University of California Cooperative Extension Fresno County

Vine Lines

Stephen J. Vasquez, Viticulture Farm Advisor

August 2009 Issue

An Assessment of Multiple Approaches for Controlling Gophers in Vineyards

Roger A. Baldwin

Pocket gophers cause extensive damage to many crops including grapes. Many tools are available for controlling gophers including trapping, fumigation with aluminum phosphide, poison baits, and the use of a gas explosive device. Trapping gophers has been a common method for controlling gophers for many years. However, a new trap called the Gophinator (Trapline Products, Menlo Park, CA) is now available that may increase efficiency of trapping. Additionally, combining aluminum phosphide fumigation with trapping may increase effectiveness, as gophers will occasionally spring traps without getting captured. In these situations, gophers often become trap shy and are much more difficult to capture.

Treating these tunnel systems with aluminum phosphide shortly after trapping could remove these individuals from the population thereby increasing gopher control in vineyards. Poison baiting with strychnine, zinc phosphide, and anticoagulant baits (e.g., chlorophacinone and diphacinone) has often been used to control gophers. Efficacy of these treatments has varied widely, although strychnine baits reportedly are most effective. Gas explosive devices have been used to control a number of burrowing animals, although no scientific studies on gophers have been reported. These devices combust a mixture of propane and oxygen within tunnel systems, thereby killing gophers through concussive force while also destroying the burrow system.

All of these methods are currently allowable techniques for controlling gophers in California, although the efficacy and efficiency of these approaches, particularly in comparison to one another, remain unclear.

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Evaluation of Movento™ (spirotetramat) for efficacy against nematodes infesting perennial crops

Michael McKenry, Stephanie Kaku and Tom Buzo

Movento™ (spirotetramat) is a novel active ingredient from the new chemical class of tetramic acids. When applied to foliage, this highly systemic insecticide is converted into an enol form and translocated in an acropetal and basipetal manner within the plant, resulting in effective pest control on roots and shoots. Three years of field evaluations have shown up to a 70% reduction in population levels of *Xiphinema americanum* collected from *Vitis* spp using sieve/mist extraction procedures 18 days after treatment (Fig. 1). Soil extractions of *Xiphinema index* involved a sieve/cheesecloth procedure with impact detectable at 18 days but population declines undetectable until 36 days after treatment. Soil extractions for *Mesocriconema xenoplax* involved sieve/centrifugation methodology, a procedure that provided no indication of reduced population levels until 54 days after treatment (Fig. 2). It is apparent that nematode extraction procedures that necessitate nematode motility are the quickest to show nematicidal impact associated with spirotetramat. Work conducted to date has shown varying degrees of impact with spirotetramat against all plant parasitic

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To better address these issues, I established a replicated trial at Laguna Ranch, Sebastopol, CA, from 6 April – 8 May, 2009, to estimate the efficacy and efficiency of these approaches. Three study blocks were established ranging from 21–31 acres in size. Plots of all three treatment types and a control were established within each block. To assess the impact of treatments on gophers, populations first were indexed by counting fresh gopher mounds and feeder holes in 14–20 index plots per treatment block. This provided both an absolute (presence or absence) and relative (number of mounds and feeder holes) index of activity. Following initial indexing, all treatments were applied. For trapping + baiting, plots were first trapped using Gophinator traps. If a gopher triggered or plugged a trap without getting captured, this tunnel system was flagged. The next day, these flagged tunnel systems were treated with aluminum phosphide (Phostoxin, D & D Holdings, Inc., Weyers Cave, VA). Baiting treatments involved the use of a self-dispensing probe and 1.8% strychnine-treated milo baits (Gopher Getter Restricted Use Bait, Wilco Distributors, Inc., Lompoc, CA). The label directed rate of bait was applied twice per burrow system. The Rodenator® (Meyer Industries, Midvale, ID) was used to treat all gas explosive plots. Following all treatments, new gopher activity was again assessed. This provided an index of gopher control. A second round of treatments was then applied in the same manner as the first round of treatments. A final index of gopher activity was recorded following these final treatments.

In addition to efficacy, I was also interested in assessing how much time and cost was required for each treatment method. Therefore, I recorded average time to apply each treatment, as well as the amount of labor required for each treatment block. The amount of labor was then combined with material costs to estimate the cost of each treatment type. These costs were compared to efficacy to determine which treatment type appeared to be most reasonable for controlling gophers in a vineyard setting.

Based on absolute indices, Rodenator® control ranged from 0–55%, baiting control ranged from 30–56%, and trapping + fumigation ranged from 74–90% (Fig. 1). Relative index values mirrored absolute indices, with substantial reductions in gopher sign for all trapping + fumigation plots (range = 91–96%; Fig. 2); only 2 of 3 baiting (range = 22–81%) and Rodenator® (range = 0–86%) plots indicated substantially reduced gopher sign (Fig. 2). Index values did not differ for control plots for either absolute or relative indices (Figs. 1 and 2). Therefore, observed differences within and across treatments did not appear to be an artifact of natural variation in gopher populations over the sampling period.

The time required to apply each treatment was relatively similar between baiting, trapping, and Rodenator® treatments (90–106 seconds); fumigation treatments were substantially longer (260 seconds). Total costs for each treatment were $7,568, $6,338, and $4,532 for baiting, Rodenator®, and trapping + fumigation, respectively. To be effective, control measures need to result in a minimum of a 70% reduction in plots with gopher activity; values of 80–90% are preferable. Trapping + fumigation met this minimum criterion in all three plots, and met the more rigorous criterion in 2 of 3 plots. Even the one plot that fell short of an 80% reduction in plots with gopher activity yielded a 92% reduction in overall gopher activity. In addition to being more efficacious, trapping + fumigation was also more cost effective. Therefore, trapping + fumigation appears to be an effective method for controlling gophers. Baiting and Rodenator® treatments did somewhat reduce gopher activity in most plots, but these levels of control fell well below the minimum threshold for effectiveness (70%). As such, growers may realize short-term benefits from control, but will have to apply equal effort for control the following year. More effective control measures (80–90%) should reduce the cost of control in subsequent years. Although absolute values were lower than desired for baiting and Rodenator® treatments, relative index values indicated a

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Women in Wine

Elisabeth Kauffman

Women winemakers trained at UC Davis helped shatter the glass ceiling in the industry, paving the way for a new crop of female-run wineries that are family friendly and green.

For thousands of years, the wine industry was dominated by men. The few women who worked in wine did so more by chance than by choice. In France, during the 18th and 19th centuries, Veuve Cliquot and later Madame Pommery, also known as the "champagne widows," both inherited wineries after their husbands' deaths. These women revolutionized the industry.

Cliquot is credited by some historians with developing an aging technique called riddling, which is still used today in champagne production to improve the clarity and quality of the wine.

Madame Pommery developed the driest and most popular forms of champagne — brut and extra brut — to appeal to English tastes and tap new overseas markets. In the process she transformed her small business into a world-renowned champagne house.

But as businesswomen and pioneers, they remained the exception to the rule — until now.

It's a much different story today. By virtue of their passion, drive and diverse approaches to the business of winemaking, women have emerged as a defining force in California wine. And for many women in the wine industry today, a UC Davis education has been the key to their success.

"No center of higher learning related to wine has been more important for women than the Department of Viticulture and Enology at the University of California at Davis," says Ann Matasar in her 2006 book Women of Wine, which looks at the contributions women have made to the industry throughout history.

The department was established in 1935, two years after the repeal of Prohibition. For 30 years, the grape growing and winemaking programs remained male domains.

In 1965, Mary Ann Graf became the first woman to graduate from the viticulture and enology department at UC Davis (majoring in fermentation science). When asked about this achievement now, she says, "It wasn't that big a deal. In those days I thought that a college education was the key to getting a good job."

The reality is that Graf, by blazing her own trail into the world of wine, left a path for other women to follow. By the early 1990s, nearly 50 percent of UC Davis's viticulture and enology graduates were women. In the same way, Matasar says, UC Davis made it respectable for similar institutions elsewhere to follow its example of fostering women as leaders in the field. The Geisenheim State Research Institute in Germany, for example, hired Monika Christmann as head of its enology department in 1993, three years after UC Davis' program named geneticist Linda Bisson as its first woman chair.

Today, there are many exceptional women in the business. The Wine Institute notes that about 15–20 percent of winemakers in California are women.

In the current market, their gender may give them an edge.

According to the Wine Institute, women purchase 57 percent of the wine consumed in the United States. For women, label design, bottle shape, and the winery philosophy rank just as high as wine quality, so wine industry marketing professionals have had to develop more savvy in their appeal to the female consumer.

Sonoma County winemaker Merry Edwards, M.S. '73, finds that "women tasters are less inhibited in talking about wine and relating it to food, where men tend to get hung up on saying the right thing, using the right language." And many female vintners are succeeding in creating and promoting wines that appeal widely to other women.

Of course, it hasn't always been that way. Even with the power of knowledge and the passion of artistry behind them, some of the early female pioneers in the California industry found it hard to get a foot in the cellar door.

Edwards said she encountered gender discrimination repeatedly while pursuing a winemaking career.

"After gaining valuable experience at my first job, I still came up against the same discrimination I had encountered before I gained all that experience," says Edwards. She found that the perception of

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substantial reduction in gopher activity for 2 of 3 plots for both baiting (blocks 12 and 13) and Rodenator® (blocks 13 and 16) treatments (Fig. 2). Therefore, an additional round of treatments could have resulted in greater absolute control values, although additional treatments would add additional costs to control efforts. This is of note, as baiting, and in particular, Rodenator®, treatments have the potential for slowing reinvasion rates due to the destruction of gopher burrow systems by the Rodenator®, and due to residual bait remaining in vacated gopher tunnel systems. However, given that these treatment types were already more costly than trapping + fumigation, a relatively high reduction in reinvasion rates would be required to offset these costs. These reinvasion rates are starting to be assessed. Initial results have hinted that Rodenator® treatments may in fact be reducing gopher populations several months post-treatment, although several more sampling periods will be required to determine if this is in fact the case.

Gophers are a problem for many growers throughout California. As such, effective control options are needed. Trapping can be an effective and efficient method for controlling gophers.

Currently, I am working on a trapping study with several other Farm Advisors throughout California comparing different trap types and trapping strategies. We are currently looking for additional vineyard sites to test these traps and trapping strategies in the fall. If you have a vineyard with a high gopher population and are interested in cooperating with us in this study, please contact me (559-646-6583; rbaldwin@uckac.edu) or Stephen Vasquez (559-456-7285; sjvasquez@ucdavis.edu).

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Roger A. Baldwin is a UC Wildlife Pest Management Advisor located at Kearney Agricultural Center, Parlier, CA.

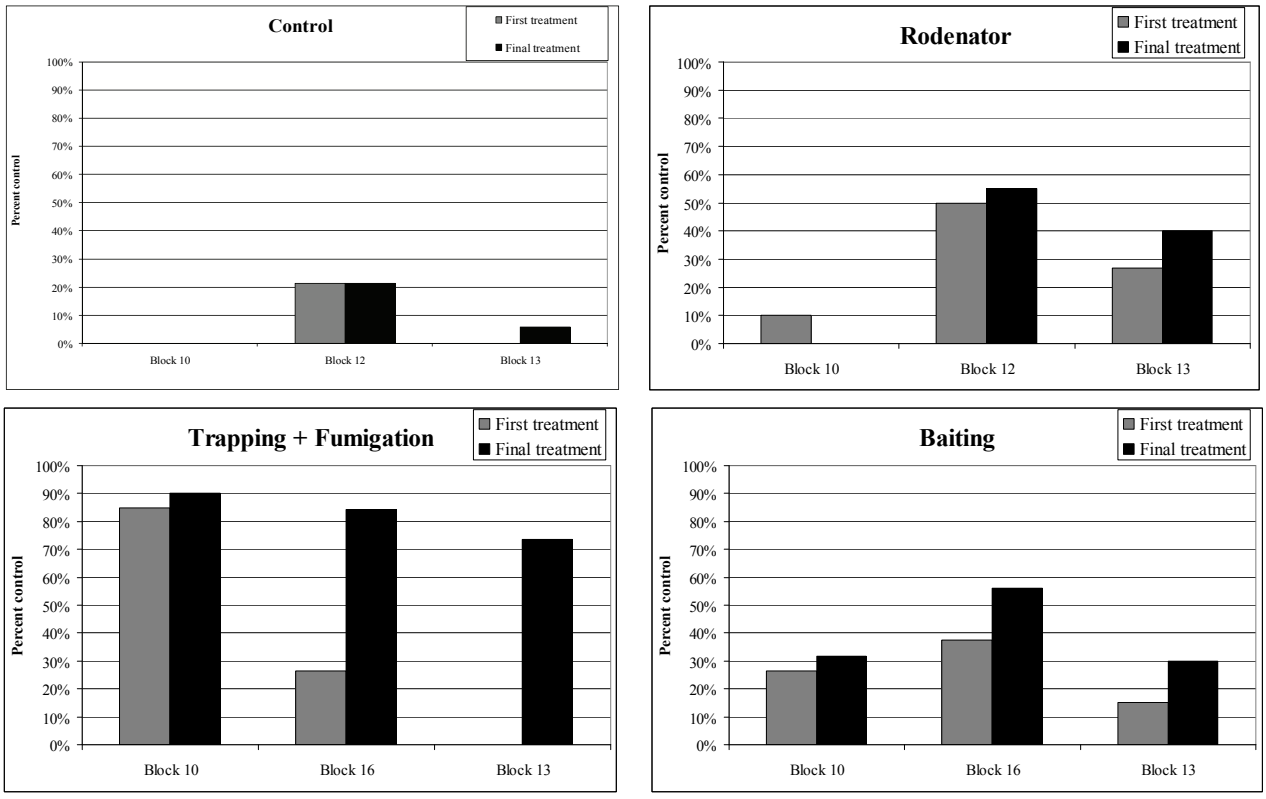

Figure 1. Comparison of percent control ([number of sampling plots with gopher activity after treatment / number of sampling plots with gopher activity before treatment] x 100) across three treatment blocks after the application of the first and final treatment for control, Rodenator, trapping + fumigation, and baiting treatments.

Evaluation of Movento™

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nematode species have been reduced by 50% for up to three months, provided that irrigation was delayed for two weeks following treatment. Late fall treatments to *Juglans* spp. reduced population levels of *Pratylenchus vulnus* by 45% for 4 months, whereas populations of *Tylenchulus semipenetrans* infecting *Vitis* spp were reduced for only 6 weeks. Spring treatments involving *Meloidogyne* spp, as well as those listed above, have provided 50% population reductions for 3 months (Fig. 3). Infection percentages of *T. semipenetrans* by an un-described *Pasteuria* species were not impacted after three years of spirotetramat applications. First-year yield improvements of 10% from treated vines were common but seldom significant. One data set involving a 2-year test provided significantly improved yield as a result of treatment. Phloem transport of molecules having relatively subtle effects on nematodes will require a greater understanding of application timing relative to nematode development, as well as environmental and prevailing field conditions (Fig. 4). Currently, spring/fall treatment timings are associated with avoidance of post-treatment irrigations rather than toward date of root flush.

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Controlling Gophers in Vineyards

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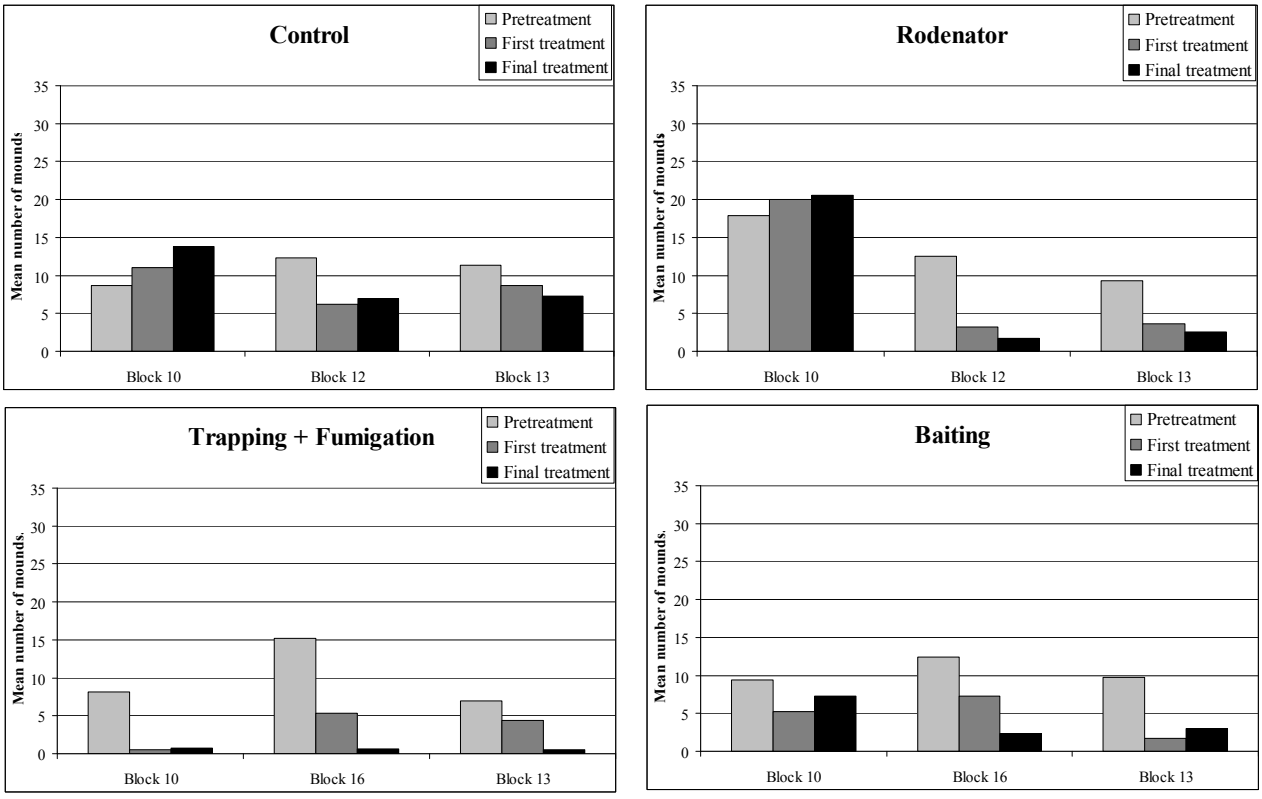

Figure 2. Comparison of the mean number of gopher mounds for three treatment blocks before treatment (pretreatment), after the first treatment, and after the final treatment for control, Rodenator, trapping + fumigation, and baiting plots.

Women in Wine

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women as the weaker sex worked against her, even when she had proved she could handle the physical aspects of the job. After making wines for a number of vintners, she now has her own label and pinot noir vineyards. In 2007, she opened Merry Edwards Winery in Sebastopol.

Zelma Long, who co-owns Long Vineyards in Napa Valley and also produces wine in Germany and South Africa under the Zelphi label, says she was less affected by gender discrimination. "My first 10 years in the industry, things were moving so fast that there wasn't time to notice if there was any resistance to my being a woman." In fact, she believes that being a woman was an advantage early on because she stood out in a crowd. After attending the master's program in enology at UC Davis in 1970, Long began her career by interning with Robert Mondavi Winery. She loved the work so much that she has never looked back, going on to establish herself as a talented winemaker and mentor of other talented women in the industry. Among them was UC Davis alumna Diane Kenworthy '86, a Sonoma County vineyard manager who in 1997–98 served as the first woman president of the American Society of Enology and Viticulture.

Women continue to create names for themselves in the industry by striking the right combination of premium products and well-targeted marketing. Bisson says that, with time, even more women may be attracted to careers in the wine industry for its variety of roles — from viticulture to winemaking to marketing — and with its flexible hours during most of the year for family life. "It is fair to say that the glass ceiling has been smashed."

Even Edwards notes that when she was working for Matanzas Creek Winery in Sonoma County, her bosses provided a nanny so that she could bring her son to work with her during the busiest parts of the year.

Today, at her own winery, she strives to maintain a family atmosphere even during harvest. "Every day we feed everybody a healthy lunch," she says. "It keeps everybody together and keeps the energy focused on the winemaking."

A new generation of female winemakers is also leading the movement to go green.

Edwards' winery, located at Coopersmith vineyard in the Russian River Valley, runs largely on solar power. "The benefits far outweigh the cost," she says. "There are a lot of good things happening with the green movement. I'm really happy to be involved."

Sarah Cahn Bennett's family winery, Navarro Vineyards in Mendocino County, is finding innovative ways to stay sustainable too — keeping a flock of miniature babydoll sheep to control vineyard weeds. The woolly vineyard workers, too short to damage the vines, reduce energy consumption.

Bennett, M.S. '06, said she likes the complexity of her work as an enologist. "Good winemakers combine cerebral and physical skills. The wine industry is fun as well as challenging. It requires you to be a jack of all trades. Just when you get bored with one job, there is another completely different project to get involved with."

In helping to run the winery, Bennett applies her business skills — a critical part of the job. The UC Davis Graduate School of Management now offers a week-long program for wine executives. Participation by women has risen from 20 percent to 31 percent of attendees over the last eight years.

Alison Crowe, an award-winning Napa winemaker and wine columnist who earned her bachelor's degree in fermentation science and Spanish at UC Davis in 1999, participated in the GSM program in 2007, and taught a segment of the program in 2008 and 2009. "A solid foundation in business and management is fundamental to the success of wineries," Crowe says. "The wine executives program provides perspective of the many facets of the wine business. Learning how each individual role adds value to the whole product helps foster a more supportive atmosphere in each winery."

Crowe is now pursuing a UC Davis Master of Business Administration while working full time as a winemaker for Plata Wine Partners in Napa.

There are still relatively few women in top corporate positions in the wine industry, but increasing numbers of women own and operate small wineries.

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Evaluation of Movento™

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This strategy will change depending on the crop (Fig. 5) and method of irrigation. Two well-timed treatments per year provide a starting point toward better understanding of the pest management complexities when multiple target pests are involved.

Michael McKenry is a UC Cooperative Extension Nematologist at UC Riverside and is based at UC Kearney Ag Center.

Stephanie Kaku and Tom Buzo are UC Staff Research Associates at UC Kearny Ag Center.

Fig. 1 By 2008 *X. americanum* /250 cc soil as compared to untreated

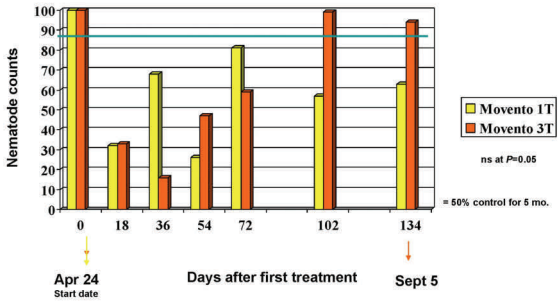


Fig. 2 Control of ring nematode, as compared to untreated at Orosi-West

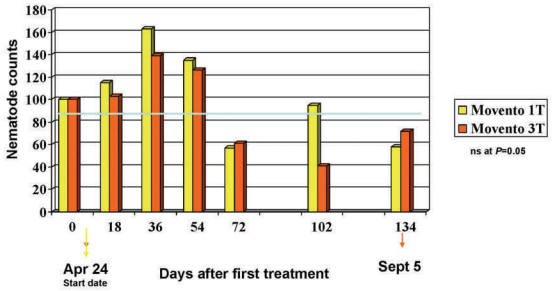


Fig. 3 Control of root-knot nematodes in young roots 72 days after first-treatment at Orosi-East

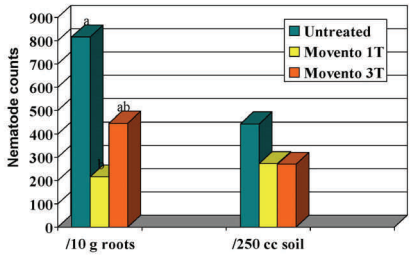


Fig. 4 Control of citrus nematode at or between drip emitters at 99 days after first Movento treatment

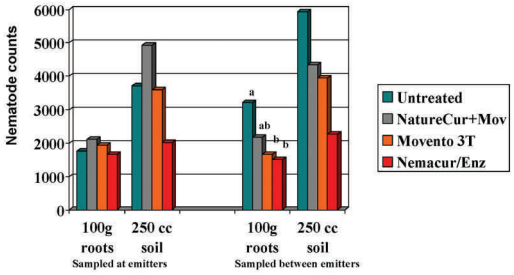
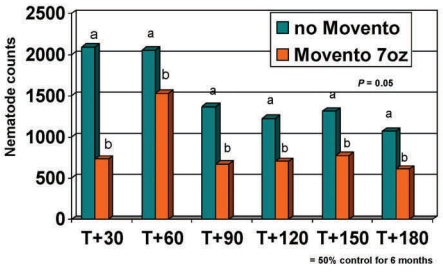


Fig. 5 *P.vulnus* /250 cc in surface 18" of walnut rhizosphere soil



Women in Wine

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Boutique labels like Merry Edwards Wines and La Sirena (Heidi Peterson Barrett '80) have become popular in recent years with consumers and wine critics. Smaller wineries, able to sell directly to consumers, are thriving, even as large wineries flood the market and mid-sized wineries get bought up by larger corporations.

"There are many more women in the business now than in the generation before," Bennett says. "There is nothing in the business that makes it inaccessible for a woman."

Zelphi Wine's Long agrees, saying that, "as growth in consumption and higher-quality products continue to emerge, the industry will become more competitive and more diverse."

And Bisson says UC Davis' female wine pioneers deserve credit for breaking down those barriers: "There were a lot of talented people who hung with it, who knew they were making a quality product. They emerged as forces in their own right with wines that were so good people had to pay attention to them."

Elisabeth Kauffman is an Advancement Assistant in the dean's office of the College of Agricultural and Environmental Sciences at UC Davis

Agritoursim Can Be Profitable

California farmers and ranchers hosted more than 2.4 million agricultural tourists in 2008, according to early results from California's first statewide economic survey of agritourism operators.

The survey's preliminary findings suggest agritourism can indeed be a profitable supplement to a farm or ranch business. Agricultural tourism allows travelers a chance to visit working farms and ranches and can include experiences such as picking their own fruit, visiting a petting zoo, touring a vineyard, buying fresh produce or riding horses. Small farms made up more than two-thirds of the farms that reported offering agritourism.

"We are excited to find that agritourism really seems to work for a lot of small farms," said Penny Leff, statewide agritourism coordinator for the UC Small Farm Program. "Our results also show that agritourism is primarily local. More than 85 percent of reported visitors were from California."

Most agritourism operators who responded to the survey reported their agritourism businesses generated some profit. A majority said they are planning to expand or diversify their agritourism offerings over the next five years. In addition, 22 percent of agritourism operators reported more than $100,000 in agritourism receipts for 2008.

The survey was conducted by a group of researchers from University of California Cooperative Extension and the UC Small Farm Program, with funding from the California Communities Program. Researchers first mailed questionnaires in January to nearly 2,000 potential agritourism operators in every California county.

Of the 554 responses to the survey, 332 respondents said they currently offer agritourism activities on their farms or ranches. Further analysis will help measure the impacts of agritourism ventures on local economies. The survey will also help researchers identify major challenges faced by agritourism business owners, so that future University of California work can better address those needs.

"Farm operators, visitor bureaus, local government and the media have been asking about the value of agritourism as a profit-generating venue for sustaining family farms for the past decade," said Ellie Rilla, community development advisor for UC Cooperative Extension Marin County and co-author of the 2005 handbook *Agritourism and Nature Tourism in California* (Order form on page 9). "This survey helps provide answers about revenue generation, permitting issues and training opportunities."

Calendar of Events

Local Meetings and Events

San Joaquin Valley Grape Symposium
January 6, 2010
C.P.D.E.S Hall
172 Jefferson St.
Easton, CA
Contact: Stephen Vasquez (559) 456-7285

More information on the way!

6th International Table Grape Symposium
June 24-26, 2010 — Symposium
June 28-30, 2010 — Technical Tour

Contact: Stephen Vasquez or Jennifer Hashim-Buckey at 6thinttablegrapesymposium@gmail.com.

U.C. Davis University Extension Meetings

(800) 752-0881

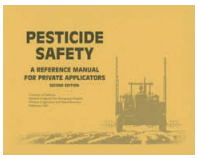
Establishing the Small Vineyard
October 24, 2009
9:00 a.m.— 4:00 p.m.
198 Young Hall, East Quad
Davis, CA
Instructors: Donna Hirschfelt and Rhonda Smith
Section: 092VIT202

Taxation and Accounting for the Small Vineyard
October 26, 2009
9:00 a.m.— 4:00 p.m.
Da Vinci Building, 1632 Da Vinci Ct.
Davis, CA
Instructor: Gregg Scott
Section: 092VIT204

Taxation and Accounting for the Small Winery
October 27, 2009
9:00 a.m.— 4:00 p.m.
Da Vinci Building, 1632 Da Vinci Ct.
Davis, CA
Instructor: Greg Scott
Section: 092VIT205

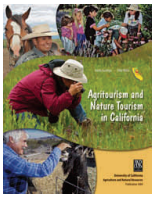
Current Issues in Vineyard Health
November 19, 2009
Da Vinci Building, 1632 Da Vinci Ct.
Davis, CA
Instructor: Deborah Golino
Section: 092VIT202

Publications from the University of California



Pesticide Safety: A Reference Manual for Private Applicators
ANR Publication 3383
Price - $7.00 + tax and shipping

Updated in 2006, this manual covers information essential for anyone using pesticides on California farms, including growers, managers and employees. The manual covers pesticide labels, worker safety (handlers and fieldworkers), how to mix and apply pesticides, calibration, the hazards of pesticide use including heat related illness, and pesticide emergencies.



Agritourism and Nature Tourism in California
ANR Publication 3484
Price - $25.00 + tax and shipping

The easy-to-use workbook will walk you through the steps needed to establish your own tourism enterprise. Included are hands-on activities that can help you assess, plan, develop, and evaluate your farm or ranch's tourism potential.

Order Form

Publication	Qty.	Price	Subtotal
Pesticide Safety		$ 7.00	
Agritourism		$ 25.00	

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

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Shipping Based on Merchandise Total:	
Total Enclosed:	$

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Fresno, CA 93702

UC Cooperative Extension Staff to Furlough

The dire budget climate in California affects each of us in some way. As our clientele, it is important for you to know that academic and program staff with Fresno County UC Cooperative Extension will begin to furlough monthly as of September 1, 2009. The furlough will be in effect through August 31, 2010. The number of days an individual furloughs is based on their salary level and may be anywhere from 11 to 26 days in the coming year.

UC Cooperative Extension is a Fresno County department as well and our county staff (two secretaries and an office manager) will also furlough in the coming year. Each of these individuals will furlough a total of forty hours.

Our office will close for the holidays on Thursday, December 24, 2009 and will open again on Monday, January 4, 2010. Other than this period of time, there is no other planned weekly closure.

The furloughs for both Fresno County and the University of California are designed to address California budget shortfalls.

We will continue to meet the needs of our clientele while respecting the university and county directives to furlough. We appreciate your support and welcome (as always) your comments.

Vine Lines

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

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