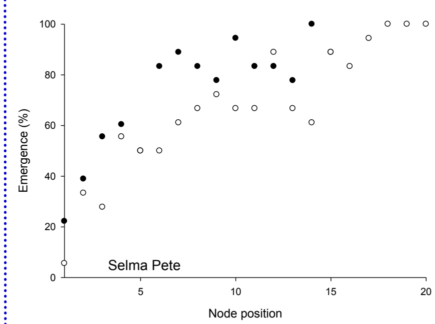


Figure 3. Average shoot emergence from nodes on 'Selma Pete' grapevine canes with 15 (black circles) or 20 (white circles) nodes per cane. Node position 1 is the most basal node. Each point is the average of 18 observations per node.

(Continued on page 5)

Raisin Cultivars

(*Continued from Page 4)*

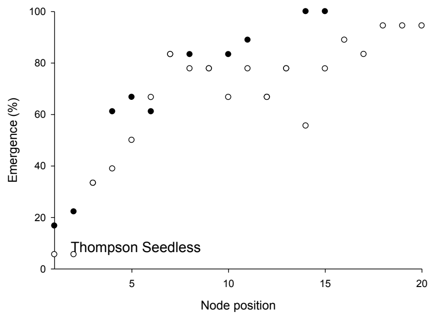


Figure 4. Average shoot emergence from nodes on 'Thompson Seedless' grapevine canes with 15 (black circles) or 20 (white circles) nodes per cane. Node position 1 is the most basal node. Each point is the average of 18 observations per node.

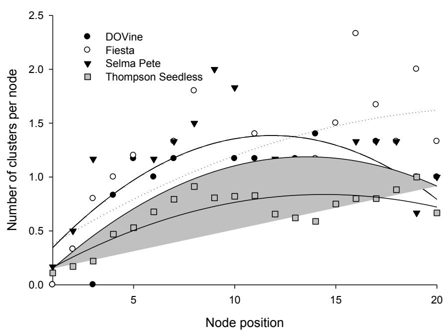


Figure 5. The average number of clusters per node at positions along the length of 'DOVine', 'Fiesta', 'Selma Pete', or 'Thompson Seedless' grapevine canes. Each data point is the average of 36 (nodes 1 through 15) or 18 (nodes 16 through 20) observations.

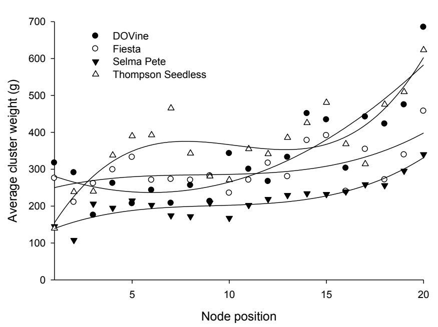


Figure 6. The average cluster weight per node at positions along the length of 'DOVine', 'Fiesta', 'Selma Pete', or 'Thompson Seedless' grapevine canes. Each data point is the average of 36 (nodes 1 through 15) or 18 (nodes 16 through 20) observations.

varieties, and the number of nodes per cluster continued to increase throughout the length of the cane.

Average cluster weight generally increased with each of the first five or six nodes, and then remained about the same until node fifteen, after which average cluster weights increased again, except for DOVine which had relatively large clusters at the first few nodes (Figure 6). Berry weights from clusters at each node were generally similar (data not shown), so variations in cluster weights were mostly due to differences in the number of berries per cluster. Soluble solids were inversely correlated with node position (Figure 7), but the mass of soluble solids (cluster fresh weight x soluble solids) per node generally increased with node position because cluster weight increased at a greater rate than soluble solids decreased. These data are also in agreement with data from Christensen (1986) who showed that cluster weight increased by approximately 40% from nodes 3 through 11, whereas soluble solids only decreased about 15%. To better understand what these

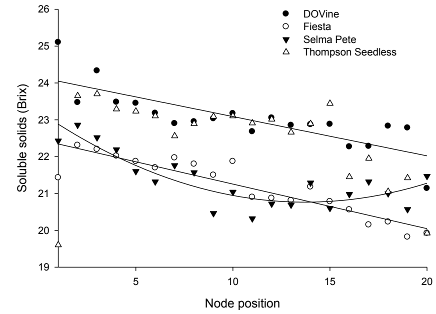


Figure 7. The soluble solids of grapes from clusters produced from shoots of nodes at each position along the length of 'DOVine', 'Fiesta', 'Selma Pete', or 'Thompson Seedless' grapevine canes. Each data point is the average of 36 (nodes 1 through 15) or 18 (nodes 16 through 20) observations.

findings may mean for raisin yield and quality, we have initiated a study comparing vines having similar numbers of nodes on either long or short canes. These data will help us develop pruning guidelines that minimize labor and optimize productivity.

Matthew Fidelibus is the UC Cooperative Extension Viticulture Specialist based at UC Kearney Ag Center, Parlier CA.

Gopher Control Methods

(Continued from Page 3)

and fresh mounds are easy to discern.

Step 2: Use probe to find gopher tunnels (Fig. 1). Start by finding the plug of the mound and then start probing anywhere from 4–12 inches behind this plug. You will know you have found the tunnel when you feel a drop in the probe (i.e., less resistance) of a couple of inches. Tunnels are usually 6–12 inches below the surface, though they will occasionally be deeper. Finding tunnels takes patience and skill. Practice will eventually yield much quicker tunnel detection.

Step 3: Dig down to tunnel. Clear out tunnel until opening is just big enough to insert trap.

Step 4: Set traps and place into tunnels (Fig. 2). Push traps back until the entire trap is within the tunnel. Stake traps down (wire flags work great) so the gopher or predator does not run off with the trap. These stakes can also serve as markers to indicate where you set the trap.

Step 5 (optional): Cover trap-hole up with sod, plywood, canvas, or some other material to keep light from entering tunnel system. However, recent research has shown that this step is not necessary in most cases, and in fact, leaving trap-holes uncovered can save much time when setting and checking many traps.

Step 6: Check traps 24–48 hours later. If no activity, move to new tunnel system.

Figure 2. Young grapevine trunk girdled by gophers will display scorched leaves when weather warms.

Warning on the Use of Chemicals

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock. Consult the pesticide label to determine active ingredients and signal words.

Additional information

UC IPM gopher management: http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html

Roger A. Baldwin, is a University of California IPM Wildlife Pest Management Advisor based at the UC Kearney Ag Center in Parlier CA.

Current Wine and Wine Grape Research

This is an opportunity to hear and discuss the latest research directly from researchers. Topics include: grapevine breeding and evaluation, cultural practices, disease and insect pest control, and enology. The format of 20-minute reports allows for synopses of many projects in a single day. Each scientist will have 15 minutes to speak and an additional five minutes to answer questions from the audience.

Date: February 14, 2012

Time: 9:00 AM - 5:30 PM

Speakers: UC Davis Extension

Location: Freeborn Hall, UC Davis

Fee: $49.00 Includes lunch, wine reception that starts at 4:20 p.m., and course materials.
http://extension.ucdavis.edu/index.asp

USDA: New Plant Hardiness Zone Map

Kim Kaplan

The U.S. Department of Agriculture (USDA) today released the new version of its Plant Hardiness Zone Map (PHZM), updating a useful tool for growers and researchers for the first time since 1990 with greater accuracy and detail. The new map—jointly developed by USDA's Agricultural Research Service (ARS) and Oregon State University's (OSU) PRISM Climate Group—is available online at :

www.planthardiness.ars.usda.gov

For the first time, the new map offers a Geographic Information System (GIS)-based interactive format and is specifically designed to be Internet-friendly. The map website also incorporates a "find your zone by ZIP code" function. Static images of national, regional and state maps also have been included to ensure the map is readily accessible to those who lack broadband Internet access.

"This is the most sophisticated Plant Hardiness Zone Map yet for the United States," said Catherine Woteki, USDA Under Secretary for Research, Education and Economics. "The increases in accuracy and detail that this map represents will be extremely useful for growers and researchers."

Plant hardiness zone designations represent the average annual extreme minimum temperatures at a given location during a particular time period. They do not reflect the coldest it has ever been or ever will be at a specific location, but simply the average lowest winter temperature for the location over a specified time. Low temperature during the winter is a crucial factor in the survival of plants at specific locations.

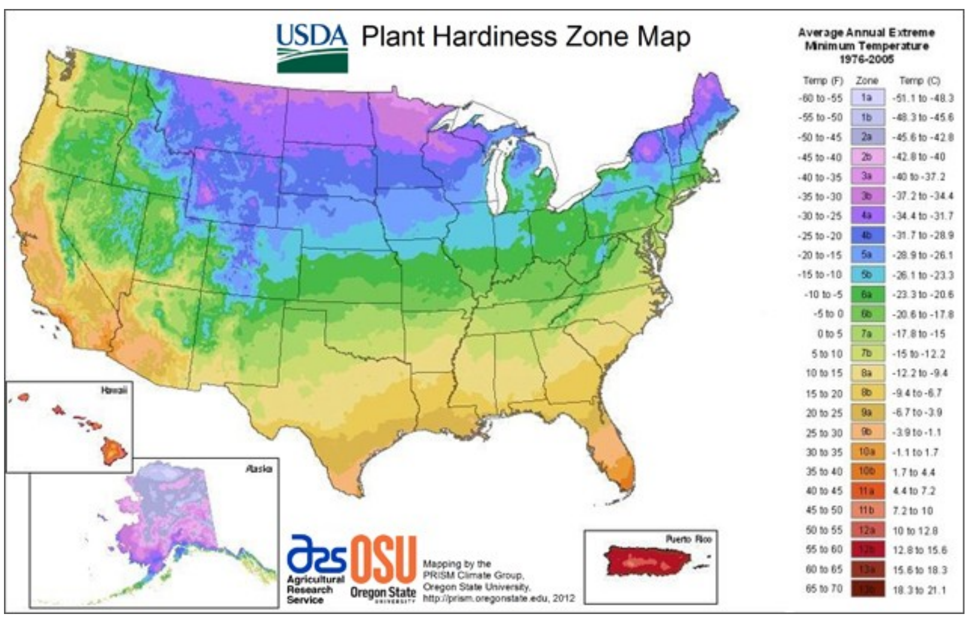
The new version of the map includes 13 zones, with the addition for the first time of zones 12 (50-60 degrees Fahrenheit) and 13 (60-70 degrees Fahrenheit). Each zone is a 10-degree Fahrenheit band, further divided into 5-degree Fahrenheit zones "A" and "B."

To help develop the new map, USDA and OSU requested that horticultural and climatic experts review the zones in their geographic area, and trial versions of the new map were revised based on their expert input.

Compared to the 1990 version, zone boundaries in this edition of the map have shifted in many areas. The new map is generally one 5-degree Fahrenheit half-zone warmer than the previous map throughout much of the United States. This is mostly a result of using temperature data from a longer and more recent time period; the new map uses data measured at weather stations during the 30-year period 1976-2005. In contrast, the 1990 map was based on temperature data from only a 13-year period of 1974-1986.

However, some of the changes in the zones are a result of new, more sophisticated methods for mapping zones between weather stations. These include algorithms that considered for the

(Continued on page 8)



Although a poster-sized version of this map will not be available for purchase from the government as in the past, anyone may download the map free of charge from the Internet onto their personal computer and print copies of the map as needed.

Rootstocks

(Continued from page 2)

ratio of 6.14, demonstrating the improved production efficiency of Kingfisher rootstock compared to Freedom.

Minotaur, Matador, and Kingfisher rootstocks were bred by USDA-ARS as a part of a research project that received grant funding from the American Vineyard Foundation, California Table Grape Commission, California Raisin Marketing Board, California Grape Rootstock Improvement Commission, and California Grape Rootstock Research Foundation in addition to appropriated funds. These three rootstocks were released as public varieties, with no intellectual property protection.

Peter Cousins, Grape Rootstock Breeder and Geneticist, USDA ARS Grape Genetics Research Unit, Geneva, New York. Original article in FPS Newsletter 2011.

Zone Map

(Continued from page 7)

first time such factors as changes in elevation, nearness to large bodies of water, and position on the terrain, such as valley bottoms and ridge tops. Also, the new map used temperature data from many more stations than did the 1990 map. These advances greatly improved the accuracy and detail of the map, especially in mountainous regions of the western United States. In some cases, they resulted in changes to cooler, rather than warmer, zones.

While about 80 million American gardeners, as well as those who grow and breed plants, are the largest users of the USDA Plant Hardiness Zone Map, many others need this hardiness zone information. For example, the USDA Risk Management Agency uses the USDA plant hardiness zone designations to set some crop insurance standards. Scientists use the plant hardiness zones as a data layer in many research models such as modeling the spread of exotic weeds and insects.

Kim Kaplan is with ARS News Service, Information Staff, Agricultural Research Service located in Beltsville MD.

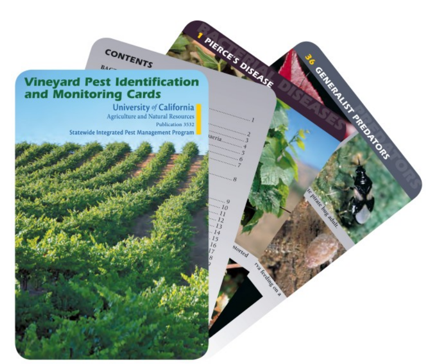
Vineyard Pest ID Cards

Keep your vineyard healthy by staying on top of pest activity with this pack of 50 sturdy, pocket-size laminated cards that will help growers, vineyard managers, and their teams identify and manage most common problems. This is the perfect quick reference to identifying and monitoring vineyard diseases and pests.

The Pest ID cards cover 27 common insects and mites, 8 diseases, 6 beneficial insects, and a variety of other disorders, weeds, and invertebrate pests. Each pest is identified by a description and excellent close-up color photographs—244 photos in all. On the reverse of each card is a description of the various life stages and monitoring tips.

Also includes descriptions of natural enemies as well as handy inch and metric measurement scales. A sturdy rivet keeps the set together so individual cards don't stray.

Publication Number: 3532
Author: LUCIA G. VARELA, WALT J. BENTLEY
$25.00 / EACH + Tax & Shipping



CALENDAR OF EVENTS

Local Meetings and Events

60th Annual Lodi Grape Day
February 7, 2012
7:30 a.m.— 12:30 p.m.
Hutchins Street Square
125 South Hutchins Street
Lodi, CA 95240

Grape Day Announcement

U.C. Davis University Extension Meetings
(800) 752-0881

Introduction to Wine Analysis
March 10, 2012
9:00 a.m. — 6:00 p.m.
1127 North, Robert Mondavi Institute
for Wine and Food, Old Davis Rd.
Davis, CA
Section: 113VIT208

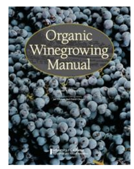
Introduction to Wine Microbiology
March 28, 2012
9:00 a.m.— 4:00 p.m.
Da Vinci Building
1632 Da Vinci Ct.
Davis, CA
Section: 113VIT210

Introduction to Winery Sanitation
March 29, 2012
9:00 a.m.— 4:00 p.m.
1127 North, Robert Mondavi Institute
for Wine and Food, Old Davis Rd.
Davis, CA
Section: 113VIT211

Publications from the University of California

Vineyard Pest Identification and Monitoring Cards
ANR Publication 3532
Price - $25.00 + tax and shipping

Keep your vineyard healthy by staying on top of pest activity with this pack of 50 sturdy, pocket-size laminated cards. This is the perfect quick reference to identifying and monitoring vineyard diseases and pests. Twenty-seven common insects and mites, 8 diseases, 6 beneficial insects, and a variety of other disorders, weeds, and invertebrate pests are covered in 244 photos.
These 50 information-rich cards will help growers, vineyard managers, and their teams identify and manage most common problems.



NEW! Organic Winegrowing Manual
ANR Publication 3511
Price — $35.00 + tax and shipping

Interest in California organic wine grape production inspired this publication that provides a full-color guide with information on soil management, including soil considerations when selecting a vineyard site, developing organic soil and fertility programs and selecting cover crops. An extensive section covering weed, disease, insect, mite, and vertebrate pest management options for organic grape production is covered. The chapter on organic certification contains an overview of considerations for evaluating and selecting a certifier.

Order Form

Publication	Qty.	Price	Subtotal
Vineyard Pest Identification		$ 25.00	
Organic Winegrowing Manual		$ 35.00	

Shipping – USA Only

Merchandise Total	Shipping Charge
$1—29.99	$6
$30—39.99	$8
$40—49.99	$9
$50—79.99	$10
$80—99.99	$12
$100+	$15

Merchandise Total:	
Tax = 7.975%:	
Shipping Based on Merchandise Total:	
Total Enclosed:	$

Checks Payable to UC Regents

Name ______________________________

Address ____________________________

City _______________________________

State, Zip Code______________________

Phone (   )_________________________

Send to:
UC Regents - Cooperative Extension
1720 S. Maple Avenue
Fresno, CA 93702

UNIVERSITY OF CALIFORNIA
COOPERATIVE EXTENSION
County of Fresno
1720 South Maple Avenue
Fresno, CA 93702

RETURN SERVICE REQUESTED

Vine Lines

Produced by UC Cooperative Extension Farm Advisor Stephen J. Vasquez. Contact me for further article information, or to be added to the mailing list.

1720 South Maple Ave.
Fresno, CA 93702
Hours: 8:00—5:00 M-F

(559) 600 -7285

Visit us online at
http://cefresno.ucdavis.edu

In This Issue