

PEST MANAGEMENT ALLIANCE PROJECT FINAL REPORT

The California Winegrape Pest Management Alliance Project

Agreement Number 01-0194C

Karen Ross, Principal Investigator
California Association of Winegrape Growers
601 University Avenue, Suite 135
Sacramento, California 95825
(800) 241-1800 telephone
(916) 924-5374 fax
karen@cawg.org

August 31, 2003

*Prepared for the California Department of Pesticide Regulation
by Joe Browde, Consultant*

DISCLAIMER

The statements and conclusions in this report are those of the contractor and not necessarily those of the California Department of Pesticide Regulation. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

ACKNOWLEDGMENTS

Numerous individuals and organizations have contributed to the success of this project over three years. Therefore, it is somewhat of an injustice to identify certain contributors at the risk of failing to credit others. Nevertheless, a number of people and organizations were and continue to be integral to the success of the project. This includes members of the Winegrape Pest Management Alliance Management Team (**Table 1**) – Kendra Baumgartner, Larry Bettiga, Jeff Bitter, Mike Boer, Jenny Broome, Jeff Dlott, Nick Fry, Patrick Gleeson, Kurt Hembree, Rhonda Hood, Jon Holmquist, Steve Kautz, Randy Lange, George Leavitt, David Lucas, Kelly Maher, Mario Moratorio, Julie Nord, Kris O’Connor, Cliff Ohmart, Steve Quashnick, Jason Smith, Katey Taylor, Lori Ann Thrupp, Ed Weber, and Ken Wilson. Also, the Department of Pesticide Regulation liaison for the project, Sewell Simmons, has provided invaluable support.

The contribution made by grower-cooperators cannot be overstated. The transfer of information from grower to grower is the foundation for the project’s success. Formal grower-cooperators include Frank Alviso, Dennis Atkinson, Hector Bedolla, Eddie Bolt, Alan Butterfield, Martin Carrillo, Steve Carter, Bill Chandler, Steve Christy, John Diener, Ben Drake, Ed Franceschi, Bruce Fry, Kirk Grace, Bart Haycraft, Jon Holmquist, Mark Houser, Ray Jacobsen, Craig Macmillan, John Maffeo, Ron Metzler, Roger Moitoso, Gerald Neuwirth, Julie Nord, Tom Piper, John Rauck, Leland Rebensdorf, Ed Rosenthal, Rich Smith, Katey Taylor, Bob Thomas, Barbara and David Uhlich, Joe Valente, Craig Weaver, Mark Welch, and Gary Wilson (**Table 2**). Many other growers not listed here dedicated time and energy in exchanging pest management information and through other participation.

It is important to identify a number of wineries that helped sponsor field days and workshops and otherwise supported the project. These include Bronco, Canandaigua, Domaine Chandon, E & J Gallo, Fetzer, Kendall-Jackson, and Robert Mondavi.

Finally, it is essential to thank the leadership of the California Association of Winegrape Growers for recognizing the importance of this project for further establishing California’s winegrape industry as leaders in sustainable agriculture and helping sustain the future of viticulture in California. Without their financial support, the project could not have been a reality.

This report was submitted in fulfillment of DPR agreement 01-0194C for the California Winegrape Pest Management Alliance Project by the California Association of Winegrape Growers under the partial sponsorship of the California Department of Pesticide Regulation. Work was completed as of August 31, 2003.

Table 1. Winegrape PMA Management Team

Kendra Baumgartner , USDA-ARS One Shields Avenue Department of Plant Pathology Davis, CA 95616 (530) 754-7461 kbaumgartner@ucdavis.edu	Larry Bettiga , UC Coop Extension Viticulture Farm Advisor 1432 Abbott Street Salinas, CA 93901 (831) 759-7350 lbettiga@ucdavis.edu	Jeff Bitter , Allied Grape Growers 3475 West Shaw Ave, Suite 103 Fresno, CA 93711 (559) 276-7021 jeff@alliedgrapegrowers.org
Mike Boer , AG Unlimited Mendocino Winegrowers Alliance 300 Stipp Lane Ukiah, CA 95482 (707) 468-8154 pirtpete@pacific.net	Jenny Broome , UC SAREP One Shields Avenue DANR Building – Hopkins Road Davis, CA 95616 (530) 754-8547 jcbroome@ucdavis.edu	Joe Browde , Private Consultant 710 Mayflower Street Petaluma, CA 94954 (707) 776-4943 mjbrowde@pacbell.net
Jeff Dlott , RealToolbox 7600 Old Dominion Court, #6 Aptos, CA 95003 (831) 786-0994 jeff@realtoolbox.com	Nick Frey , Sonoma County Grape Growers Association 5000 Roberts Lake Road, Suite A Rohnert Park, CA 94928 (707) 206-0603 frey@sonic.net	Patrick Gleeson , American Vineyard Foundation P.O. Box 414 Oakville, CA 94562 (707) 967-9307 patrick@avf.org
Kurt Hembree , UC Coop Extension Weed Farm Advisor 1720 S. Maple Avenue Fresno, CA 93702 (559) 456-7556 kjhembree@ucdavis.edu	Rhonda Hood , North Coast Winegrowers Association 970 Piner Road Santa Rosa, CA 95403 707) 578-8331 vinovine@sonic.net	Jon Holmquist , Canandaigua Wine Company P.O. Box 99 Madera, CA 93639 (559) 661-5539 jon.holmquist@cwine.com
Steve Kautz , Ironstone Vineyards Calaveras Wine Association 5490 Bear Creek Road Lodi, CA 95240 (209) 334-4786 speyrod@goldrush.com	Randy Lange , Twin Oaks Vineyards CAWG 1298 West Jahant Road Lodi, CA 95220 (209) 339-4055 langetwn@inreach.com	George Leavitt , UC Coop Extension Viticulture Farm Advisor 328 Madera Avenue Madera, CA 93637 (559) 675-7879 ext 206 gmleavitt@ucdavis.edu
David Lucas , Lucas Winery Robert Mondavi Winery 18196 N. Davis Road Lodi, CA 95242 (209) 368-2006 david@lucaswinery.com	Kelly Maher , Domaine Chandon Napa Valley Grape Growers One California Drive Yountville, CA 94599 (707) 738-0350 kellym@napanet.net	Mario Moratorio , UC Coop Extension Farm Advisor 740 Castlewood Court Suisun, CA 94585 (707) 421-6793 msmoratorio@ucdavis.edu
Julie Nord , North Coast Vineyard Services 1326 Hill View Lane Napa, CA 94558 (707) 226-8774 ncvs@aol.com	Kris O'Connor , Central Coast Vineyard Team P.O. Box 248 Atascadero, CA 93422 (805) 462-9431 info@vineyardteam.org	Cliff Ohmart , Lodi-Woodbridge Winegrape Commission 2545 West Turner Road Lodi, CA 95242 (209) 367-4727 COhmart@aol.com
Steve Quashnick , Quashnick Farms CAWG 5727 E. Woodbridge Road Acampo, CA 95220 (209) 369-9202 squash@lodinet.com	Karen Ross , President CAWG 555 University Avenue, Suite 250 Sacramento, CA 95825 (800) 241-1800 karen@cawg.org	Sewell Simmons , DPR Pest Mgt and Licensing Branch 1001 I Street, P.O. Box 4015 Sacramento, CA 95812 (916) 324-4245 ssimmons@cdpr.ca.gov
Jason Smith , Valley Farm Mgt Monterey County Grape Growers P.O. Box Drawer A Soledad, CA 93960 (831) 678-1592 jason2313@aol.com	Katey Taylor , Domaine Chandon Napa Valley Grape Growers One California Drive Yountville, CA 94599 (707) 944-9400 ext 154 katey_taylor@chandon.com	Lori Ann Thrupp , Fetzer Vineyards 5930 Fern Street El Cerrito, CA 94530 (510) 965-9955 Ann_Thrupp@b-f.com
Ed Weber , UC Coop Extension Viticulture Farm Advisor 1710 Soscol Avenue #4 Napa, CA 94559 (707) 253-4221 eaweber@ucdavis.edu	Ken Wilson , Wilson Farms Clarksburg Wine Growers Assoc P.O. Box 307 Clarksburg, CA 95612 (916) 744-1456 Kenneth@wilson-farms.com	

Table 2. Winegrape PMA Grower-cooperators.

Individual	Demo Vineyard Location – Winegrape Region (County)	Reduced-risk Pest Mgt Target
Frank Alviso	Northern Interior (Amador)	Sulfur and Weeds
Dennis Atkinson	S San Joaquin Valley (Kern)	Weeds
Hector Bedolla	North Coast (Sonoma)	Weeds
Eddie Bolt	S San Joaquin Valley (Kern)	Weeds
Allan Butterfield	S San Joaquin Valley (Kern)	Sulfur and Weeds
Martin Carrillo	Northern Interior (Stanislaus)	Sulfur
Steve Carter	Central Coast (San Luis Obispo)	Weeds
Bill Chandler	S San Joaquin Valley (Fresno)	Weeds
Steve Christy	Northern Interior (Stanislaus)	Weeds
John Diener	S San Joaquin Valley (Fresno)	Weeds
Ben Drake	South Coast (Riverside)	Sulfur and Weeds
Ed Franceschi	Northern Interior (Sacramento)	Sulfur
Bruce Fry	Northern Interior (San Joaquin)	Weeds
Kirk Grace	North Coast (Napa)	Weeds
Bart Haycraft	Northern Interior (San Joaquin)	Sulfur and Weeds
Jon Holmquist	S San Joaquin Valley (Madera)	Weeds
Mark Houser	North Coast (Sonoma)	Sulfur
Ray Jacobsen	S San Joaquin Valley (Fresno)	Weeds
Craig Macmillan	Central Coast (Santa Barbara)	Sulfur
John Maffeo	Northern Interior (Stanislaus)	Weeds
Ron Metzler	S San Joaquin Valley (Fresno)	Weeds
Roger Moitoso	Central Coast (Monterey)	Sulfur
Gerald Neuwirth	S San Joaquin Valley (Fresno)	Weeds
Julie Nord	North Coast (Napa)	Sulfur and Weeds
Tom Piper	North Coast (Mendocino)	Sulfur and Weeds
John Rauck	North Coast (Sonoma)	Weeds
Leland Rebensdorf	S San Joaquin Valley (Fresno)	Sulfur
Ed Rosenthal	S San Joaquin Valley (Madera)	Sulfur
Rich Smith	Central Coast (Monterey)	Weeds
Katey Taylor	North Coast (Napa)	Weeds
Bob Thomas	Central Coast (Santa Barbara)	Weeds
Barbara and David Uhlich	Northern Interior (San Joaquin)	Weeds
Joe Valente	Northern Interior (San Joaquin)	Sulfur
Craig Weaver	South Coast (Riverside)	Weeds
Mark Welch	North Coast (Mendocino)	Sulfur and Weeds
Gary Wilson	S San Joaquin Valley (Kern)	Sulfur and Weeds

TABLE OF CONTENTS

Title Page.....	1
Disclaimer.....	2
Acknowledgments.....	3
Table of Contents.....	6
List of Figures & Tables.....	8
Executive Summary.....	9
Body of Report	11
Introduction	11
Results	16
Discussion.....	23
Summary and Conclusions	25
References.....	28
Appendices.....	30
<i>General</i>	
Timetable for Year Three	31
Winegrape Pest Management Alliance – Focus & Timeline.....	32
<i>Growers, PCAs, and Workers (sample events and related material - year three)</i>	
PMA English Workshop, Fresno (agenda)	33
PMA Spanish Workshop, Fresno (agenda)	34
PMA English Workshop, Finley (agenda)	35
PMA English Workshop, Napa (agenda)	36
PMA Spanish Workshop, Napa (agenda)	37

PMA English Workshop, Sebastopol (agenda)	38
PMA Spanish Workshop, Sebastopol (agenda)	39
Winegrape Field Event Survey & Evaluation Form (example).....	40
Participation at Spanish Workshop, Fresno (certificate – Spanish)	41
<i>General Public (sample events and related material - year three)</i>	
Community Forum – Sulfur in Vineyards, Los Olivos (flyer)	42
Afternoon in the Vineyards, Napa Valley (flyer)	43
<i>Written Educational Materials (selected handouts, publications, and Instructor’s guides – year three)</i>	
Overview – The California Winegrape PMA (handout – English).....	44
Overview – The California Winegrape PMA (handout – Spanish).....	45
Best Management Practices for Sulfur in Winegrapes (handout – English)	46
Best Management Practices for Sulfur in Winegrapes (handout – Spanish)	48
Sulfur Dust Stewardship and Safety (Instructor’s Guide – English).....	51
Sulfur Dust Stewardship and Safety (Instructor’s Guide – Spanish).....	56
Practical Neighbor and Community Relations (handout – English).....	61
Pest Management Workshop Set for FSU (article – Grape Grower Mag)	63
The Winegrape PMA – Reflection & Future (article – California Grower)	64
Winegrape PMA Leads Off Seminar Series (article – newsletter)	66
CCWGA Forum Addresses Concerns About Sulfur (article – newsletter)	67
Pest Management Alliance Highlights (article – newsletter)	69
Winegrapes & Neighbors Strive to Find Common... (article – newspaper)	70
Pest Management Alliance Field Day (Spanish article – newspaper)....	72
PMA Section of CAWG Web Site www.cawg.org (design & content)..	73

LIST OF FIGURES & TABLES

Winegrape PMA Management Team	4
Winegrape PMA Grower-cooperators.....	5
Sulfur Drift Incidents by Crop (1997-99).....	13
Sulfur Drift Incidents for Grapes by Region (1997-99).....	13
Herbicide Uses in Winegrapes (1998).....	13
Higher-risk Herbicides Registered for Grapes.....	13
Tasks, Task Elements, and Responsible Individuals/Groups.....	14
PMA Field Events (Field Days and Workshops).....	18
PMA Non-field Events (Meetings and Workshops).....	18
Educational/Outreach Materials prepared during Year Three.....	19
Outside Presentations about PMA and Reduced-risk Practices.....	21
Sulfur Use in California Winegrapes 1997-2001	23
Higher-risk Herbicide Uses in California Winegrapes 1997-2001	23

EXECUTIVE SUMMARY

This report covers those objectives, tasks, and activities related to the third year of the California Winegrape Pest Management Alliance Project (PMA), contract 01-0194C.

PMA is a grower-driven partnership led by a prestigious and diverse Management Team consisting of a Steering Committee and Technical Advisors (**Table 1**). Overall leadership is provided by the California Association of Winegrape Growers (CAWG). In addition to direct funding from the California Department of Pesticide Regulation and CAWG, the project received support via a grant from EPA Region 9 and a vast network of in-kind support, resulting from numerous partnerships established among growers, grower organizations, wineries, regulatory agencies, extensionists, and researchers. Thirty six, formal grower-cooperators help implement the project.

The overarching goal is to promote and increase the adoption of reduced-risk pest management in winegrapes throughout California. The project focuses on the top two statewide problems involving pesticide risks and winegrape production – 1) sulfur drift and 2) uses of herbicides either classified as groundwater contaminants or FQPA (1996 Food Quality Protection Act) priority I (highest risk) materials.

For year three, the specific objective was to intensify and expand statewide demonstration and outreach on sulfur best management practices and reduced-risk weed management. Target audiences were growers and pest control advisors (PCAs), vineyard foremen and workers, and the general public.

A systems-based approach was used to implement three major tasks: 1) demonstrate on-farm reduced-risk practices, 2) expand education and outreach, and 3) evaluate project impact. Elements for demonstration were: (a) collect updated information on regional practices, (b) retain and recruit grower-cooperators, (c) implement reduced-risk options at demonstration vineyards, (d) hold field events for growers, PCAs, and Spanish-speaking foremen and workers, and (e) hold field events for the general public. Elements for expanding education and outreach were: (a) update, refine, and produce new educational material, (b) produce and disseminate material via newsletters and web sites, (c) translate selected material to Spanish, (d) distribute material at field events, and (e) conduct additional outreach to agricultural and non-agricultural communities. Elements for evaluate project impact were: (a) document practices used at demonstration sites, (b) document participation at field events, and (c) monitor and analyze sulfur drift incidents and pesticide uses.

Numerous demonstration and outreach activities were conducted during year three. Twenty-one field events and two non-field events were conducted during which 496 growers and PCAs, 603 vineyard foremen and workers, and 330 members of the general public were educated. Many others were reached via outside presentations, articles (trade magazines, newsletters, web sites, newspapers), widespread distribution of handouts, and one-to-one communication.

Topics for growers and PCAs included presentations on PMA and its objectives, specific reduced-risk strategies and tactics for managing sulfur, weeds, and other key pests; the integration

of sulfur and weed management with sustainable whole farming systems; regulated deficit irrigation strategies and applications; relevant laws and regulations; safe and successful farming at the urban interface; field demonstrations of management practices and results and equipment; and detail about the evolving Sustainable Winegrowing Project and self-assessment workbook.

Significant activities also were conducted for vineyard employees and the general public. Vineyard foremen and workers were trained in Spanish on sulfur best management practices and safety; pesticide laws and regulations; the identification, biology, and reduced-risk management of weeds, glassy winged sharpshooter, and mealybugs; soil and plant water relations; and highway safety. Moreover, PMA indirectly helped establish and/or enhance regional worker-training programs in Napa and Sonoma Counties and on the Central Coast.

PMA activities for year three also included a major effort in public outreach. Through vineyard open houses and forums, the general public was educated about the challenges faced by winegrape growers, that most growers care and act to minimize pesticide risks, and about the efforts by PMA.

PMA is envisioned as a multiple-year project, with significant achievements expected as a result of repetition and expansion of work over time. Nevertheless, first impacts of PMA are found in 2001 pesticide use data, where cumulative use of the nine PMA higher-risk herbicides decreased 30% compared to the pre-PMA baseline averaged over 1997 to 2000. Unfortunately, county budget constraints prevented the timely acquisition of updated data for sulfur drift incidences. Consequently, PMA impacts on drift incidences will be reported elsewhere. Over time, PMA expects to achieve marked reductions in sulfur drift incidents and uses of higher-risk herbicides

Because of state budget problems and the discontinuation of DPR's pest management grants program, it will be difficult to maintain PMA at past levels of productivity. Nevertheless, it is expected that future effort will continue in educating the three key groups – growers and PCAs, foremen and workers, and the general public. The synergy resulting from educating these audiences should reduce real and perceived risks from pesticides and improve inter-group understandings and relationships.

The continued execution of PMA will speed the adoption of reduced-risk pest management among California's 4,400 winegrape growers, protecting the public interest through minimizing human health and environmental risks and promoting sustainable practices in the \$1.89 billion winegrape industry.

BODY OF REPORT

Introduction

The California winegrape community has completed a third year of its partnership with the California Department of Pesticide Regulation (DPR) for the California Winegrape Pest Management Alliance Project (PMA), a project to speed the adoption of reduced-risk pest management in California winegrapes. This report covers objectives, tasks, and activities for the third functional year, June 16, 2002 – August 31, 2003.

The US wine community has adopted a strategic vision to be leaders in sustainable practices (*American Vineyard*, March 2000b). On a statewide level, the California Association of Winegrape Growers (CAWG) has made a commitment to encourage growers to adopt sustainable vineyard practices. This is best exemplified by CAWG's leadership in ensuring the success of PMA (Browde, 2001a-c; Browde, 2003; *Vineyard & Winery Management*, 2001) and through a recent collaboration with the Wine Institute to develop and implement a Code of Sustainable Winegrowing Practices for California. PMA has helped deliver elements of this Code.

Organizational Structure

The PMA Steering Committee was formed in August 1999 as a group of grower organizations and wineries committed to sustainable viticulture. It includes representatives from Allied Grape Growers, American Vineyard Foundation, Calaveras Wine Association, CAWG, North Coast Winegrowers Association, Canandaigua Wine Company, Central Coast Vineyard Team, Clarksburg Wine Growers Association, Lodi-Woodbridge Winegrape Commission, Mendocino Winegrowers Alliance, Monterey County Grape Growers, Napa Valley Grape Growers, Robert Mondavi Winery, and Sonoma County Grape Growers Association. Technical Advisors include representatives from UC Cooperative Extension, UC Sustainable Agricultural Research and Education Program, USDA-ARS, and US EPA Region 9. A representative of DPR is directly associated with and an important contributor to the project. Collectively, the Steering Committee and Technical Advisors constitute the PMA Management Team (**Table 1**).

Individually, California's winegrape associations have shown leadership in educating growers about reduced-risk pest management. Such efforts include those by the Lodi-Woodbridge Winegrape Commission (Ohmart, 1998), the Central Coast Vineyard Team (Central Coast Vineyard Team, 1998), the Sonoma County Grape Growers Association (*American Vineyard*, 2000a), the Napa Sustainable Winegrowing Group (Napa Sustainable Winegrowing Group, 1997), and the Sonoma Valley Vintners and Growers Alliance (Wickerhauser et al., 1998). Importantly, PMA does not duplicate regional efforts but collaborates closely and effectively with regional organizations to complement and expand activities by providing the organizational framework and teamwork for resolving statewide problems through the efficient transfer of pest management information within and among regions.

CAWG provides the institutional structure for PMA. CAWG was founded in 1974 to represent the interests and concerns of wine and concentrate grape growers. Today, CAWG represents over 60% of California's winegrape growers. California ranks first in US winegrapes accounting

for over 90% of all production. The 2000 crop was valued at approximately \$1.89 billion (MKF Research, 2001). Winegrapes are grown in 42 of California's 58 counties on an estimated 458,000 bearing and 110,000 non-bearing acres (CAWG, 2001). There are over 4,400 winegrape growers and 847 wineries that contribute to making wine the number one finished agricultural product in California with an estimated overall economic impact of \$33 billion per year as a sum of total spending (MKF Research, 2001).

Objectives and Tasks

The goals of DPR's Alliance Program, to encourage the development and demonstration of economically sound pest management systems that reduce pesticide risks to human health and the environment, are directly aligned with the goals of the winegrape industry. The combination of regional and statewide winegrape leadership along with the overlap in respective goals is ideal for maintaining a strong and effective PMA partnership with DPR to expedite the adoption of reduced-risk pest management systems in California winegrapes.

The overarching goal of PMA is to promote and increase the adoption of reduced-risk pest management practices in winegrapes throughout California. To complement and expand regional efforts, the project has focused on the top two statewide problems involving pesticide risks and winegrape production – 1) sulfur drift and 2) uses of herbicides either classified as groundwater contaminants or FQPA (1996 Food Quality Protection Act) priority I (highest risk) materials.

For year three, the specific objective was to intensify and expand statewide demonstration and outreach on sulfur best management practices and reduced-risk weed management. The intent was to maintain the breadth of the educational program for winegrape growers, pest control advisors (PCAs), and the general public, while expanding education to vineyard foremen and workers.

Sulfur drift onto sensitive areas is an important concern. Human exposure to sulfur can cause eye and skin irritation and breathing difficulty. Off-site deposition also can result in phytotoxicity to surrounding crops and contaminate surface water. As an active ingredient, sulfur is the most commonly used pesticide in California agriculture and is a key tool for managing powdery mildew – one of the major diseases affecting winegrapes throughout the world. Unfortunately, high profile reports of public complaints of sulfur drift have occurred in recent years. A majority of the reports during the interval 1997 to June 1999 cited grapes as the target source (**Figures 1 and 2**). Moreover, approximately 80% of the reports were attributed to dusting sulfur, extensively used due to its low cost and efficacy. Incidents included drift onto neighboring residences, schools, office buildings, moving vehicles, and workers in surrounding vehicles (Browde and Ohmart, 2001). A key factor for the increase in complaints is the increase in agricultural/urban interfaces. Despite sulfur being approved for organic farming, excessive drift complaints could lead to regulations that limit uses. Continued efforts in educating the winegrowing community and the general public should minimize pesticide drift incidents and help sustain the safe, effective uses of sulfur. Importantly, regulations leading to decreased uses of sulfur could increase uses of FQPA priority I fungicides (e.g. myclobutanil, triflumizole, triadimefon).

Figure 1. Sulfur Drift Incidents by Crop (1997-99)

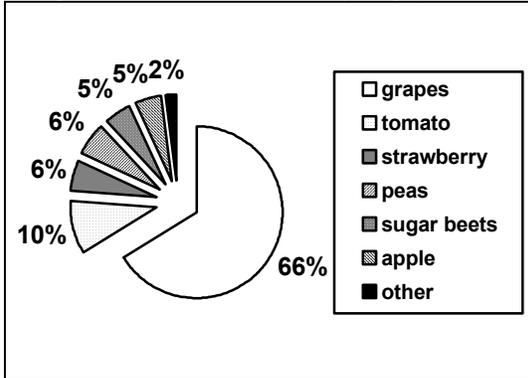
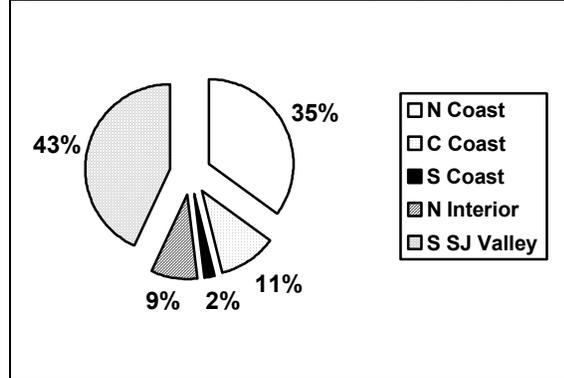


Figure 2. Sulfur Drift Incidents for Grapes by Region (1997-99)



There remain statewide concerns about non-target effects of herbicides. Herbicides used in grape production have been detected in groundwater. Many herbicides registered for grapes also are considered higher-risk materials in terms of human health. FQPA implementation and future state regulations may further restrict available herbicides and uses. This would be problematic since only one (Roundup, glyphosate) of the eight most commonly used herbicides on winegrapes (Figure 3) is considered a lower-risk material (Browde, 2001b-c; Browde 2003). PMA is minimizing non-target risks and ensuring grower preparedness through widespread communication of viable means to reduce uses of herbicides associated with groundwater contamination, i.e. simazine, diuron, and norflurazon, or listed as FQPA priority I materials, e.g. oxyfluorfen, simazine, paraquat, and oryzalin (Table 3).

Figure 3. Herbicide Uses in Winegrapes (1998)

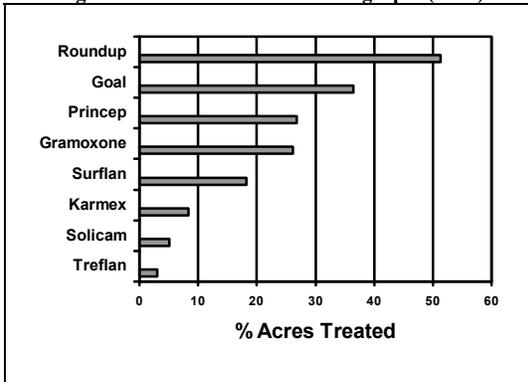


Table 3. Higher-risk Herbicides Registered for Grapes

Risk – water quality	Risk – FQPA I
<ul style="list-style-type: none"> • simazine (Princep) • diuron (Karmex) • norflurazon (Solicam) 	<ul style="list-style-type: none"> • simazine (Princep) • oryzalin (Surflan) • oxyfluorfen (Goal) • paraquat (Gramoxone) • trifluralin (Treflan) • pedamethalin (Prowl) • 2,4-D (Envy)

To develop and execute a statewide educational program on reduced-risk practices for sulfur and weed management, the project had three key tasks for its third year: (1) demonstrate on-farm reduced-risk practices, (2) expand education and outreach, and (3) evaluate project impact. Specific task elements used for achieving each task are listed in Table 4. The expected timeline for third-year activities is included in Appendices.

Table 4. Tasks, Task Elements, and Responsible Individuals/Groups.

Task 1: Demonstrate On-Farm Reduced-Risk Practices Task elements listed below	Responsible for Task and Elements
(a) Inventory regional activities for new sulfur and weed management information	Project Coordinator with assistance from Management Team
(b) Retain and recruit grower-cooperators to establish demonstration vineyards across the five major production regions	Project Coordinator working with Management Team and other regional leadership
(c) Implement reduced-risk options at demonstration vineyards	Grower-cooperators
(d) Hold field events for growers and PCAs and for vineyard foremen and workers in each region	Project Coordinator working with grower-cooperators, voluntary Spanish speakers and translators, and Management Team
(e) Hold field events for the general public in each region to highlight project objectives and demonstrate reduced-risk practices	Project Coordinator working with Management Team and grower-cooperators

Table 4 continued. Tasks, Task Elements, and Responsible Individuals/Groups.

Task 2: Expand Education and Outreach Task elements listed below	Responsible for Task and Elements
(a) Update, refine, and compose new educational material on reduced-risk tactics and programs for managing sulfur and weeds	Project Coordinator with Management Team input and guidance
(b) Produce and disseminate timely content on sulfur and weed management with other project information for winegrower newsletters and web sites	Project Coordinator working with regional and CAWG personnel and contractors
(c) Translate selected educational material to Spanish	Project Coordinator with voluntary Spanish speakers and translators
(d) Distribute educational material on reduced-risk tactics and programs for managing sulfur and weeds at field events	Project Coordinator working with Management Team, grower-cooperators, and voluntary Spanish speakers and translators
(e) Conduct additional outreach to agricultural and non-agricultural communities on the project, reduced-risk practices, and means to improve neighbor/community relations	Regional leadership (Management Team and other regional personnel) working with Project Coordinator and Principal Investigator

Task 3: Evaluate Project Impact Task elements listed below	Responsible for Task and Elements
(a) Document vineyard practices used at demonstration sites	Project Coordinator working with grower-cooperators
(b) Document participation at field events	Project Coordinator working with Management Team
(c) Monitor and analyze annual sulfur drift incidents and pesticide uses and make other measures of project progress and impacts	Project Coordinator working with Management Team and consultant(s)

It was expected that the execution of the objective and associated tasks and elements would lead to measurable results in terms of demonstrating reduced-risk pest management practices in all major California winegrape growing regions, documenting these practices and reductions in risk, tracking and analyzing statewide data for sulfur drift incidents and pesticide uses for powdery

mildew and weeds, and communicating results to agricultural and non-agricultural communities through aggressive outreach.

The project objective is consistent with the overall project goal of further speeding the wide-scale adoption of sustainable vineyard practices including sulfur best management practices and reduced-risk weed management strategies in all winegrowing regions of the state.

Results

The following details project results by task and task element for year three.

Task 1: Demonstrate on-farm reduced-risk practices.

(a) Inventory regional activities for new sulfur and weed management information (original timeline - 1 July – 30 September 2002).

Information has been collected over the course of this project and used as content for numerous PMA educational materials. Much information was collected during the first two years and used to build and refine materials for year three. Although most year-two effort was done during the proposed interval, information acquisition and application has been a continuous activity. New information specific to sulfur use and air quality and for weed identification and management was collected and used for written material and oral presentations.

Updated information was sourced from discussions and field visits with grower-cooperators, other winegrape growers and organizations, pest control advisors (PCAs), Management Team members, UC Cooperative Extension personnel, county agriculture commissioners, farm bureau personnel, winery personnel, university researchers, Sulfur Task Force members, and DPR personnel.

Information also was obtained from pertinent literature such as the *Lodi Winegrower's Workbook* (Ohmart and Matthiasson, 2000); UC IPM Pest Management Guidelines; California Winegrape Crop/Pest Profile (2002); California Winegrape PMA Evaluation (Ross and Dlott, 2000); *Sulfur Best Application Practices Manual* (2000), and *Cover Cropping in Vineyards Handbook* (Ingels et al., 1998); and from resources relevant to managing diseases (Gubler et al., 1998; Gubler and Thomas, 1999; Stapleton et al., 1990) and weeds (Elmore et al., 1998a-b; Varela et al., 1995) and those characterizing the economics of winegrape production (Smith et al., 1999; Klonsky et al., 1998; Klonsky et al., 1997; Takele and Bianchi, 1996).

(b) Retain and recruit grower-cooperators to establish demonstration vineyards across the five major production (original timeline - 1 October – 31 December 2002).

Thirty six grower-cooperators (**Table 2**) were retained as formal, PMA grower-cooperators across five winegrowing regions – North Coast (8), Central Coast (5), South Coast (2), Northern Interior (9), and South Central Valley (12). Cooperators implemented various strategies and tactics for managing sulfur and weeds based on circumstances specific for their regions and vineyards. Importantly, cooperators then demonstrated and/or described lower-risk practices at

field days, workshops, and seminars. Numerous other growers assisted the project by hosting events, making presentations, and leading outreach efforts. Demonstration efforts across the state covered a wide variety of challenges and reduced-risk alternatives for managing sulfur, weeds, and other pests.

Results from analyses of pesticide use report data and sulfur drift incidents were used to target and recruit cooperators as spokespersons for reduced-risk approaches and for positioning demonstration vineyards.

(c) Implement reduced-risk alternatives at demonstration vineyards (original timeline - continuous).

For year three, the implementation of reduced-risk strategies and tactics for managing weeds began November 2002. Cooperators started implementing best management practices for sulfur in March 2003. Throughout the project, demonstration vineyards have been used as locations for PMA events, and for enabling attendees to visualize pest management tactics, vineyard and surrounding environments, and results of management efforts.

(d) Hold field events for growers and PCAs and for Spanish-speaking foremen and workers at demonstration sites in each region (original timeline - begin January 2003).

A total of 12 PMA events with field components were conducted for these two groups during year three – seven in English for winegrowers and PCAs and five in Spanish for vineyard foremen and workers (**Table 5**). Workshops and field days emphasized topics relevant to sulfur best management practices and reduced-risk weed management but included other current pest- and vineyard-related topics, such as mealybug and glassy-winged sharpshooter identification and management and regulated deficit irrigation. Many agendas for these events are included in **Appendices**.

In addition, for the second consecutive year, the module Sulfur Stewardship and Safety was taught by PMA-trained trainers in English and Spanish at the Lodi Farm Safety Day. Although not including field demonstrations, this substantial investment in teaching vineyard workers used simulations and hands-on interaction to demonstrate sulfur best management practices (**Table 6**).

(e) Hold field events for the general public in each region to highlight project objectives and demonstrate reduced-risk practices (original timeline - begin April 2003).

Nine PMA field events for the general public were held during year three (**Table 5**). All were held in the North Coast, a result of the Napa Valley Vineyard Open House Program that PMA established and continues to help implement. One PMA non-field public forum on sulfur in vineyards was held in the Central Coast (**Table 6**), providing an opportunity for honest exchange between the winegrowing community and general public about the concerns and characteristics of dusting sulfur.

Table 5. PMA Field Events (Field Days and Workshops); NC=North Coast, CC=Central Coast, NI=Northern Interior, SSJ=South Central Valley.*Target audience = winegrowers and PCAs*

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
4/01/03	Fresno (SSJ)	Sulfur, Weeds, other pests	158
4/02/03	Lodi (NI)	Weeds (key), Sulfur	75
4/23/03	Finley (NC)	Weeds (key), Sulfur	52
4/24/03	Napa (NC)	Sulfur, Weeds, other pests	101
4/25/03	Sebastopol (NC)	Sulfur, Weeds, other pests	78
5/07/03	Soledad (CC)	Weeds (key), Sulfur	13
5/07/03	Templeton (CC)	Weeds (key), Sulfur	<u>19</u>
			496 total

Target audience = vineyard foremen and workers

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
4/01/03	Fresno (SSJ)	Sulfur, Weeds, other pests (Span)	34
4/24/03	Napa (NC)	Sulfur, Weeds, other pests (Span)	100
4/25/03	Sebastopol (NC)	Sulfur, Weeds, other pests (Span)	24
5/07/03	Soledad (CC)	Weeds (key), Sulfur	2
5/07/03	Templeton (CC)	Weeds (key), Sulfur	<u>3</u>
			163 total

Target audience = general public

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
5/17/03	Napa (NC) – 9 vineyards	Gen Vit & RR pest mgt	270

Table 6. PMA Non-field Events (Meetings and Workshops); NC=North Coast, CC=Central Coast, NI=Northern Interior, SSJ=South Central Valley.*Target audience = vineyard foremen and workers*

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
2/28/03	Lodi (NI; farm safety day)	Sulfur (Span & Eng)	440

Target audience = general public

<u>Date</u>	<u>Location (region)</u>	<u>Topic(s)</u>	<u>No. attendees</u>
1/21/03	Los Olivos (CC)	Sulfur, RR pest mgt, Gen Vit	60

Task 2: Expand education and outreach.

(a) Update, refine, and compose new educational material on reduced-risk tactics and programs for managing sulfur and weeds (original timeline - 1 August – 31 December 2002).

Over the previous two years, teams composed of the project coordinator, principal investigator, winegrape growers, PCAs, and representatives of UCCE, UC-SAREP, EPA, and DPR produced an assortment of educational material (in English and Spanish) pertaining to sulfur best management practices and reduced-risk weed management. Materials include instructor's guides, handouts, and articles published in trade magazines, newsletters, and on web sites (Browde, 2001d; Browde 2002). Upon careful evaluation, many of these materials required no change and formed the basis of that distributed or communicated in year three.

Educational materials newly prepared and distributed or communicated during year three are listed in **Table 7**, and many are included in **Appendices**.

Table 7. Selected PMA Educational/Outreach Materials prepared during Year Three.

<u>Release</u>	<u>Where</u>	<u>When</u>
Know Your Weeds	handouts library	numerous
Common Vineyard Weed Seedlings (photos & descripts)	handouts library	numerous
Pest Management Workshop set for FSU	Grape Grower Mag	March 2003
The Winegrape Pest Management Alliance Reflection & Future	California Grower Mag	Vol. 26, no. 10
Sulfur Best Management Practices in Vyds, Issues at the Ag/Urban Interface	power point presentation	DPR Dec 2003
Update – The California Winegrape Pest Management Alliance	power point presentation	Lakeport Nov 2002
Pesticide Use in Madera County Winegrapes	power point presentation	PMA Mtg Nov 2002
California Winegrapes: Building Partnerships in Pest Mgt	power point presentation	IPM Symp Apr 2003
Advances in Understanding Powdery Mildew	power point presentation	CSU-Fres Apr 2003
Sulfur, Mites, and Cost Considerations	power point presentation	numerous
Weed Identification and Management	power point presentation	numerous
Mealybugs – ID and Discussion (Span)	power point presentation	numerous
Glassy-winged Sharpshooter – ID and Discussion (Span)	power point presentation	CSU-Fres Apr 2003
Regulated Deficit Irrigation	power point presentation	numerous
Soil/Plant Water Relations (Span)	power point presentation	Napa Apr 2003
On-Farm Innovation: IDing Farmer Innovs of Low Risk Pest Mgt using PUR	power point presentation	PUR Mtg June 2003
Winegrapes and Their Neighbors Strive to Find a Common Ground to Grow On	Santa Maria Times	January 2003

Table 7 continued. Selected PMA Educational/Outreach Materials prepared during Year Three.

<u>Release</u>	<u>Where</u>	<u>When</u>
People at Work – Safety Programs for Farmworkers	Easy English Times	April 2003
Abril 25, dia Dedicado a La Alianza del Manejo de Plagas	La Voz Bilingual News	April 2003
14+ Newsletter articles	reg/statewide ag newsletters	June 16 – August 31
26+ Web site contributions	reg/statewide ag web sites	June 16 – August 31

Although PMA focuses on sulfur and weed management, the educational information (written and oral) provided by PMA advocates uses of biologically based, lower-risk approaches for managing all winegrape pests and stresses how non-pest components of grape production (e.g. irrigation management) can impact pest and whole-farm management.

(b) Produce and disseminate timely content on sulfur and weed management with other project information for winegrower newsletters and web sites (original timeline – continuous).

During year three, various articles about PMA, sulfur and weed management, and means to improve relationships with neighbors were included in regional and statewide winegrower newsletters (14+ publications) and web sites (26+ publications) (**Table 7**). A key achievement was updating the design and content for the PMA section of the CAWG web site (www.cawg.org), as detailed in **Appendices**.

(c) Translate selected educational material to Spanish (original timeline - 1 September – 31 December 2002).

Much of the written material used for educating Spanish-speaking vineyard foremen and workers during this reporting interval was translated during year two. These included handouts (*Best Management Practices for Sulfur in Winegrapes*, and *PMA Overview*) and an instructor's guide (*Sulfur Dust Stewardship and Safety*).

However, several power point presentations in Spanish were newly prepared including: *Mealybugs – Identification and Discussion*, *Glassy-winged Sharpshooter – Identification and Discussion*, and *Soil/Plant Water Relations*. Additional educational information in Spanish, including that for sulfur and weeds, was presented informally at PMA events.

(d) Disseminate educational materials on sulfur best management practices and reduced-risk weed management at field events (original timeline – begin January 2002).

Pertinent materials produced by PMA to date (in English and Spanish) were distributed at all workshops, field days, seminars, trainings, and forums for growers and PCAs, vineyard foremen and workers, and the general public.

(e) Conduct additional outreach to agricultural and non-agricultural communities on the project, reduced-risk practices, and means to improve neighbor/community relations (original timeline - continuous).

In addition to PMA-sponsored events, numerous outside opportunities were sought to share information about PMA, its objectives, and specific reduced-risk practices for managing sulfur, weeds, and other pests. For year three, these activities included 17 outside presentations predominantly to the agricultural community (**Table 8**) and three newspaper articles predominantly for the general public (**Table 7**). Moreover, PMA handouts and other educational material were distributed at all meetings where PMA presentations were made and at other grower, vintner, and public events.

Table 8. Outside Presentations about PMA and Reduced-risk Practices; NC=North Coast, CC=Central Coast, NI=Northern Interior, SSJ=South Central Valley.

<u>Date</u>	<u>Event</u>	<u>Topic(s)</u>
7/18/03	Sust Winegrowing Meeting (statewide)	PMA overview
8/06/03	Pesticide Sprayers Industry Meeting (NC)	PMA overview
8/07/03	SCGGA IPM Meeting (NC)	PMA poster
9/25/02	UCCE Weed School (SSJ)	Weeds
10/1/02	BIFS Workgroup Meeting (statewide)	PMA overview
10/23/02	EPA Officials Tour (national)	PMA overview
11/12/02	BIFS Project Meeting (statewide)	PMA overview
11/15/02	Lake Co Growers Meeting (Lakeport)	PMA update
12/10/02	DPR Seminar (statewide)	PMA & sulfur
1/7/03	CCWA/Com Env Council Meeting (CC)	PMA & sulfur
2/4/03	PUR Workshop (statewide)	PMA & PUR winegrape analysis
3/5/03	Napa Co Vit Tech Meeting (NC)	PMA & sulfur
3/28/03	UC-IPM PSEP Meeting (statewide)	PMA overview
4/2/03	Napa Co Span Vit Tech Meeting (NC)	Mealybug ID & management
4/9/03	IPM Symposium (national)	PMA & winegrape partnerships
6/20/03	Dupont Crop Prot Meeting (national)	PMA & winegrape partnerships
6/27/03	PUR Workgroup Meeting (statewide)	PMA & PUR winegrape analysis

Task 3: Evaluate project impact.

(a) Document vineyard practices used at demonstration sites (original timeline - continuous).

The project coordinator acquired a number of cooperator records of reduced-risk practices for sulfur and weed management. Records were used for characterizing and communicating various low-risk tactics and programs, including economic considerations, for winegrowers, PCAs, and vineyard foremen and workers.

(b) Document participation at field events (original timeline - begin January 2003).

Participation at PMA field and non-field events during year three is detailed in **Tables 5 and 6**, respectively. Through these events, PMA educated an estimated 496 winegrape growers and PCAs, 603 vineyard foremen and workers, and 330 members of the general public. Numerous others were alerted to PMA and its teachings as a result of 17 outside presentations (**Table 8**).

(b) Monitor and analyze annual sulfur drift incidents and pesticide uses and make other measures of project progress and impacts (original timeline - continuous).

Analysis of sulfur drift incidences and pesticide uses has provided both a quantitative basis for measuring progress and an understanding of where additional demonstration and outreach effort needs to be targeted. Commencement of PMA teachings began in August 2000, therefore, first effects of the program on drift incidences and pesticide uses were expected for year 2001 data.

Statewide records (1997- mid June 1999) for sulfur drift incidences were quantified and published (Browde 2001b-c; Browde and Ohmart, 2001). Similar data for the remainder of 1999 and 2000 has been obtained. Unfortunately, county budget constraints have been a factor in delaying the timely collection and reporting of 2001 and 2002 data. A complete summary and analysis of sulfur drift incidences and, importantly, impacts of PMA is planned for later release.

The DPR pesticide use report database was used to generate statewide sulfur and selected herbicide uses for winegrapes from 1997 to 2001 (**Figures 4 and 5**). The total pounds of active ingredient decreased by 4.8 million pounds from 2000 to 2001 – the year of expected first PMA impact. Much of this decrease was associated with sulfur, although sulfur remained 87% of all active ingredient applied – a percentage nearly constant for each year displayed here (**Figure 4**). Reduced uses of all but two of the nine higher-risk herbicides targeted by PMA also were found (**Figure 5**). Only diuron and norflurazon uses did not decrease over this two-year interval. Importantly, marked percent reductions were found for two of the most frequently applied higher-risk herbicides, simazine (18%) and oxyfluorfen (27%).

Because myriad factors affect annual pesticide use, averages or trends over years present a more realistic understanding of likely PMA (and other similar regional and statewide programs) effects. Accordingly, 1997 through 2000 averages were used to constitute pre-PMA baselines. Comparing these four-year averages to 2001, decreases in pounds of active ingredient were 24% across all active ingredients, 23% for sulfur and 30% for the total of all nine PMA higher-risk herbicides. These reductions are especially impressive, since statewide winegrape acreage increased each year. Factors external to PMA (e.g., economic and weather conditions) clearly affected these reductions. Yet, the fact that the decrease in use of higher-risk herbicides exceeds that for all active ingredients presents strong evidence of a significant contribution by PMA.

Figure 4. Sulfur Use in California Winegrapes 1997-2001

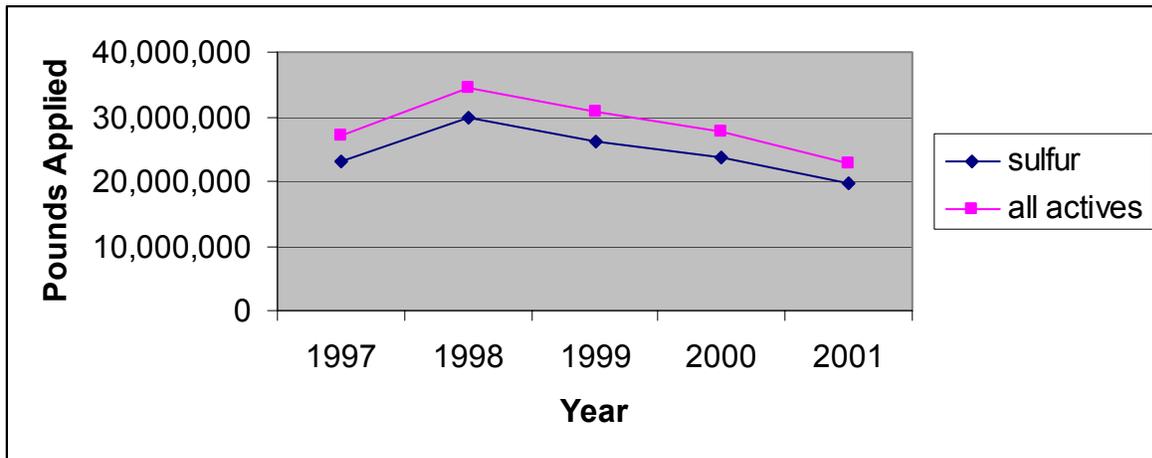
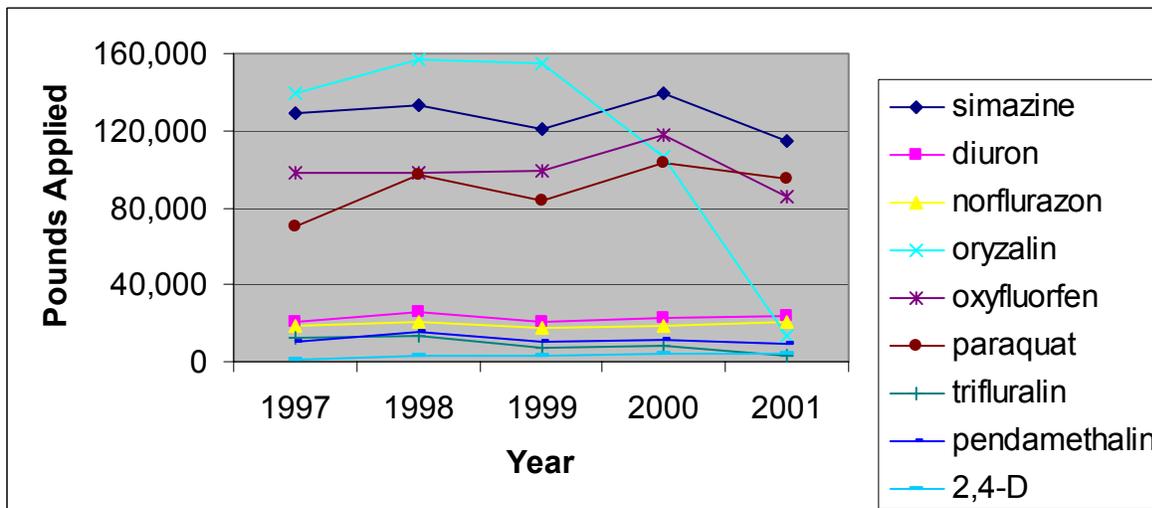


Figure 5. Higher-risk Herbicide Uses in California Winegrapes 1997-2001



Discussion

The specific goal of PMA has been to develop and execute a statewide program to demonstrate and expand outreach on sulfur best management practices and reduced-risk weed management. During its first year, significant progress was made in designing and implementing a successful program for winegrape growers and PCAs, and in starting a limited public educational program (Browde, 2001d). Effort was substantially increased in year two to include an expanded outreach program for the general public and to begin the important activity of educating the vineyard workforce, predominantly in Spanish (Browde, 2002).

The planned effort for year three was to maintain educational programs for growers and PCAs and for the general public while expanding efforts in training vineyard foremen and workers about reduced-risk pest management practices. In fact, PMA field and non-field events conducted during year three resulted in the education of significant numbers of each target audience.

For growers and PCAs, both the number of events and total attendance exceeded that for year two, as an estimated 496 growers and PCAs were educated through seven PMA led or co-led events. Events were held in the four major winegrowing regions – North Coast (3 events), Central Coast (2 events), Northern Interior (1 event), and South Central Valley (1 event). Designs included participation and presentations by growers, PCAs, extensionists, researchers, and county regulators. Topics included presentations on PMA and its objectives, specific reduced-risk strategies and tactics for managing sulfur, weeds, and other key pests; the integration of sulfur and weed management with sustainable whole farming systems; regulated deficit irrigation strategies and applications; relevant laws and regulations; safe and successful farming at the urban interface; field demonstrations of management practices and results and equipment; and detail about the evolving Sustainable Winegrowing Project and self-assessment workbook.

For the second consecutive year, a large number of vineyard foremen and workers were educated across California. A total of 603 vineyard employees attended six events conducted over the North Coast, Central Coast, Northern Interior, and South Central Valley. During the previous year, the majority of training for foremen and workers involved sulfur best management practices and safety. For year three, however, pest-related topics were expanded to include pesticide laws and regulations; the identification, biology, and reduced-risk management of weeds, glassy winged sharpshooter, and mealybugs; as well as the continued emphasis on sulfur. Moreover, presentations and equipment displays about soil and plant water relations were made, and a presentation on highway safety.

The success of PMA's worker education thrust should not be understated. In addition to directly sponsoring the aforementioned events, PMA has greatly affected the establishment and conduct of regional worker-training programs. Due in part to PMA's success and influence, separate programs for training vineyard employees have begun in Napa County (Spanish Viticulture Technical Group), Sonoma County (Sonoma County Spanish Language Education Program), and the Central Coast (Central Coast Vineyard Team's Spanish Speaker Program).

PMA activities for year three also included continued activity in public outreach. A total of nine vineyard open houses and one forum were held to exchange information between the winegrowing community and the general public about concerns over the toxicity and off-site movement of dusting sulfur, the challenges faced by winegrowers, that most growers care and act to minimize pesticide risks, and the efforts by PMA. An estimated 330 members of the general public attended these 10 exciting and enlightening events.

It is important to note that numerous other growers, PCAs, vineyard employees, and members of the general public have been exposed to PMA and its teachings on reduced-risk pest management via outside presentations, trade magazine and professional society articles,

newsletter and web site publications, widespread distribution of handouts, and one-to-one communication.

During the course of the PMA, activities have been extremely successful and a result of effective collaborations (i.e., partnerships) among individuals and groups from different backgrounds and interests working towards the common goals of increasing the adoption of reduced-risk pest management and improving relations between agricultural and non-agricultural communities. Key collaborations that continue to contribute to PMA's success are the buy-in and assistance from major wineries across the state (e.g., Bronco, Canandaigua, Domaine Chandon, E & J Gallo, Fetzer, Kendall-Jackson, and Robert Mondavi), the cooperation and information sharing across winegrowing regions and grower organizations, and the combined effort by PMA, the Sulfur Task Force, county agriculture commissioners, UC Cooperative Extension, and DPR in reducing sulfur drift incidents through jointly prepared and shared presentations and compositions.

PMA has been envisioned as a multiple-year project, with significant achievements expected as a result of repetition and expansion of work over time. It was expected that direct measures of PMA effectiveness would include marked reductions in sulfur drift incidences and uses of higher-risk herbicides, beginning with year 2001 data. Baseline data for sulfur drift incidences has been obtained, but, unfortunately, county budget constraints have been a factor in delaying the timely collection and reporting of incidents for 2001 and 2002. Therefore, a definitive summary and analysis of collective sulfur stewardship impacts cannot be included here but will be reported separately.

Because pesticide use report data is available for 2001, first impacts of PMA are evident. When compared to baselines averaged over 1997 to 2000, total statewide pesticide use on winegrapes in 2001 decreased by 24%. This included a 23% reduction in sulfur use and, importantly, a 30% cumulative reduction in uses of the nine PMA higher-risk herbicides. Numerous factors (especially economic) inevitably contributed to these substantial decreases in pesticide uses. However, the adoption of reduced-risk pest management practices as a result of PMA and related sustainable viticulture programs must be considered a key factor.

Because of state budget problems and the discontinuation of DPR's pest management grants program, it will be difficult to maintain PMA at past levels of productivity. Nevertheless, it is expected that future effort will continue in educating the three key groups – growers and PCAs, foremen and workers, and the general public. Collectively, these groups directly or indirectly influence vineyard activities. Unfortunately, most educational programs promoting reduced-risk agriculture target only those English speakers directly involved in production. The synergy resulting from educating the three groups described here should greatly reduce real and perceived risks associated with pesticides and improve inter-group understandings and relationships.

Summary and Conclusions

PMA is envisioned as a multiple-year project, with significant progress anticipated as a result of repetition and expansion of effort. Key objectives over the three years are detailed below.

Year one (June 15, 2000 – June 30, 2001)

- Begin significant grower and PCA education for reduced-risk pest management (key targets = sulfur and weeds)
- Begin activities in public education (general target = growers care and act, e.g. PMA)

Year two (July 1, 2001 – June 15, 2002)

- Continue grower and PCA education for reduced-risk pest management (key targets = sulfur and weeds)
- Expand activities in public education (general target = growers care and act; e.g. PMA)
- Begin activities in foremen and worker education (key targets = sulfur and weeds)

Year three (June 16, 2002 – June 30, 2003)

- Continue grower and PCA education for reduced-risk pest management (key targets = sulfur and weeds)
- Continue activities in public education (general target = growers care and act; e.g. PMA)
- Expand activities in foremen and worker education (key targets = sulfur and weeds)
- Begin transitioning PMA to help implement Code for Sustainable Winegrowing Practices

In summary, PMA had a successful third year. Significant accomplishments were:

- 1) Continued buy-in and assistance from grower organizations and major wineries, e.g., Bronco, Canandaigua, Domaine Chandon, E & J Gallo, Fetzer, Kendall-Jackson, and Robert Mondavi
- 2) Continued partnerships with DPR, EPA, USDA, UC Cooperative Extension, UC Sustainable Agriculture and Education Program, Sulfur Task Force, agriculture commissioner's offices, county farm bureaus, growers and grower organizations, PCAs, and wineries
- 3) 36 formal grower-cooperators retained - North Coast (8), Central Coast (5), South Coast (2), Northern Interior (9), South Central Valley (12) – **Table 2**
- 4) 21 field events – 7 for growers and PCAs totaling 496 attendees, 5 for foremen and workers totaling 163 attendees, and 9 for the general public totaling 270 attendees – **Table 5**
- 5) 2 non-field events – 1 for foremen and workers totaling 440 attendees, and 1 for the general public totaling 60 attendees – **Table 6**
- 6) 17 outside presentations made to agricultural community – **Table 8**
- 7) 2 articles in trade magazines – **Table 7**
- 8) 14+ newsletter and 26+ web site publications – **Table 7**
- 9) 2 handouts, 12 powerpoint presentations, and 3 newspaper articles – **Table 7**

The activities conducted by PMA have advanced concepts and application of reduced-risk pest management for winegrapes across the state by complementing and expanding regional integrated pest management and integrated farming programs and by providing crucial inter-regional sharing of information. The purpose is to promote sensible practices that limit environmental and human health risks from pesticides, keep growers in business (i.e., minimize economic risk), and foster positive human interaction. Efforts are expected to have continued impacts on reducing incidents of sulfur drift, reducing uses of higher-risk herbicides and other pesticides, and improving understandings and relationships between the agricultural community and the general public.

REFERENCES

- American Vineyard. 2000a. State Awards Grant for Vineyard Pest Management Study. p. 17, American Vineyard, March 2000.
- American Vineyard. 2000b. Wine Vision Consensus on Strategic Plan. p. 21, American Vineyard, March 2000.
- Browde, J. 2001a. Taking Charge. Pp. 26H-26I, Western Fruit Grower, February 2001.
- Browde, J. 2001b. The Winegrape Pest Management Alliance. Pp. 8-9, 19-20, CAPCA Adviser, May/June 2001.
- Browde, J. 2001c. Winegrowers Help Themselves Through Statewide Effort. Pp. 23-25, California North Coast Vineyard News, Summer 2001.
- Browde, J. 2001d. Pest Management Alliance Project Final Report, Agreement Number 99-0257.
- Browde, J. 2002. Pest Management Alliance Project Final Report, Agreement Number 00-0208S.
- Browde, J. 2003. The Winegrape Pest Management Alliance – Reflection and Future. California Grower, Vol. 26 (10).
- Browde, J. and C. Ohmart. 2001. Improving Sulfur Management. pp. 11-12., Practical Winery & Vineyard, May/June 2001.
- California Farmer. 2000. IPM Innovators. p. 8, California Farmer, Mid-March 2000.
- California Winegrape Crop/Pest Profile. 2002. California Grape Advisory Team. FQPA Grape Partnership.
- Central Coast Vineyard Team. 1998. Central Coast Vineyard Team Positive Points System. Practical Winery and Vineyard, May/June pages 12-24.
- Elmore, C., H.S. Agamalian, D. Donaldson, and B.B. Fischer. 1998a. Weeds. *In* M.L. Flint (ed.) UC IPM Pest Management Guidelines: Grape. University of California Division of Agriculture and Natural Resources.
- Elmore, C.L., D.R. Donaldson, and R.J. Smith. 1998b. Effects of cover cropping on pest management: Weed management. *In* C. Ingels, P. Christensen and G. McGourty (eds.), Cover Cropping in Vineyards: A Growers Handbook, pp. 93-106. University of California Division of Agriculture and Natural Resources Publication 3338.
- Gubler, D., J. Stapleton, G. Leavitt, A. Purcell, L. Varela, and R.J. Smith. 1998. Diseases. *In* M.L. Flint (ed.) UC IPM Pest Management Guidelines: Grape. University of California Division of Agriculture and Natural Resources.
- Gubler W. D. and C.S. Thomas. 1999. Implementation of a regional disease warning system: a university perspective. *Phytopathology*.
- Ingels, C. A., R. L. Bugg, G. T. McGourty, and P. Christensen (eds.). 1998. Cover Cropping in Vineyards: A Grower's Handbook. University of California, Division of Agriculture and Natural Resources Publication 3338.
- Klonsky, K., Elkins, R., and P. Livingston, 1998. Sample Costs to Establish a Vineyard and Produce Wine Grapes: Sauvignon Blanc in Lake County. 1998 Sauvignon Blanc Cost and Return Study, Lake County. University of California.
- Klonsky, K., B. Beede, P. Christensen, M. Costello, N. Dokoozlian, G. Leavitt, D. Luvisi, M. Norton, B. Peacock, and P. Livingston. 1997. Sample Costs to Establish a Vineyard and Produce Wine Grapes: San Joaquin Valley, 1997. University of California.
- Napa Sustainable Winegrowing Group. 1997. Integrated Pest Management. Field Handbook for Napa County. First Edition.

- Ohmart, C. P. 1998. Lodi-Woodbridge Winegrape Commission's Biologically Integrated Farming System for Wine Grapes. Final Report.
- Ohmart, C. P. and S. K. Matthiasson. 2000. Lodi Winegrower's Workbook: A Self-Assessment of Integrated Farming Practices. Lodi-Woodbridge Winegrape Commission, Lodi, CA.
- Ross, K. and J. Dlott. 2000. California Winegrape Pest Management Alliance Evaluation.
- Smith, R., K. Klonsky, and P. Livingston, 1999. Sample Costs to Establish a Vineyard and Produce Wine Grapes: Chardonnay in Sonoma County. 1999 Chardonnay Cost and Return Study, Sonoma County. University of California.
- Stapleton, J. J., W. W. Barnett, J. J. Marois, and W. D. Gubler. 1990. Leaf removal for pest management in wine grapes. Calif. Agric. 44(5): 15-17.
- Sulfur Best Application Practices Manual. 2000. Coalition for Urban/Rural Environmental Stewardship.
- Takele, T. and M. Bianchi. 1996. Sample Costs to Establish a Vineyard and Produce Wine Grapes: Drip Irrigated Chardonnay in Santa Mara Valley. University of California.
- Varela, L., C. Elmore, K. Klonsky, and W.A. Williams. 1995. Cultural management of vine row weeds in North Coast vineyards. Davis: University of California Statewide IPM Project 1995 Final Report.
- Vineyard & Winery Management. 2001. Are You a Good Neighbor? P. 6, Vineyard & Winery Management, May/June 2001.
- Wickerhauser, O., R. Smith, and L. Varela. 1998. Sonoma Valley Vintners & Growers Alliance and University of California Cooperative Extension. Development of Integrated Pest Management Approaches for Wine Grape Growing areas of Sonoma Valley.

APPENDICES

Timetable – Expected timeline for third year tasks (June 16, 2002 to June 30, 2003). Light gray marks the starting point and black the completion dates (if discrete item) for each task element.

	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Task 1: Demonstrate On-farm Reduced-risk Practices Task Elements Listed Below																
(a) Inventory regional activities for new information related to sulfur and weed management				█	█	█	█									
(b) Retain and recruit grower-cooperators to establish demonstration vineyards across the five major production regions								█	█	█						
(c) Implement reduced-risk practices at demonstration vineyards				On going												
(d) Hold two field events for growers and PCAs and two for Spanish-speaking foremen and workers at demonstration sites in each region											█	█	█	█	█	
(e) Hold two field events for the general public in each region to highlight PMA objectives and demonstrate reduced-risk practices														█	█	█
Task 2: Expand Education and Outreach Task Elements Listed Below																
(a) Update, refine, and compose new educational material on reduced-risk tactics and programs for managing sulfur and weeds						█	█	█	█	█	█					
(b) Produce and disseminate timely content on sulfur and weed management with other PMA information for winegrower newsletters and web sites				On going - @ bi-monthly intervals												
(c) Translate selected educational material to Spanish							█	█	█	█						
(d) Distribute educational material on reduced-risk tactics and programs for managing sulfur and weeds at field events											█	█	█	█	█	█
(e) Conduct additional outreach to ag and non-ag communities on PMA, reduced-risk practices, and means to improve neighbor/community relations				On going												
Task 3: Evaluate Project Impact Task Elements Listed Below																
(a) Document vineyard practices used at demonstration sites				On going												
(b) Document participation at field events												█	█	█	█	█
(c) Monitor and analyze annual sulfur drift incidents and pesticide uses and make other measures of project progress				On going												

WINEGRAPE PEST MANAGEMENT ALLIANCE – FOCUS & TIMELINE

Focus

To review, PMA is a statewide grower-driven effort to minimize pesticide risks in winegrape production and to improve understandings and relationships between the agricultural community and the general public. Our purpose is to promote sensible practices that limit environmental and human health risks from pesticides, keep growers in business (i.e., minimize grower economic risk), and foster positive human interaction. Two areas of focus continue to be best management practices for sulfur and reduced-risk weed management, although we emphasize how management tactics for sulfur and weeds relate to and fit into a whole-systems, integrated farming approach.

Timeline x Objectives

- July 2000 – June 2001 (Year 1): Begin Eng-speaking grower/PCA education (focus sulfur & weed mgt)
Begin public education (model = PMA & regional actions)

- July 2001 – June 2002 (Year 2): Continue Eng-speaking grower/PCA education (focus sulfur & weed mgt)
Expand public education (model = PMA & regional actions)
Begin foremen/worker education (focus sulfur & weed mgt in Spanish)

- July 2002 – June 2003 (Year 3): Continue Eng-speaking grower/PCA education (focus sulfur & weed mgt)
Continue public education (model = PMA & regional actions)
Expand foremen/worker education (focus sulfur & weed mgt in Spanish)

FREE WINEGRAPE PEST MANAGEMENT ALLIANCE WORKSHOP AGENDA
TUESDAY, APRIL 1, 2003

California State University, Fresno - Satellite Student Union and Viticulture and Enology Building

Presented by:

*Fresno State Viticulture and Enology Research Center and Department of Viticulture and Enology,
E & J Gallo Winery, Central California Winegrowers, Canandaigua Wine Company,
California Association of Winegrape Growers, and Allied Grape Growers*

8:00 am Registration for ENGLISH program – Satellite Student Union (SSU)

9:00 am Registration for SPANISH program – Viticulture and Enology Building (VE)

PROGRAM IN ENGLISH (SSU)

8:00 am Registration, Refreshments, & Weed ID Activity
*refreshments provided by Allied Grape Growers and
Central California Winegrowers*

8:45 am Welcome

Joe Browde, Winegrape Pest Management Alliance

**9:00 am Advances in Understanding and Managing
Powdery Mildew**

Gary Grove, Washington State University

9:30 am Sulfur, Mites, and Cost Considerations
Michael Costello, Cal Poly State University

10:00 am Air Quality Issues in the Central Valley
Manuel Cunha, Nisei Farmers League

10:30 am BREAK, Refreshments, & Weed ID Activity

10:50 am Characterizing and Managing Mealybugs
Kent Daane, University of California, Berkeley

11:20 am Code of Sustainable Winegrowing - Status
Steve Schafer, Schafer Ranch

11:40 am Reduced-risk Weed Management – Growers
Mitch Bagdasarian
Joe Soghomonian
Randy Kazirian

12:00 noon Weed ID and Controls - Discussion
Kurt Hembree, UCCE Fresno County

1:00 pm LUNCH @ VE Building
provided by E & J Gallo and Canandaigua

4.5 Continuing Education Hours – Meeting Code A-0802-03

PMA funded by the California Department of Pesticide Regulation,
US Environmental Protection Agency, and California Association
of Winegrape Growers

PROGRAM IN SPANISH (VE)

9:00 am Registration & Refreshments
*refreshments provided by Allied Grape Growers and
Central California Winegrowers*

9:25 am Welcome

Saul Arriola, Canandaigua Wine Company

9:30 am Mealybugs – ID and Discussion
Tarcisio Ruiz, University of California, Berkeley

**10:00 am Glassy-Winged Sharpshooter –
ID and Discussion**
Tarcisio Ruiz, University of California, Berkeley

10:30 am BREAK & Refreshments

10:45 am Sulfur Stewardship and Safety
Martin Montelongo, MGM Ag Consulting

11:45 am Weeds – ID and Discussion
Richard Molinar, UCCE Fresno County

12:45 pm LUNCH @ VE Building
provided by E & J Gallo and Canandaigua

*Certificate of Attendance or 3.5 Continuing Education Hours –
Meeting Code A-0801-03*



RSVP requested by March 26, 2003

Reservation form and campus map available online at
<http://cast.csufresno.edu/ve>

**Taller de la Alianza de Manejo de Plagas en Uvas Para Vino
Programa en Español**

Martes, 1^{ro} de Abril del 2003

Universidad del Estado de California, Fresno – Edificio de Viticultura y Enología (VE)

Presentado por

El Centro de Investigación de Viticultura & Enología y el Departamento de Viticultura & Enología de la Universidad del Estado en Fresno, La vinícola E & J Gallo, Los Productores de Vinos de California Central, La Compañía de Vinos Canandaigua, La Asociación de Productores de Vinos de California y Los Productores de Uva Aliados.

Costo: Gratis incluyendo almuerzo

PROGRAMA (VE)

9:00 a.m. **Inscripción**

9:25 a.m. **Discusión – Programa**

Saul Arriola, La Compañía de Vinos Canandaigua

9:30 a.m. **Identificación y discusión sobre: Los piojos harinosos**

Tarcisio Ruiz, Universidad de California, Berkeley

10:00 a.m. **Identificación y discusión sobre: La chicharrita de alas cristalinas**

Tarcisio Ruiz, Universidad de California, Berkeley

10:30 a.m. **Descanso y café (o Merienda)**

proveido por Los Productores de Uva Aliados y Los Productores de Vinos de California Central

10:45 a.m. **Las mejores prácticas para el uso seguro del azufre**

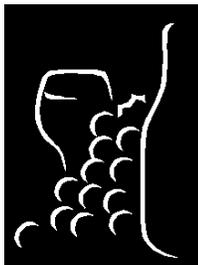
Martin Montelongo, MGM Ag

11:45 a.m. **Identificación y discusión sobre: Malezas**

Richard Molinar, Universidad de California, Fresno

12:45 p.m. **Almuerzo - Edificio VE**

proveido por E & J Gallo y La Compañía de Vinos Canandaigua



**The Lake County Winegrape Commission,
University of California Cooperative Extension,
& the Winegrape Pest Management Alliance**

Present

Irrigation and Weed Management for Sustainable Viticulture

California Winegrape PMA Project
Board of Directors
David Weiss-Chairman
Frank Anderson
Bryan Greer
David Rosenthal
Eric Seely
Clay Shannon
Peter Windrem

Wednesday April 23, 2003

Clear Lake Grange, 1510 Big Valley Rd., Finley

During these tough economic times, we hope you will take advantage of this workshop. Improved irrigation and weed management have the potential to save money and reduce impacts on the environment through reduced water and herbicide use. CE hours have been applied for.

AGENDA

7:30 a.m. Registration Coffee and pastries. Weed samples will be available to begin learning weed Id.

8:00 a.m. Irrigation System Design The design of your drip irrigation system influences how evenly, and hence how efficiently water is applied in your vineyard. **Patrick Stern of North Coast Irrigation** will talk about principles of irrigation system design, including modifications to improve current systems.

8:45 a.m. Irrigation System Maintenance Clogging of your drip irrigation system leads to increased water requirements, reduced distribution uniformity, and uneven vine growth. **Stuart Styles, Director of the Irrigation Training and Research Center at Cal Poly, San Luis Obispo**, will discuss uniformity testing and treatment to prevent clogging.

9:45 a.m. Irrigation Scheduling The amount of irrigation required throughout the season changes based on availability of soil moisture, vine size, day length, and weather conditions. **Terry Prichard, Irrigation Specialist with University of California Cooperative Extension** will present a method for calculating vine water requirement based on weather data. He will also discuss deficit irrigation of winegrapes.

10:45 a.m. Panel Discussion on Irrigation Management

11:00 a.m. Weed Identification and Control The first step to effective weed control is knowing what is there! **Tom Lanini, Weed Ecologist with University of California Cooperative Extension**, will assist growers with weed identification and discuss implications for management.

12:15 p.m. Great Grapes/ Great Wine: Continuing our guest winemaker series, **Dave Crippen of Steele Wines** will present Syrah from two different Lake County vineyards.

12:45 p.m. Lunch

The cost for this workshop is \$15. Your check is your RSVP.

NAME: _____

ADDRESS: _____

**Lake County Winegrape Commission
Irrigation and Weed
Management for Sustainable
Viticulture
April 23, 2003
Clear Lake Grange, Finley**

P.O. Box 877 • Lakeport, CA 95453 • (707) 995-3421 • Fax:(707) 995-3616• www.lakecountywinegrape.org

***The WINEGRAPE PEST MANAGEMENT ALLIANCE Presents:
FREE Grower's Field Day & Workshop***

THURSDAY, APRIL 24, 2003

Robert Mondavi Winery's Wappo Hill Ranch, 5589 Silverado Trail, Napa

Supporters include:

*Nord Coast Vineyard Service, Robert Mondavi Winery, California Association of Winegrape Growers,
Napa Sustainable Winegrowing Group and UC Cooperative Extension*

8:00 am Registration for ENGLISH program (Main Office – 5589 Silverado Trail; end of paved driveway)

9:00 am Registration for SPANISH program (Regusci Barn – Silverado Trail opposite Clos du Val Winery)

PROGRAM IN ENGLISH

8:00 am Registration & Weed ID Activity @Main Office

INDOOR SEMINAR @Main Office

8:30 am Welcome

Joe Browde, Winegrape Pest Management Alliance

8:40 am Sulfur, Mites, and Cost Considerations

Michael Costello, Cal Poly State University

9:10 am Regulated Deficit Irrigation (RDI)

Dale Handley, Handley Irrigation Consultants

9:40 am Grower Panel – RDI Experiences

Zach Berkowitz & Dana Zaccone

10:10 am Weed ID Activity continued...

10:20 am Weed ID and Controls - Discussion

Tom Lanini, UC Cooperative Extension

11:30 am – 12:15 pm FIELD DEMOS @Regusci Barn

Session A - USDA Floor Management Research

Lissa Veilleux and Kendra Baumgartner, USDA

Session B - Soil/Plant Water Monitoring Equipment

Dana Zaccone

FREE LUNCH @Main Office starting 12:30 pm

provided by Nord Coast Vineyard Service

PROGRAM IN SPANISH

9:00 am Registration & Welcome @Regusci Barn

Welcome - Jon Kanagy, Nord Coast Vineyard Service

9:30 – 11:00 am FIELD DEMOS @Regusci Barn

Session A - Weed ID and Controls – Tour & Discussion

Anil Shrestha & Kurt Hembree, UC Cooperative Extension
translation by Juan Cardenas, Nord Coast Vineyard Service

Session B - USDA Floor Management Research

Lissa Veilleux & Kendra Baumgartner, USDA
*translation by Humberto Izquierdo, Napa Co Ag
Commissioner's office*

&

Soil/Plant Water Monitoring Equipment

translation by Jon Kanagy, Nord Coast Vineyard Service

INDOOR SEMINAR @Main Office

11:15 am Sulfur Stewardship and Safety

Remi Cohen, Bouchaine Vineyards

11:45 am Soil/Plant Water Relations

Jon Kanagy, Nord Coast Vineyard Service

12:10 pm Pesticide Laws and Regulations Brief

Humberto Izquierdo, Napa Co. Ag Commissioner's office

FREE LUNCH @Main Office starting 12:30 pm

provided by Nord Coast Vineyard Service

Continuing Education Hours – 3.5 (English Program) & 3.0 (Spanish Program)

The Pest Management Alliance is funded by the California Department of Pesticide Regulation, US Environmental Protection Agency and California Association of Winegrape Growers

Taller de la Alianza de Manejo de Plagas en Uvas Para Vino Programa en Español

jueves, 24 de abril del 2003

Rancho Wappo Hill de Robert Mondavi Winery, 5589 Silverado Trail, Napa

Presentado por

Nord Coast Vineyard Service, Robert Mondavi Winery, La Asociación de Productores de Vinos de California, Napa Sustainable Winegrowing Group y UC Cooperative Extension

Costo: Gratis incluyendo almuerzo

PROGRAMA

9:00 am **Inscripción y Bienvenidos en el Regusci Barn**
Jon Kanagy, Nord Coast Vineyard Service

9:30 – 11:00 am **Demostaciones de Campo en el Regusci Barn**

Sesión A - Identificación y discusión sobre malezas
Anil Shrestha & Kurt Hembree, Universidad de California
traducido por Juan Cardenas, Nord Coast Vineyard Service

Sesión B – Investigaciones en el manejo del zacate, Dept. de Agricultura de los EEUU
Lissa Veilleux y Kendra Baumgartner, USDA
Traducido por Humberto Izquierdo, Dept. de Agricultura del Condado de Napa
Y

Equipo de monitoreo de agua en la planta y el suelo
traducido por Jon Kanagy, Nord Coast Vineyard Service

Presentaciones en la Oficina Principal

11:15 am **Las mejores prácticas para el uso seguro del azufre**
Remi Cohen, Bouchaine Vineyards

11:45 am **El uso del agua por las viñas**
Jon Kanagy, Nord Coast Vineyard Service

12:10 pm **Leyes y regulaciones sobre el uso de pesticidas**
Humberto Izquierdo, *Dept. de Agricultura del Condado de Napa*

ALMUERZO en la Oficina Principal empieza a las 12:30 p.m.
proveido por Nord Coast Vineyard Service

Pest Management Alliance Workshop - April 25, 2003

Holy Ghost Hall, 7960 Mill Station Road, Sebastopol

*Sponsored by the California Association of Winegrape Growers,
Sonoma County Grape Growers Association &
Russian River Valley Winegrowers*

PROGRAM IN ENGLISH

- 8:30 am Registration & Weed ID Activity**
- 9:00 am Welcome - Nick Frey SCGGA & Joe Browde CAWG/PMA**
- 9:15 am Sulfur, Mites, & Cost Considerations - Michael Costello, Cal Poly State Univ**
- 9:45 am Irrigation Management - Dale Handley, Handley Irrigation Consultants**
- 10:30 am Weed ID Activity continued...**
- 10:45 am Weed ID & Management - Tom Lanini, UC Cooperative Extension**

PROGRAM IN SPANISH

- 9:45 am Registration**
- 10:00 am Sulfur Stewardship & Safety - Remi Cohen, Bouchaine Vineyards**
- 10:30 am Mealybugs Identification & Discussion - Rafael Jimenez**
- 11:00 am Highway Safety - Braulio Mendieta, CHP officer**
- 11:30 am Weed Identification & Discussion - Anil Shrestha & Kurt Hembree,
UCCE
*translation by Rafael Jimenez***

NOON BBQ LUNCH prepared by RRVW - \$10 + bring bottle of wine to share

Continuing Education Hours Available

The Pest Management Alliance is funded by the California Department of Pesticide Regulation, US Environmental Protection Agency and California Association of Winegrape Growers

For reservations contact SCGGA at (707) 206-0603 or e-mail: ipm@scgga.org

Taller de la Alianza de Manejo de Plagas en Uvas Para Vino

Programa en Español

jueves, 25 de abril del 2003

Holy Ghost Hall, 7960 Mill Station Road, Sebastopol

*Presentado por
La Asociación de Productores de Vinos de California,
Sonoma County Grape Growers Association &
Russian River Valley Winegrowers*

PROGRAMA

9:45 am Inscripción

10:00 am Las mejores prácticas para el uso seguro del azufre
Remi Cohen, Bouchaine Vineyards

10:30 am Identificación y discusión sobre: Los piojos harinosos
Rafael Jimenez

11:00 am Seguridad en las Carreteras

11:30 am Identificación y discusión sobre: Malezas
Anil Shrestha & Kurt Hembree, Universidad de California
Traducido por Rafael Jimenez

12:00 p.m. Almuerzo preparado por RRVW - \$10

*Certificado de Asistencia en el
Taller de la Alianza de Manejo de Plagas en Uvas Para Vino
Programa en Español*

Martes, 1 de Abril del 2003

Universidad del Estado de California, Fresno – Edificio de Viticultura y Enología (VE)

Certificate of Attendance - Winegrape Pest Management Workshop
Tuesday, April 1, 2003
California State University, Fresno – Viticulture & Enology Building

NAME

Temas: Identificación y discusión sobre: Los piojos harinosos, La chicharrita de alas cristalinas, Malezas
Las mejores prácticas para el uso seguro del azufre

Topics: Identification and Discussion: Mealybugs, Glassy-winged Sharpshooter, Weeds
Sulfur Dust Stewardship and Safety

Presented by
***Fresno State Viticulture & Enology Research Center & Department of Viticulture & Enology,
E & J Gallo Winery, Central California Winegrowers, Canandaigua Wine Company,
California Association of Winegrape Growers, and Allied Grape Growers***

Joe Browde, PMA Coordinator

Date

Community Forum

Sulfur in Vineyards

Community Forum
Tuesday, January 21, 2003
7 to 9 pm
St. Mark's In-the Valley
Episcopal Church
2901 Nojoqui Ave.
Los Olivos

Issue: As the California landscape changes, communities struggle with conflicts between land uses. With both the proliferation of new vineyards and new home sites on the Central Coast, more and more people are becoming concerned about the use of pesticides on farms near residential properties. This forum will provide an opportunity for the public to learn what farmers, environmentalists, neighbors, and local governments are doing to address this issue and voice their own concerns and ideas. The public is strongly encouraged to take this opportunity to interact with people and organizations that have the same desire to make our communities a safe, healthy place for everyone to live now and in the future.

Moderator/Facilitator: Lynn Rodriguez

Panelists:

Joe Browde – Winegrape Pest Management Alliance
Joe Karl – Santa Barbara Co Dep Ag Commissioner
Eric Cardenas – Environmental Defense Center
Jeff Frey – Frey Farming Company
Michael Kaplan – Neighbors At Risk
Jeff Newton – Coastal Vineyard Care Associates
Robert LaVine – Central Coast Vineyard Team

For more information: Please call Victoria LeBlanc at the Central Coast Wine Growers' Association at (805) 928-4950 or Bob Thiel at the Community Environmental Council at (805) 963-0583 ext. 111

**Presented by the Central Coast
Wine Growers' Association – Wine
Industry Task Force**

In association with

Central Coast Vineyard Team

Community Environmental Council

Environmental Defense Center

**Central Coast Environmental
Health Project**

Winegrape Pest Management Alliance

Women's Environmental Watch

Afternoon in the Vineyards

Saturday, May 17, 2003

3:00 - 4:30 p.m.

Vineyards throughout Napa County will be open to the community for Afternoon in the Vineyards on Saturday, May 17, 2003. Drop by the vineyard location (or locations) closest to you during the hours of 3:00 to 4:30 p.m. to meet your vintner and grower neighbors. Learn more about Napa Valley vineyards, winegrape varieties, winemaking, farming practices, and more. Check the vineyard location list below to find a vineyard near you.

Come as you are - the event is free and there is no need to RSVP!

Locations:

Carneros

Host: Ceja Vineyards

1012 Las Amigas Road, Napa

Napa - North

Host: Reynolds Family Winery and Renteria Vineyard Management

3266 Silverado Trail, Napa

Napa - East

Host: Nord Coast Vineyard Services

Vineyard is located at 1135 Monticello Road

Napa- West

Host: Truchard Vineyards

3234 Old Sonoma Road, Napa

Yountville

Host: Napa Wine Company

Vineyard is located at the corner of Yount Mill Road and Yountville Cross Road

Rutherford

Host: Honig Vineyard and Winery

850 Rutherford Road, Rutherford

St. Helena

Host: Franciscan Oakville Estate

1178 Galleron Road, St. Helena

Calistoga - South

Host: Stonegate

1183 Dunaweal Lane, Calistoga

Calistoga - North

Host: Summers Winery

1171 Tubbs Lane, Calistoga

PRINCIPAL INVESTIGATOR

Karen Ross

President, California Association of
Winegrape Growers

PROJECT COORDINATOR

Joe Browde

Private Consultant

STEERING COMMITTEE

Jeff Bitter

Allied Grape Growers

Mike Boer

Mendocino Winegrowers Alliance

Nick Frey

Sonoma County Grape Growers

Patrick Gleeson

American Vineyard Foundation

Jon Holmquist

Canandaigua Wine Company

Rhonda Hood

California North Coast Grape Growers

Steve Kautz

Calaveras Wine Association

Randy Lange, Steve Quashnick

CAWG

David Lucas

Lucas Winery

Kelly Maher, Julie Nord, Katey Taylor

Napa Valley Grape Growers

Kris O'Connor

Central Coast Vineyard Team

Cliff Ohmart

Lodi-Woodbridge Winegrape Commission

Jason Smith

Monterey County Grape Growers

Ken Wilson

Clarksburg Wine Growers

TECHNICAL ADVISORS

Kendra Baumgartner

US Department of Agriculture ARS

Larry Bettiga, Kurt Hembree,

George Leavitt, Mario Moratorio,

Ed Weber

University of California Coop. Extension

Jenny Broome

University of California Sustainable
Agriculture Res. and Educ. Program

Sewell Simmons

Department of Pesticide Regulation

Ann Thrupp

US Environmental Protection Agency

The California Winegrape Pest Management Alliance

**A Partnership between the
California Winegrape Community and the
Department of Pesticide Regulation
to Promote Sustainable Practices**

The California Winegrape Pest Management Alliance (PMA) is a statewide grower-driven collaboration with the Department of Pesticide Regulation (DPR) to promote reduced-risk pest management in winegrapes.

The California Association of Winegrape Growers (CAWG) provides organizational leadership, and a Steering Committee, comprised of representatives from regional and statewide winegrape organizations, guides efforts.

Funding is provided by DPR through its Pest Management Alliance Grants Program. More than 50% of costs are shared by CAWG and through in-kind contributions from regional organizations and growers.

California Winegrape Pest Management Alliance

Phone (707) 776-4943 • Fax (707) 776-4540 • mjbrowde@pacbell.net

California Association of Winegrape Growers

Phone (916) 924-5370 • Fax (916) 924-5374 • info@cawg.org

Investigador Principal

Karen Ross

President, California Association of
Winegrape Growers

Coordinador de Proyecto

Joe Browde

Private Consultant

Comité Guía

Jeff Bitter

Allied Grape Growers

Mike Boer

Mendocino Winegrowers Alliance

Nick Frey

Sonoma County Grape Growers

Patrick Gleeson

American Vineyard Foundation

Jon Holmquist

Canandaigua Wine Company

Rhonda Hood

California North Coast Grape Growers

Steve Kautz

Calaveras Wine Association

Randy Lange, Steve Quashnick

CAWG

David Lucas

Lucas Winery

Kelly Maher, Julie Nord, Katey Taylor

Napa Valley Grape Growers

Kris O'Connor

Central Coast Vineyard Team

Cliff Ohmart

Lodi-Woodbridge Winegrape Commission

Jason Smith

Monterey County Grape Growers

Ken Wilson

Clarksburg Wine Growers

Consultores Técnicos

Kendra Baumgartner

US Department of Agriculture ARS

Larry Bettiga, Kurt Hembree,

George Leavitt, Mario Moratorio,

Ed Weber

University of California Coop. Extension

Jenny Broome

University of California Sustainable

Agriculture Res. and Educ. Program

Sewell Simmons

Department of Pesticide Regulation

Ann Thrupp

US Environmental Protection Agency

Alianza de Control de Pestes en Uvas de Vino de California

**Es una Asociación entre la Comunidad de Uvas
de Vino de California y el Departamento de
Reglamentación de Pesticidas (DPR, por su sigla
en inglés) para Promover Prácticas Sustentables**

La Alianza de Control de Pestes en Uvas de Vino de California (PMA, por su sigla en inglés) es una colaboración guiada por agricultores a través del estado y con el Departamento de Reglamentación de Pesticidas (DPR) para promover control de riesgo reducido de pestes en uvas de vino.

La Asociación de Agricultores de Uvas de Vino (CAWG, por su sigla en inglés), provee liderazgo organizacional. Además, un Comité Guía, compuesto por representantes regionales y de organizaciones de uvas de vino a través del estado, guía los esfuerzos.

Los fondos provienen del DPR a través de su Programa de Alianza de Control de Pestes. Más del 50% de los costos son compartidos por CAWG y por organizaciones regionales y agricultores.

California Winegrape Pest Management Alliance

Phone (707) 776-4943 • Fax (707) 776-4540 • mjbrowde@pacbell.net

California Association of Winegrape Growers

Phone (916) 924-5370 • Fax (916) 924-5374 • info@cawg.org

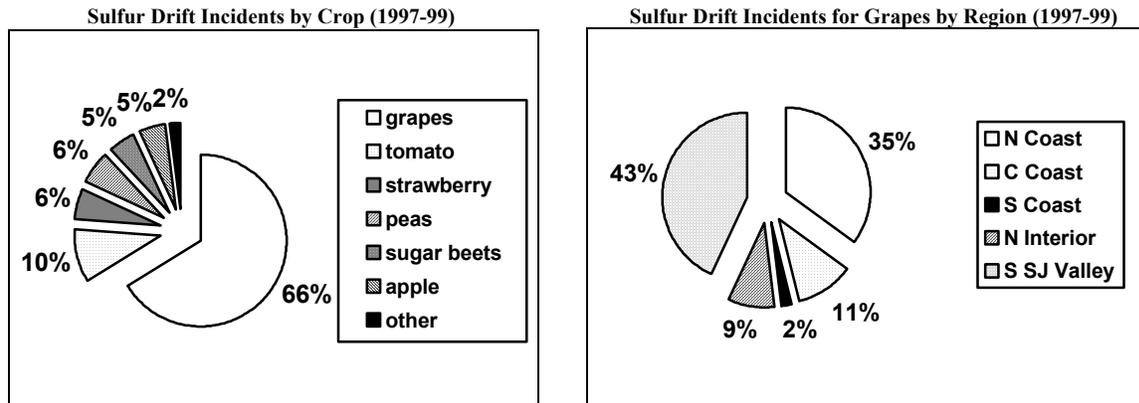
Best Management Practices for Sulfur in Winegrapes

Sulfur is a natural element used safely for centuries to control plant pathogens and mites. As an active ingredient, sulfur is the leading pesticide used in California agriculture. It is an important and effective tool for managing powdery mildew – one of the major diseases affecting grapes throughout the world. Uncontrolled mildew seriously reduces winegrape yields and quality.

Human exposure to sulfur can cause eye and skin irritation and breathing difficulty – especially in sensitive individuals. But, compared to most pesticides, it has minimal effects on humans and the environment. In fact, sulfur use is approved for organic farming.

So, what is the concern?

Reports of sulfur drift have occurred in recent years. A survey by the Department of Pesticide Regulation found 86 reported incidents of sulfur drift during 1997 to June 1999. Two thirds of the reports cited grapes as the target source, distributed throughout all winegrape regions. Moreover, 80% of reports for grapes were attributed to dust applications. Incidents included dust drifting onto surrounding structures, such as neighboring residences, schools, and places of business. Dust drift onto workers in surrounding fields and moving vehicles also was reported.



Dusting sulfur constitutes the foundation for powdery mildew control in grapes throughout California. In fact, a majority of winegrape acres are treated with dusting sulfur each year – many treated repeatedly. However, public complaints of sulfur drift have increased. Why? The key factor seems to be the increase in agricultural/urban interfaces.

Uses of sulfur best management practices will minimize the potential for drift from treated vineyards, especially onto surrounding “sensitive areas”. Dusting sulfur must be managed with particular care because of its high visibility and susceptibility to offsite movement by wind.

What are sensitive areas?

Sensitive areas are locations surrounding vineyards where people, organisms, or structures could be exposed to pesticides. For sulfur, these areas include schools, bus stops, busy roadways, residences, or other areas of human activity. Sulfur sensitive areas also can include nearby crops (such as pears) and waterways.

How to reduce the potential for drift and avoid incidents?

The following practices can be integrated into programs for managing sulfur that achieve mildew control while preventing drift and public complaints. A management plan should be developed incorporating those practices appropriate for each grower’s vineyard and circumstances. Applicators must understand the plan as it relates to the geography of the vineyard and surrounding areas.

Best Management Practices

- *Being a Good Neighbor.* Sulfur stewardship includes being aware of the concerns of neighbors and local communities. Consider a policy of discussing vineyard actions with neighbors, speaking with community organizations about the importance of sulfur as a relatively benign crop protection tool, and forming a regional team of growers to serve as the first contact with the public for negotiations and troubleshooting. These actions enable mutual understandings and better relations, thus decreasing the probability of complaints.
- *Canopy Management.* Use trellis systems and canopy thinning techniques (*e.g.*, leaf pulling, shoot thinning, cane cutting) that open canopies to recommended levels. Besides benefiting fruit quality, a properly opened canopy provides conditions less conducive to mildew and other diseases, potentially enabling use of lower sulfur rates and fewer applications for achieving adequate coverage.
- *Monitoring Mildew Development.* Use the powdery mildew index as a tool for optimally timing and possibly reducing the frequency of fungicide applications (including sulfur).
- *Establishing Buffers.* Establish reasonable buffer zones to prevent drift onto sensitive areas and human exposure to applications. Buffer distances vary with weather conditions, formulation (dust/wettable), application method (ground/air), presence of barriers (*e.g.*, trees), and characteristics of sensitive areas. If buffers determined for dust application overlap some border vine rows, apply separate fungicide sprays (less prone to drift) to these rows or dust border rows during conditions when buffers can be reduced.
- *Dealing with Extra-Sensitive Areas.* Consider applying wettable sulfur or other low-risk fungicide sprays to parts of or entire vineyards near extremely sensitive areas.
- *Selecting Rates.* Adjust rates of sulfur or other fungicides to the lowest effective rate according to vine growth and development. Higher label rates may not be required early in the season to achieve adequate coverage. Use of lower rates decreases risks of pesticide drift, particularly for dusting sulfur.
- *Equipment Operation.* Maintain, calibrate, and select application equipment to deliver the intended rate as accurately and quietly as possible. For dust, be extra cautious of drift during row turns and reduce RPM at row ends or shutoff dusting equipment if possible.
- *Weather Monitoring.* Monitor weather conditions before and during applications. No sulfur applications can be made when winds exceed 10 miles per hour, but consider using an even lower threshold. Avoid applications when winds are blowing towards sensitive areas and during temperature inversions.
- *Timing Applications.* Decrease public visibility and the potential for complaints by making applications during periods of least human activity (*e.g.*, at night, weekends). Develop a sequence for application that attracts the least attention. For nighttime applications, minimize “noise” complaints by treating rows closest to residential areas first.
- *Resistance Management.* Although mildew resistance to sulfur has never been found, consider rotations with other fungicides as a preventive measure against resistance and sulfur drift.

The winegrowing community must be proactive in resolving important environmental and social issues. Addressing the issue of public complaints of sulfur drift is no exception. The greater use of sulfur best management practices should decrease drift incidents, prevent further regulation, and retain sulfur as a viable organic tool for agricultural production.

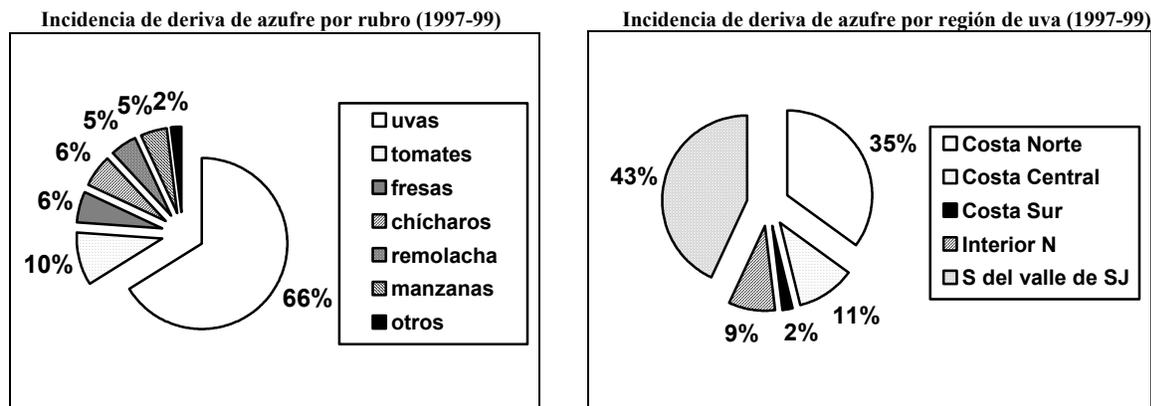
Las Mejores Prácticas Para el Manejo de Azufre en los Viñedos para Vino

El azufre es un elemento que ocurre en la naturaleza y que se ha usado por centenares de años para el control de plagas. El azufre como ingrediente activo es el pesticida de más uso en la agricultura de California. Es un producto efectivo e importante para el control de la cenicienta polvorienta conocida también como mildiú, una de las enfermedades más importantes que ataca a la viña en todo el mundo. La falta de control de mildiú puede causar reducciones importantes de rendimiento y calidad en las uvas para vino.

El ser expuesto al azufre puede ocasionar en el hombre, irritación en los ojos y la piel y dificultades en respirar, especialmente en los individuos sensibles. Pero en comparación con la mayoría de los pesticidas, tiene un efecto mínimo en los seres humanos y en el medio ambiente. De hecho, el uso de azufre está aceptado en la producción orgánica.

¿Entonces, cuál es la inquietud?

En los últimos años han habido denuncias de deriva de azufre hacia los vecinos. Una encuesta hecha por el Departamento de Reglamentación de Pesticidas encontró que de 1997 a Junio de 1999 hubo 86 denuncias de deriva de azufre. En dos tercios de los informes, las aplicaciones estaban dirigidas hacia viñedos. Dichas denuncias estaban distribuidas por todas las regiones de uva para vino. Es más, el 80% de las denuncias hechas en uvas fueron atribuidos a las aplicaciones de azufre en polvo. Los incidentes incluyen la deriva de polvo sobre estructuras adyacentes, como ser residencias, escuelas y negocios vecinos. También se reportó deriva de azufre en polvo sobre trabajadores en campos y vehículos en el vecindario.



Por toda California, el uso de azufre en polvo es la base del manejo de mildiú en uvas. Es más, la mayoría de los acres donde se crece uva para vinos son tratados con azufre en polvo todos los años y muchos son tratados repetidas veces. Sin embargo, han aumentado las quejas del público sobre el arrastre de azufre. ¿Porqué? La razón principal aparenta ser un aumento en la proximidad de la zonas agrícolas a las zonas urbanas.

El uso de las “Mejores Prácticas para el Manejo de Azufre” disminuye el riesgo de que ocurran derivas provenientes de viñedos tratados, especialmente en los alrededores de “áreas sensibles”. La aplicación de azufre en polvo debe de ser manejado con extremo cuidado debido a su alta visibilidad y a la posibilidad de ser movido por el viento fuera del viñedo.

¿Cuáles son las áreas sensibles?

Las áreas delicadas son aquellas localidades adyacentes al viñedo donde gente, animales o estructuras pueden estar expuestas a los pesticidas. En el caso del azufre, estas áreas incluyen escuelas,

paradas de autobús, calles o caminos concurridos, viviendas y otras áreas habitadas por el hombre. Áreas sensibles al azufre también puede incluir cultivos linderos (como ser huertas de peras) y cursos de agua.

¿Cómo se puede reducir el riesgo de arrastres y cómo se puede evitar incidentes?

Las siguientes prácticas pueden ser integradas en el programa para el manejo de azufre obteniendo control de mildiú al mismo tiempo evitando la deriva y las quejas del público. Cada productor debe desarrollar un plan de manejo incorporando las prácticas apropiadas para sus circunstancias. Quienes aplican el azufre deben comprender dicho plan en relación a la topografía del viñedo y las áreas linderas.

Las mejores prácticas de manejo

- (a) *Ser un buen vecino.* La correcta administración del azufre incluye estar al tanto de las inquietudes de los vecinos y las comunidades locales. Platique con sus vecinos de las prácticas que usted efectúa en su viñedo, hable con organizaciones de la comunidad sobre la importancia del azufre como una herramienta relativamente benigna para la protección de los cultivos, y establezca un grupo regional de productores para servir de primer contacto con el público para negociar y solucionar problemas. Estas acciones establecen un entendimiento mutuo y crean mejores relaciones, por lo cual decrecen las posibilidades de recibir quejas.
- (b) *Manejo del follaje.* Use espalderas y técnicas para desahijar (como ser deshojar, desahijar el retoño, podar la caña) para abrir el follaje a niveles recomendados. Además de beneficiar la calidad de la fruta, cuando se abre el follaje correctamente se crean condiciones que son menos propicias al mildiú y otras enfermedades, haciendo posible que se disminuya la cantidad o el número de aplicaciones de azufre y obteniendo una cobertura adecuada.
- (c) *Monitorear el desarrollo de mildiú.* Use el índice desarrollado para mildiú para determinar cuando es el tiempo óptimo para aplicar un fungicida y posiblemente reducir la frecuencia de las aplicaciones de fungicidas (incluyendo el azufre).
- (d) *Establezca zonas de contención.* Establezca zonas razonables de contención en las cuales no se aplica azufre para prevenir la deriva hacia áreas sensibles y para evitar exponer a la gente a la aplicación. Las zonas de contención varían con las condiciones climáticas, la formulación del producto (polvo, soluble), el método de aplicación (por tierra, avión), la presencia de barreras (ej. árboles), y las características de las áreas delicadas. Si la zona de contención abarca algunos surcos a la orilla del viñedo, aplique otro fungicida (uno que no cause deriva) en estos surcos o aplique el polvo bajo aquellas condiciones donde se puede disminuir el tamaño de la zona de contención.
- (e) *En áreas extremadamente sensible.* Considere aplicar azufre mojable u otro fungicida de bajo riesgo a partes o a todo el viñedo que se encuentra cerca de áreas que son extremadamente delicadas.
- (f) *Dosis selectivas.* Ajuste la dosis de azufre u otro fungicida a la dosis efectiva más baja dependiendo del crecimiento y desarrollo de la viña. Temprano en la estación puede que no se requieran dosis altas para obtener una cobertura adecuada. El uso de bajas dosis decrece el riesgo de arrastre de pesticidas, especialmente en el caso de azufre en polvo.
- (g) *Mantenimiento del equipo.* Mantenga, calibre y elija el equipo para aplicar la dosis estipulada con la mejor precisión y con el mayor silencio. Cuando aplique azufre en polvo tome extra precaución para evitar la deriva al doblar el surco y disminuya las revoluciones, o si es posible, apague el equipo al final del surco.
- (h) *Monitoreo de las condiciones meteorológicas.* Monitoree las condiciones climáticas antes y durante la aplicación. No se puede aplicar azufre cuando el viento excede 10 millas por hora, pero considere usar un umbral más bajo. Evite hacer una aplicación cuando el viento va en dirección hacia áreas delicadas o cuando hay una inversión de temperaturas en la atmósfera.
- (i) *Período de aplicación.* Haga las aplicaciones en períodos de menor actividad humana (ej. en la noche o durante el fin de semana) para disminuir la visibilidad al público y la posibilidad de recibir quejas.

Desarrolle un esquema de aplicaciones para no atraer atención. Cuando efectúe aplicaciones durante la noche, comience cerca de las residencias vecinas para evitar tener quejas por el ruido.

- (j) *Manejo de resistencia*. Si bien el mildiú no ha desarrollado resistencia al azufre, considere la rotación con otros fungicidas para prevenir desarrollar resistencia y evitar causar deriva.

La comunidad de productores de uvas para vino debe tomar la iniciativa en resolver problemas sociales y del medio ambiente. Esto incluye tratar de resolver las quejas hechas por el público sobre la deriva de azufre. El mayor uso de las “Mejores Prácticas para el Manejo de Azufre” permitirá lograr menos incidentes de deriva, prevenir más reglamentaciones gubernamentales y permitir la retención del azufre como un instrumento orgánico viable en la producción agrícola.

Producido por la Alianza de Control de Plagas en Uvas de Vino de California, una asociación entre la comunidad de Productores de Vinos de California y el Departamento de Reglamentación de Pesticidas (DRP). Los fondos fueron proporcionados por DRP.

Traducido por Lucia G. Varela, **Universidad de California**.

*Instructors Guide***Sulfur Dust Stewardship and Safety**

- **Learning Objectives**

On completing this module, participants will understand:

1. Why sulfur dust drift is an important issue
2. What are sulfur-sensitive areas
3. How to avoid sulfur drift to sensitive areas and public complaints
4. How to safely handle and apply sulfur dust
5. The safe operation of dusting equipment.

- **Equipment and Props for Hands-On Training**

- Display with charts of sulfur drift incidents
- Schematics of vineyards near sensitive areas (e.g., school, houses, busy road)
- Wind gauge
- Long-sleeved shirts
- Long pants
- Waterproof gloves
- Shoes plus socks
- Protective eyewear
- Display with photos of old and new dusting equipment

- **Handouts**

- *Best Management Practices for Sulfur in Winegrapes* (California Winegrape Pest Management Alliance)
- *Sulfur Best Application Practices* (Coalition for Urban/Rural Environmental Stewardship)
- Product Label and Material Safety Data Sheet for sulfur dust
- Photos of safety stickers on dusters
- Photos showing don'ts like putting bare hand into hopper with no shields

Instruction Outline

1. Introduction (2 minutes)

Introduce yourself and tell students the learning objectives:

- To understand why sulfur dust drift is an important issue
- To identify sulfur-sensitive areas and ways to avoid sulfur drift and public complaints
- To review the safe handling and application of sulfur dust and safe operation of dusting equipment.

Explain that the format here differs from other sessions in that various aspects of sulfur dust use and safety will be covered – stewardship, personal protective equipment (PPE), human and environmental hazards, and loading and applying.

2. Sulfur Dust Drift is an Important Issue (5 minutes)

Discussion – Drift Incidents: Show the display with charts from *Best Management Practices for Sulfur in Winegrapes*. Tell students that information is for incidents of sulfur drift in California during 1997-1999. Ask what the important points are:

- Most incidents of sulfur drift resulted from applications to grapes
- Sulfur drift incidents occur all over California (it’s a statewide problem).

Emphasize that sulfur drift incidents have increased and that 80% are for dust. Ask why incidents have increased and so many involve dust.

- Less distance between farms and urban areas, leading to more drift complaints
- Cheap and effective sulfur dust is the most widely used fungicide on grapes (controls powdery mildew, the most important grape pest)
- Sulfur dust is easily visible and very susceptible to drift

Emphasize that sulfur dust drift is the #1 pesticide complaint and that incidents must be reduced. If not, sulfur products (especially dust) could be further regulated or banned.

3. Minimizing Drift and Public Complaints (20 minutes)

Discussion – Identify Sensitive Areas: Emphasize that it is important to first identify areas near fields where drift could cause complaints. It is important to be especially careful in managing sulfur dust near these areas. Ask students to list some “sensitive areas” and describe what makes them sensitive (human activity).

- Schools
- Bus stops
- Busy roadways
- Homes or occupied buildings

Note that sulfur-sensitive areas include nearby susceptible crops and waterways.

Discussion – Stewardship: Ask students what factors can be managed to minimize sulfur drift and public complaints. Discuss the following 10 factors from *Best Management Practices for Sulfur in Winegrapes*. Emphasize factors that students can influence.

- **Being a good neighbor.** Be aware of neighbor concerns and improve communications and understandings with them. Ask students how to deal with an angry neighbor about sulfur drift (stop the application and call the boss).
- **Canopy management.** By properly managing and thinning the canopy, it may be possible to use lower rates and fewer applications.
- **Monitoring mildew development.** Using the powdery mildew index to help time applications may reduce the frequency of applications (briefly explain the index).
- **Establishing buffers.** Set buffers to prevent sulfur drift to sensitive areas.
- **Dealing with extra-sensitive areas.** Consider applying sprays in these situations.
- **Selecting rates.** Use lowest effective rates based on vine growth.
- **Equipment operation.** Maintain and calibrate equipment to deliver the intended rate accurately and quietly. Shutoff dusting equipment at row ends if possible.
- **Weather monitoring.** Monitor weather before and during applications. Do not apply sulfur when winds exceed 10 miles per hour, although a minimum air movement of 2 miles per hour is recommended. Avoid applications when winds are blowing towards sensitive areas.
- **Timing applications.** Decrease public visibility by making applications at night or during other periods of minimal human activity.
- **Resistance management.** Consider rotating sulfur with other fungicides.

Problem-Solving Exercise: Show students the schematics of vineyards near sensitive areas. Ask what can be done to minimize sulfur drift and complaints. Or, divide students into groups, give each group one schematic, and have groups discuss and present tactics. (e.g., nighttime applications, monitoring and adjusting for winds, shutting off at row ends, not dusting vines nearest sensitive areas, and using sprays instead of dust)

Discuss ways to estimate wind speed. Display a wind gauge. Note who is responsible for monitoring winds (the applicator is).

4. Worker and Environmental Safety – Sulfur Dust Label (10 minutes)

Emphasize that the label is the legal document for safety and use information. For this section, have students find appropriate information on the label.

Discussion – Signal Word and PPE: Have students identify the signal word and discuss its meaning (CAUTION: slightly toxic or relatively non-toxic, low hazard). Ask students to determine PPE required for handlers and applicators:

- Long-sleeved shirt
- Long pants
- Waterproof gloves
- Shoes plus socks
- Protective eyewear; safety goggles or glasses with side shields and brow protection.

Discussion – Hazards to Humans and Animals: Ask about these hazards:

- Causes moderate eye, skin, and throat irritation
- May cause breathing difficulty
- Harmful if absorbed through skin.

Emphasize the importance of starting each work day with clean PPE and clothing. Remind students to wash before eating, drinking, smoking, or using the toilet.

Discussion – Environmental Hazards: Ask if sulfur dust is a hazard to the environment. (Although not a serious environmental hazard, spills and drift must be avoided.)

Discussion – Physical Hazard: Ask if sulfur dust suspended in air presents risks. (It ignites easily – avoid heat, sparks, or flame. Do not smoke while applying.)

Discussion – Restricted Entry Interval: Ask what the restricted entry interval is. (Do not enter treated areas for 24 hours after application – becomes 3 days for San Joaquin County after May 15, 2001. For earlier entry, appropriate PPE is required.)

Discussion – Application Precautions: Ask:

- Why sulfur should not be applied in the early afternoon during 100°F temperatures? (At high temperatures, sulfur can burn foliage/fruit. Also, sulfur dust is flammable – tractor, hopper, vines could ignite.)
- Why sulfur should not be applied within 2 weeks of an oil spray (burn foliage/fruit)?
- What are some sulfur-sensitive crops and what precautions should be taken when applying sulfur near them (same as that for other sensitive areas)?

Discussion – Storage and Disposal: Ask how and when to dispose of sulfur bags.

- Empty bags can be burned on site. San Joaquin County ordinance states that sulfur bags must be burned on the day emptied. AVOID smoke – it is toxic.
- Empty bags can be taken to an approved waste disposal facility.
- Store dust in original container only and keep sealed. Store in closed storage areas.

5. Worker Safety – Sulfur Dusters (5 minutes)

Discussion – Safe Operation of Dusting Equipment: Present display with photos of old (three-point model) and new (tow-behind model) dusters. Have students discuss important aspects about safety. Discussion can include:

- Proper and improper protective shields for belts, fan, and mixing shaft.
- The importance of safety decals (note the 5 decals on the new duster).
- How to properly remove a bag caught in the mixing shaft (contrast to photo – rubber gloves must be worn and the mixing shaft turned off).
- The importance of shutting off the tractor engine and allowing all movement to stop before leaving the tractor to adjust, lubricate, or unhook the duster.
- Why hands and loose clothing must be kept away from power-driven parts.
- Why all guards should be in good condition and firmly in place.
- The benefits of the step on the side of the new duster (enables easy and safe pouring).
- Where to stand when adding sulfur (to the side with the wind blowing away).
- The benefits of the storage box on the front of the new duster (stores extra bags).
- The benefit of being able to shut off the flow of sulfur while driving the tractor (note sulfur distribution lever on new duster).
- Stopping the application if the applicator is excessively tired or his vision is obscured.
- Use common sense when operating dusters and refer to equipment manuals.

6. Wrap-Up and Conclusion (3 minutes)

Remind students about carefully managing sulfur to prevent drift problems. Ask students if they have questions on sulfur stewardship or worker safety. In conclusion, point out that each person can make a difference with safely using sulfur.

Guía para Instructores

Buenas Prácticas y Uso Seguro de Azufre en Polvo

- **Objetivos de Aprendizaje**

Al completar este ejercicio los participantes comprenderán:

1. Porqué el tema de la deriva de azufre en polvo es importante
2. Cuales son las áreas ‘delicadas’ o sensibles al azufre
3. Como evitar la deriva de azufre a áreas sensibles y como evitar quejas hechas por el público
4. Como manejar y aplicar con seguridad azufre en polvo .
5. Como manejar con seguridad el equipo para aplicar azufre.

- **Equipos y Materiales Necesarios para el Entrenamiento Práctico**

- Carteles con gráficos de incidentes de deriva de azufre
- Esquemas de viñedos cerca de áreas delicadas (ej. Escuelas, casas, caminos concurridos)
- Medidor de viento
- Camisas de mangas largas
- Pantalones largos
- Guantes impermeables
- Zapatos y medias
- Gafas protectoras
- Carteles con fotos de pulverizadoras nuevas y antiguas

- **Notas**

- *Las Mejores Prácticas para el Manejo de Azufre en los Viñedos para Vino* (Alianza de Control de Plagas en Uvas para Vino de California)
- *Azufre La Mejor Forma de Aplicar* (Coalición Urbana/Rural para la protección del medio ambiente).
- Etiqueta y Hoja de Datos de Seguridad sobre Materiales (MSDS en inglés) de azufre en polvo.
- Fotos de pegotines de seguridad para la pulverizadora.
- Fotos de cosas a evitar; por ejemplo no poner la mano en una tolva que carece de protección.

Programa Educativo

1. Introducción (2 minutos)

Preséntese e infórmeles a los participantes los objetivos de aprendizaje:

- Comprender porque es tan importante el tema de la deriva de azufre.
- Identificar las áreas sensibles al azufre en polvo, y las maneras de evitar la deriva de azufre y las quejas del público.
- Repasar el uso y la aplicación segura de azufre en polvo y el manejo seguro de pulverizadoras.

Explique que la estructura de esta sesión es diferente al resto. Se va a cubrir varios aspectos del uso y la seguridad de azufre en polvo – buenas prácticas, equipo de protección personal (PPE en inglés), riesgos para los humanos y el medio ambiente, carga y aplicación.

2. La deriva de azufre en polvo es un tema importante (5 minutos)

Discusión – de Incidentes de Deriva de Azufre: Muestre el cartel con los gráficos del folleto “*Las Mejores Prácticas para el Manejo de Azufre en los Viñedos para vino*”. Explique a los estudiantes que esta información fue obtenida de incidentes de deriva en California durante 1997 a 1999. Pregunte cuales son los puntos importantes:

- La mayoría de los incidentes de deriva de azufre son debido a aplicaciones hechas a los viñedos.
- Los incidentes de deriva de azufre ocurren en toda California (es un problema Estatal).

Recalque que los incidentes de deriva de azufre han aumentado y que el 80% son debido al azufre en polvo. Pregunte ¿porqué han aumentado los incidentes y porqué tantos son debido al azufre en polvo?

1. Hay menos distancia entre los viñedos y las zonas urbanas, lo cual causa más quejas de deriva.
2. El uso de azufre es barato y efectivo por lo cual es el fungicida más ampliamente usado en los viñedos (controla la cenicienta polvorienta o mildiu, una de las plagas más importantes en la uva).
3. El azufre en polvo es fácilmente visible y se mueve fácilmente en la corriente de aire.

Recalque que la deriva de azufre en polvo es la queja No. 1 en cuanto se refiere a insecticidas y que se debe reducir estos incidentes. Sino, los productos hechos con azufre (especialmente el azufre en polvo) van a ser reglamentados más estrictamente o van a ser prohibidos.

3. Maneras de minimizar la deriva de azufre y las quejas del público (20 minutos)

Discusión – Identificación de Áreas Sensibles: Acentúe que primero es importante identificar aquellas áreas en el campo donde los incidente de deriva pueden resultar en quejas hechas por el público. Es importante tener extremado cuidado en el manejo de azufre cerca de estas áreas. Pídale a los estudiantes que hagan una lista de las ‘áreas sensibles’ y que describan porque estas son áreas delicadas (debido a actividad humana).

- ◆Escuelas ◆Paradas de autobus ◆Caminos concurridos ◆Viviendas o edificios ocupados

Tome nota que las áreas sensibles al azufre también incluyen cultivos susceptibles y cursos de agua.

Discusión – Buenas Prácticas: Pregunte a los estudiantes cuales son algunos de los factores que pueden ser manejados para minimizar la deriva de azufre y las quejas del público. Discuta los siguientes 10 componentes del folleto “*Las Mejores Prácticas para el Manejo de Azufre en los Viñedos para Vino*”. Acentúe aquellos factores que los estudiantes pueden influenciar.

- **Ser un buen vecino.** Tomar conciencia de las inquietudes que tienen los vecinos y mejorar la comunicación y el entendimiento con ellos. Pregunte a los estudiantes que es lo que ellos harían si fueran enfrentados por un vecino enojado debido a la deriva de azufre (suspender la aplicación y llamar a su jefe).
- **Manejo del follaje.** Manejando y raleando el follaje correctamente se puede reducir la cantidad o el número de aplicaciones de fungicidas.
- **Monitorear el desarrollo del mildiú.** El uso del índice desarrollado para el mildiú ayuda a determinar cuando es el tiempo óptimo para la aplicación de un fungicida y puede reducir la frecuencia de las aplicaciones. (Explique que es el índice de Mildeu).
- **Establezca zonas de contención.** Establezca zonas de contención en las cuales no se fumiga para prevenir la deriva de azufre hacia áreas sensibles.
- **Manejo de áreas extremadamente sensible.** Considere aplicar azufre mojable en esta situación.
- **Dosis selectivas.** Use la dosis efectiva más baja dependiendo del crecimiento de la viña.
- **Mantenimiento del equipo.** Mantenga y calibre el equipo para aplicar la dosis estipulada con precisión y en silencio. Si es posible, apague la pulverizadora al final del surco.
- **Monitoreo de las condiciones meteorológicas.** Monitoree las condiciones climáticas antes y durante la aplicación,. No aplique azufre en polvo cuando el viento excede 10 millas por hora, a su vez el viento mínimo recomendado para una aplicación son 2 millas por hora. Evite hacer una aplicación cuando el viento va en dirección hacia áreas delicadas.
- **Período de aplicación.** Disminuya la visibilidad al público haciendo la aplicación durante la noche o en períodos de menor actividad humana.
- **Manejo de resistencia.** Considere la rotación con otros fungicidas.

Ejercicio para resolver problemas: Muestre a los estudiantes un diagrama de un viñedo con áreas sensibles. Pregunte que es lo que ellos harían para minimizar derivas de azufre y quejas. Alternativamente, divida a los estudiantes en grupos, entregue a cada grupo un esquema y haga que el grupo discuta y presente estrategias. (ej. aplicaciones durante la noche, monitorear y tomar precauciones contra el viento, apagar el equipo al final del surco, no aplicar polvo a viñas cerca de áreas sensibles, y el uso de azufre mojable en vez de polvo).

Discuta maneras de medir la velocidad del viento. Muestre un medidor de viento. Indique quien es responsable de monitorear la velocidad del viento(quien aplica es responsable).

4. La etiqueta de azufre en polvo para la seguridad del trabajador y el medio ambiente (10 minutos)

Acentúe que la etiqueta es el documento legal que contiene la información de seguridad y uso. En esta sección pídale a los estudiantes que busquen la información apropiada en la etiqueta.

Discusión – Palabras de Señal y Equipo de Protección Personal: Pídale a los estudiantes que identifiquen las palabras de señal y su significado. (“Caution” o precaución: levemente tóxico o relativamente no tóxico). Luego, pida a los estudiantes que determinen cual es el equipo de protección personal requerido para quienes manejan y aplican azufre.

- Camisas de mangas largas
- Pantalones largos
- Guantes impermeables
- Zapatos y medias
- Protección para los ojos; gafas o anteojeras con protección sobre las cejas y los costados.

Discusión – Riesgos a los seres humanos y animales: Pregunte sobre estos riesgos:

- Causa moderada irritación en los ojos, piel y garganta
- Puede causar problemas de respiración.
- Puede ser nocivo si es absorbido a través de la piel.

Acentúe la importancia de comenzar cada día de trabajo con la ropa y el equipo de protección personal limpio. Haga recordar que deben lavarse antes de comer, beber, fumar o usar el baño.

Discusión – Riesgos al Medio Ambiente: Pregunte si el azufre en polvo es un riesgo para el medio ambiente. (Aunque no es un gran riesgo para el medio ambiente, los derrames y fugas deben ser evitados).

Discusión – Peligros físicos: Pregúntele si el azufre suspendido en el aire puede causar riesgos. (Puede encenderse con facilidad - evite fuentes de calor, chispas o llamas. No fume durante la aplicación).

Discusión – Intervalo de entrada restringida: Pregúntele cual es el intervalo de entrada restringida para azufre en polvo. (No se puede entrar a una área tratada por 24 horas después de hecha la aplicación – esto aumenta a 3 días en el condado de San Joaquín, a partir del 15 de Mayo. Si es necesario entrar durante este intervalo se debe poner el equipo de protección personal apropiado).

Discusión – Precauciones a tomar durante la aplicación: Pregunte:

- ¿Porqué no se debe aplicar azufre después del medio día cuando las temperaturas son de más de 100°F? (A altas temperaturas el azufre puede quemar el follaje y la fruta. Además, el azufre en polvo es combustible –puede encender tractores, tolva, viñas).
- ¿Porqué no se debe aplicar azufre por dos semanas antes o después de una aplicación de aceite (se quema el follaje/fruta)?
- ¿Cuales son algunos cultivos sensibles al azufre y que precauciones se deben tomar cuando se hace una aplicación en su cercanía (las mismas que en otras áreas sensibles)?

Discusión – Almacenaje y deshecho: Pregunte a los estudiantes donde y cuando se deben desechar las bolsas de azufre en polvo.

- Las bolsas vacías se pueden quemar en el lugar de la aplicación. Las reglamentaciones del condado de San Joaquín requieren que las bolsas vacías sean quemadas el día que fueron usadas. EVITE el humo – es tóxico.
- Las bolsas vacías pueden ser llevadas a lugares de despojo autorizados.
- Almacene el azufre en polvo solamente en el envase original y manténgalo sellado. Almacene el azufre en una área cerrada bajo llave.

5. Seguridad del trabajador – Pulverizadoras (5 minutos)

Discusión – Manejo seguro del equipo para la aplicación de azufre en polvo: Muestre las fotos de pulverizadora antiguas (modelos de tres puntos) y pulverizadores nuevas (modelo de remolque). Pidale a los estudiantes que discutan aspectos importantes de seguridad. La discusión puede incluir:

- Escudos protectores apropiados y no apropiados para las correas, ventiladores y el eje de mezclar (batidor).
- La importancia de las calcomanías (pegotines) que tratan de la seguridad (indique las 5 calcomanías que tienen los modelos nuevos).
- Como remover apropiadamente una bolsa atrapada en el batidor (compare con la foto – deben usar guantes de goma y el batidor debe estar apagado).
- La importancia de apagar el motor del tractor y asegurarse de que todo movimiento cese antes de dejar el tractor para ajustar, lubricar o desenganchar la pulverizadora.
- ¿Porqué las manos y todo tipo de ropa suelta deben permanecer fuera del alcance de cualquier parte motorizada de la máquina?
- ¿Porqué todos los protectores tienen que estar en buenas condiciones y firmemente en su lugar?
- Mencione la ventaja que tienen las pulverizadoras nuevas al tener escalones al costado (se efectúa la carga con más facilidad y mayor seguridad).
- Donde se deben parar cuando cargan el azufre (al costado con el viento en dirección opuesta).
- La ventaja de tener una caja de almacenamiento en la parte delantera de las nuevas pulverizadoras (puede guardar bolsas de azufre extras)
- La ventaja de poder apagar el flujo de azufre cuando esta manejando el tractor (muestre la palanca de distribución en los modelos nuevos).
- Suspender la aplicación si el conductor está demasiado cansado o si no tiene adecuada visibilidad.
- Use sentido común cuando maneje una pulverizadora y consulte el manual del equipo.

6. Conclusiones y finalización (3 minutos)

Recuerde a los estudiantes sobre el manejo cuidadoso de azufre para prevenir problemas de deriva. Pregunte si tienen alguna pregunta sobre las buenas prácticas para el uso de azufre o la seguridad del trabajador. Para concluir, recalque que cada persona puede hacer la diferencia si usa el azufre con cuidado.

Traducido por Lucia G. Varela, **Universidad de California**

Practical Neighbor and Community Relations

Often most neighbor-vineyard problems arise from lack of knowledge about what is occurring in the vineyard. Meeting with your neighbors can help alleviate problems in the future.

1. **Communication.** Make sure neighbors know how to contact you. Pass out business cards to neighbors, post your telephone number at vineyard entrance.
2. **Information.** People want to know what, how, why and when things are happening in the vineyard. They are usually concerned about perceived health risks from pesticide drift, and the inconvenience from dust and noise.

People appreciate it if you explain some of the reasoning behind your pesticide decision-making. Before you meet with neighbors at their house or in the field, know the answers to the following types of questions for the pesticides you are using. Neighbors appreciate knowing there is reasoning behind your pesticide usage.

Here's a sample scenario for an application of sulfur dust to prevent powdery mildew.

	Question	Answer
What?	Is being applied?	Sulfur dust. Sulfur is approved for use on organic vineyards.
Why?	Is it applied?	Sulfur helps prevent powdery mildew on the grapes.
How?	Will it be applied?	It is applied with a dusting machine pulled behind the tractor. We have bought a special machine that can be turned off as the tractor drives around the vine rows.
When?	Will it be applied?	The first application is usually in April, and will occur every 10-14 days through June. A powdery mildew index based upon the weather is used to determine scheduling. The dusting occurs at night because the wind is less likely to be blowing.

Here's a sample scenario for an application of Provado to reduce sharpshooters.

	Question	Answer
What?	Is being applied?	Provado, at less than 1 oz per acre.
Why?	Is it applied?	We monitored sharpshooter counts with the yellow sticky traps you see. When they start flying in the spring, we spray Provado to prevent them from spreading Pierce's Disease.
How?	Will it be applied?	It is applied with an electrostatic spray machine. The machine charges the particles, so they spray adheres better to the leaves of the grapevine.
When?	Will it be applied?	The first application is in the spring, with another possible in July. It is usually applied in the early morning.

Let neighbors know plans can change according to weather. If it is too windy, an application may be delayed. Rain and heat can also change schedules.

Outreach

Introduce yourself to new neighbors as they move in. If there are many neighbors surrounding your property you may wish to invite them out to the field.

Field Day Suggestions

1. Give a personal invitation to closest neighbors, hand them a flyer yourself.
2. Invite community leaders, including teachers, supervisors, and council members.
3. Post flyers at local stores.
4. Inform newspapers of your meeting.
5. Invite someone from the Ag Commissioners office. They can help talk to the neighbors if you would like.
6. Offer an incentive. Food or wine made from your vineyard works great.
7. Hand out business cards at your meeting.
8. Review pesticide practices, and the seasonal nature of vineyard work.
9. Have neighbors meet your field manager and some workers.
10. Be kid friendly, have some tractors and equipment for kids to look at.

Follow Up

1. **Respond.** If someone calls with a complaint, make sure to return that phone call within a day. Often, people just want to hear an apology if you happened to make a mistake.
2. **Accommodate simple requests.** Try to work on a compromise if a neighbor has a reasonable request. Maybe you can start dusting their side of the field first during the late evening. You may wish to notify neighbors when sulfur dusting will occur. Don't make promises you can't keep. If you can't meet a request, just let the neighbor know it is not possible.
3. **Lower noise levels.** Often people are more disturbed by noise than the actual spraying.
 - a. Limit the number of tractors in one field at a time.
 - b. Test new equipment for noise levels before you buy it.
 - c. Keep equipment running properly.
 - d. Have employees park cars away from houses and talk quietly during nights.
 - e. Fill equipment tanks away from neighborhoods.

Benefits

1. You will be called first, instead of a complaint to the Ag Commissioner or police department.
2. Neighbors will watch out for your vineyard. If a pipe breaks they will often call to let you know.
3. People are generally proud to live next to a vineyard. They will often buy and serve guests wine that came from your vineyard.
4. Cooperation might improve with the neighbors. They may consult you for Pierce's Disease resistant plants to put in their yard. You might let them use your vineyard access to assist in backyard landscaping projects.

Pest Management Workshop Set For FSU

Grape Grower Magazine – March 2003

The third annual Winegrape Pest Management Alliance Workshop will be held Tuesday, April 1 from 8 a.m. to 2 p.m. at California State University, Fresno. This valleywide event will feature concurrent programs in English and Spanish.

The program is designed for growers, pest control advisors, vineyard foremen and workers, and includes a free lunch provided by E & J Gallo Winery and Canandaigua Wine Company.

The program topics that will be covered in English will include:

1. Advances in understanding and managing powdery mildew
2. Identifying and managing vine mealy bugs
3. Air quality issues and agriculture in the San Joaquin Valley
4. Sulfur, mites and economics
5. Practical and economical weed management
6. Information on the code of sustainable wine growing practices.

Program topics for the Spanish-speaking program will include:

1. Sulfur stewardship
2. Safety issues
3. Key information related to grape pest identification and management.

An interactive activity and discussion on weed identification is planned for both programs.

“Growers will want to consider the benefits of sending their Spanish-speaking employees to this event,” said Joe Browde, statewide project coordinator for the Winegrape Pest Management Alliance. Attendees will receive a certificate of attendance at the completion of the program.

Scheduled speakers include Manuel Cunha (Nisei Farmer’s League); Kent Danne (University of California Kearney Agricultural Center); Steve Schaefer (grower and chairman of the California Association of Winegrape Growers); Gary Grove (Washington State University); Joe Browde (Pest Management Alliance); Mike Costello (Cal Poly San Luis Obispo); and Kurt Hembree (University of California Cooperative Extension, Fresno County).

This event is sponsored by the California Association of Winegrape Growers, Central California Winegrowers Association, Allied Grape Growers, E & J Gallo Winery, Canandaigua Wine Company and the Fresno State Viticulture and Enology Research Center and Department of Viticulture and Enology.

Registration for the English-speaking program will begin at 8 a.m. in the Satellite Student Union on campus (2485 E. San Ramon Ave.). Registration for the Spanish-speaking program will begin at 9 a.m. at the Viticulture and Enology Research Center and Department of Viticulture and Enology (2360 E. Barstow Ave.). Both seminars will conclude with lunch. The reservation deadline is March 24. Late registrations and walk-ins will be accepted as space permits.

The Winegrape Pest Management Alliance – Reflection and Future

*By Joe Browde, Project Coordinator
California Winegrape Pest Management Alliance*

California Grower – January 2003

The California Winegrape Pest Management Alliance recently completed a second year of its multifaceted educational program serving both agricultural and non-agricultural communities. This proactive effort is enhancing the adoption of reduced-risk pest management while improving understandings and relationships among growers, their employees, and surrounding neighbors.

The Alliance is a grower-driven partnership with the Department of Pesticide Regulation (DPR) and the United States Environmental Protection Agency (US EPA). The California Association of Winegrape Growers (CAWG) provides organizational leadership and a prestigious and diverse management team guides efforts. Representatives of grower organizations, wineries, UC Cooperative Extension, UC Sustainable Agricultural Research and Education Program, USDA-ARS, DPR, and US EPA Region 9 constitute the management team. Karen Ross, president of CAWG, is the principal investigator and Joe Browde is the project coordinator. Funding is provided by DPR and EPA grants, CAWG, regional grower organizations, and wineries.

Objectives

The Alliance has the statewide mission to promote pest management practices that minimize the potential for environmental and human harm while maintaining the economic viability of production. A specific goal is to educate the winegrowing community about means to reduce drift incidents for sulfur and limit uses of higher-risk herbicides classified as groundwater contaminants or priority I materials by the 1996 Food Quality Protection Act. For grapes, higher-risk herbicides include simazine (Princep), diuron (Karmex), norflurazon (Solicam), oryzalin (Surflan), oxyfluorfen (Goal), and paraquat (Gramoxone).

Although targeting sulfur and weed management, Alliance demonstration and outreach efforts characterize how practices for managing these two targets affect and can be beneficially integrated with other components of whole farming systems. Emphasis is placed on applying reduced-risk approaches for managing sulfur and weeds as models for dealing with other pest-related problems.

A separate but related goal is to enlighten the general public to the challenges faced by winegrowers and their commitment to taking safe, effective management actions. Productive interaction between agricultural and non-agricultural communities is crucial for sustaining viticulture in an ever-changing landscape and society.

Achievements

Over the course of two years, vast numbers of growers, pest control advisors (PCAs), vineyard foremen and workers, and members of the general public have been educated through field days, workshops, seminars, worker training programs, and written outreach. Nearly 1000 growers and PCAs across the state were educated at field days during the first year alone! Second-year results were more impressive as work was expanded to include significant programs for foremen and workers, the general public, as well as growers and PCAs. Totals of 390 growers and PCAs, 1158 vineyard foremen and workers, and 355 members of the general public were educated through 28 Alliance sponsored or cosponsored events.

Events included presentations by growers, PCAs, vineyard foremen, extensionists, researchers, and county regulators. Key topics for grower and PCA audiences were specific reduced-risk tactics and strategies for managing sulfur and weeds, the integration of sulfur and weed management into whole farming systems, relevant laws and regulations, safe and successful farming at the urban interface, and field demonstrations of management practices and results and equipment. Foremen and workers predominantly were trained on sulfur best management practices in both Spanish and English. The general public was educated about the basics of winegrape production, that most growers care and act to minimize risks, and about the Alliance and other statewide and regional programs in sustainable winegrowing.

Especially noteworthy achievements during year two were the development and implementation of a worker training module on sulfur stewardship and safety and the establishment of both the Spanish Viticulture Technical Group and Vineyard Open House Program in Napa.

Next Steps

The Alliance is envisioned as a multiple-year project, with significant achievements expected as a result of repetition and expansion of effort over time. Clearly, this approach has been successful. Attendance at events has been excellent. Results from questionnaires distributed at workshops confirm that attendees enjoy the presentations and demonstrations and find them useful. Moreover, a survey of North Coast growers documents that most have been exposed to the Alliance and its teachings, and have altered or will alter pest management practices as a result.

The plan for year three is to intensify and expand efforts for three key audiences – growers and PCAs, vineyard foremen and workers, and the general public. Innovative demonstration and outreach will continue to be used as a basis for instruction of reduced-risk pest management, with a continued emphasis on practices pertinent to sulfur and weeds. Activities will include more detailed characterizations of the components of integrated powdery mildew and weed management systems. A key topic will be the stepwise development of cost-effective, under-the-vine weed management programs using demonstration vineyards. Planned elements include identifying and monitoring weeds, determining the management strategy, comparing and selecting tactics, and implementing and assessing the program over time. For public education, the intent is to expand activities into new geographical areas, especially those with increasing agricultural-urban interfaces.

By intensifying and expanding its effort, the Alliance expects to achieve marked reductions in sulfur drift incidents and uses of higher-risk herbicides. Direct measures of reductions in risk are being made by analyzing regional changes in reports of sulfur drift and pesticide uses.

Alliance activities have advanced concepts and application of reduced-risk pest management for winegrapes across the state by complementing regional programs and providing inter-regional sharing of information. The synergy resulting from educating the three key groups described here will continue to reduce real and perceived risks from pesticides and improve inter-group understandings and relationships. Efforts by the Alliance continue to help position winegrape growers as leaders in sustainable agriculture.

Winegrape PMA Leads Off Seminar Series

By Janice Cooper

The Crush – December 2002

The Department of Pesticide Regulation (DPR) is holding a series of seminars featuring different Pest Management Alliance (PMA) programs and issues. PMAs are statewide projects, supported by DPR, to demonstrate and increase adoption of reduced risk practices. The Winegrape PMA led off the series in early December with a seminar focused on “Sulfur Best Management Practices.”

The seminars’ purpose is to provide information on key issues to other DPR branches, county agricultural commissioners, and industry representatives,” Bob Elliott of DPR said. “This seminar provided an overview of the Winegrape PMA’s programs and best practices that minimize impact of sulfur use on environmental and human health without creating a major economic impact on the winegrape industry.”

Joe Browde, Project Coordinator of the Winegrape PMA, said “The seminar provided a great opportunity for grape growers to interact directly with regulators and exchange views on issues that directly affect the industry. It is crucial to grape growers to keep sulfur in their arsenal.

“The Winegrape PMA believes that providing education and outreach to growers, farm workers, and the general public will enable the industry to address pest management issues,” Browde continued. “Education is a better answer than excessive regulation.”

Former CAWG Chairman Randall Lange of Lange Twins also participated in the seminar and found it worthwhile. “Whenever the farming community can meet face to face with regulators, it can only lead to better communication. Each side can do their job better and help address each other’s problems and challenges,” Lange said.

Additional seminars will be held next year and cover such issues as soil fumigation options and the West Nile virus. For more information, contact Bob Elliott at belliot@cdpr.ca.gov.

CCWGA Community Forum Addresses Concerns About Sulfur Use

By Vic LeBlanc

CCWGA Sustainable Vineyard Newsletter – March 2003



After a successful Community Forum on Sulfur Spraying, some of the event organizers gather with the members of the panel for a photo opp inside St. Mark's in the Valley church hall. Back row, left to right: Joe Browde/Winegrape Pest Management Alliance, Kevin Merrill/CCWGA, Michael Kaplan/Neighbors at Risk, Santa Barbara County Deputy Agricultural Commissioner Joe Karl, Robert LaVine/Robert Mondavi Wine Estates, wine grower Jeff Newton; front row, facilitator Lyn Rodriguez, wine grower Jeff Frey, Bob Thiel/Community Environmental Council; seated Eric Cardenas/Environmental Defense Center.

Due to a high level of interest from the Santa Ynez Valley community, the CCWGA Santa Barbara County Wine Industry Task Force hosted a forum on sulfur spraying Tuesday, Jan. 21, at St. Mark's in the Valley Episcopal Church in Los Olivos.

Co-sponsoring community groups included Central Coast Vineyard Team, Community Environmental Council, Environmental Defense Center Central Coast Environmental Health Project, Winegrape Pest Management Alliance, and Women's Environmental Watch.

With both the proliferation of new vineyards and new home sites on the Central Coast, more residents are becoming concerned about the use of pesticides on farms near residential properties. The forum was designed to give the public an opportunity to learn what farmers, environmentalist, neighbors, and local governments are doing to address this issue, and provide a forum to share questions, concerns and ideas.

Facilitator Lynn Rodriguez served as moderator for a panel that included Joe Browde, of Winegrape Pest Management Alliance, Santa Barbara County Deputy Agricultural Commissioner Joe Karl, Eric Cardenas, of Environmental Defense Center Central Coast Environmental Health Project, Jeff Frey, of Frey Farming, Michael Kaplan, of Neighbors At Risk, Jeff Newton, of Coastal Vineyard Care Associates, and Robert LaVine, of Robert Mondavi Vineyards.

As hoped, the event led to a positive exchange of information and resulted in some positive media coverage. According to CCWGA Executive Director, Victoria LeBlanc, "CCWGA's mission is to protect and promote wine growing and farming rights in the region, first and foremost. Our Wine

Industry Task Force in Santa Barbara County is made up of industry, local government and community stakeholder groups, who have come to and remain at the table because we have agreed to provide a conduit for issues of community concern."

"CCWGA consented to host this forum because of very vocal concerns, mainly in the Santa Ynez Valley area, about sulfur use in vineyards. Certainly, it is a delicate topic, but it is an opportunity for us to present our information and tell our story first-hand, rather than have community members rely on any of the misinformation that's already out there to form their opinions."

As further interest indicates the need, CCWGA anticipates holding similar related events at other locations in San Luis Obispo and Santa Barbara counties.

Pest Management Alliance Highlights

By Nick Frey

SCGGA News – June 2003

One hundred growers and Spanish-speaking vineyard employees attended the PMA Field Day this year. The event was a cooperative effort among CAWG's PMA program, SCGGA and the Russian River Valley Winegrowers.

Michael Costello, from Cal Poly, presented data on the effects of sulfur dust on Pacific and predatory mites. Vineyard blocks treated with sulfur dust at 10 lbs/A did have higher Pacific Mite populations than controls that were treated with either wettable sulfur, or DMI or strobilurin fungicides. Predator mites were also at higher populations when sulfur dust was applied. Studies in 1999 had pre- and post-bloom treatments. While season-long sulfur dust applications resulted in the highest mite populations, pre-bloom dusting followed by liquid fungicidal treatment post-bloom had nearly as high mite populations. Season-long spray applications or pre-bloom spray applications followed by sulfur dust post-bloom had the lowest mite pressures. Treatment costs were compared assuming one miticide application is required with a sulfur dust program but none is required for spray fungicide treatments. Annual costs for the pre-bloom spray followed by post-bloom sulfur dust or season-long wettable sulfur applications were the same as for season-long wettable sulfur applications where a miticide application was required. Future experiments are planned to see if similar results occur with Willamette mites.

Dale Handley discussed steps grower should take to implement a deficit irrigation program. Small berry size, which is important to wine quality, can be achieved with early stress. That can be hard to achieve on the North Coast due to winter rains and a full soil profile in the spring. Once irrigation is initiated, Dale irrigates to keep water potentials as measured with a pressure chamber in the -12 to -14 bars range. As harvest approaches (21 brix), he increases irrigation to keep water potentials between -11 and -13 bars. This contrasts with RDI programs that irrigate to replace a percentage of crop evapotranspiration once irrigation is initiated.

Tom Lanini, UCCE, with support from Kurt Hembree, discussed weed identification and controls. Weed specimens were available in pots for grower and vineyard employees to identify. Lanini discussed several organic weed control measures in addition to conventional herbicides.

The Spanish-language sessions included weed identification, along with sulfur management and safety and vine mealybug identification. SCGGA thanks Lucia Varela for supplying vine mealybug information and Rafael Jimenez of Hafner Vineyards for teaching the session.

Thanks go to all our presenters and to the Dutton BBQ crew for providing a classic Dutton tri-tip BBQ!

Re: PMA/CAWG co-sponsored public forum "Sulfur in Vineyards"; published in Santa Maria Times, Mon., Jan. 27, 2003

Wine growers and their neighbors strive to find a common ground to grow on

By Cynthia Teed / Times Staff Writer

LOS OLIVOS -- Neighbors and wine growers are working to resolve environmental issues involving pesticides in and around this picturesque north Santa Barbara County town.

The controversy over the effects of sulfur drift, the fine yellow power visible in the air as a result of uncontrolled spraying, dominated Central Coast Wine Growers' Association's discussion Tuesday at St. Mark's Episcopal Church in Los Olivos. There was no resolution to the problem, but residents were told sulfur was considered a small threat to health.



The LaPointes say their neighbor's vineyard sprays chemicals that affect their health as it's blown onto their property. // Scott de Freitas-Draper/Times

Residents said they were happy with the forum and looking forward to having more of them.

Joe Browde, project coordinator for California Wine grape Pest Management Alliance, wants the wine growers to continue their dialogue over pest management with their neighbors.

"We do plan make these forums statewide in the wine growing areas," he said. Browde gives the Central Wine Growers' Association high marks for its continued support in airing complaints and finding solutions to problems arising from pest management

The second in a series designed to nurture a good-neighbor policy between wine growers and nearby residents, the forum on Tuesday offered growers and neighbors the chance to air complaints and concerns about the effects of uncontrolled sulfur spraying in the area.

A panel of experts, including Santa Barbara Deputy Agriculture Commissioner Joe Karl and Dr. Ronald L. Tan, senior scientist from the Santa Barbara County Air Pollution Control District and Robert La Vine, Robert Mondavi's area director for statewide winegrowers relations, listened to local residents' complaints about pesticide drift. Sulfur and its application headed the list of concerns.

"In terms of toxicity, sulfur is relatively of low concern," said panelist Joe Browde project coordinator for sulfur stewardship for the California Wine grape Pest Management Alliance. The project is funded by the Department of Pesticide Regulation. "(Sulfur's) a natural element found throughout the environment."

Even the Romans used sulfur as a fungicide in grape vines susceptible to powdery mildew, said Karl. Ironically, the ideal climate for cultivating grapes, a mild one of 70 to 78 degrees, is ideal for the propagation of powdery mildew, a fungus capable of eradicating grapevines leaving entire vineyards destroyed. The organic compound, found in the human body, has been used traditionally in farming crops, especially on strawberries.

"We're not against agriculture," said panelist Michael Kaplan of Oceano. Kaplan heads Neighbors at Risk, a grass-roots organization he founded several years ago to combat the effects of a pesticide called methyl bromide that drifted over to his property from spraying.

"Forums like these can be a win-win situation for us all," he said.

Noreen LaPointe, who lives off Highway 245 between Lompoc and Buellton, has resided in the same house since childhood. Two years ago she began to experience a burning sensation in her eyes and lungs that she attributed to sulfur drift from her neighbor, a vineyard owner who responded to her complaints.

She regards the wine growers as most responsive to complaints and acknowledged that La Vine, a San Luis Obispo resident, on hearing her concerns, urged her to take a pro-active position and protect her own health.

"Some people may be more sensitive than others to sulfur, which is considered a sustainable material," said panelist Jeff Newton of Santa Ynez, co-owner of Coastal Vineyard Care Associates.

Newton and Browde see the controlled use of sulfur as a relatively low health threat. And both Kaplan and La Pointe praised the Central Coast Wine Growers' Association for their efforts in seeking solutions for a peaceful coexistence between the agriculture and residential communities.

According to Karl, whose department fines offenders of Santa Barbara County's zero-tolerance law on sulfur drift, first offenders pay \$300 and upwards depending on the severity of the offense.

"Since 1999, only 18 of the 123 civil penalties issued involved drift (14 percent)," he said. "It wakes them up, we don't have repeats."

Jan. 27, 2003

ABRIL 25, DIA DEDICADO A LA ALIANZA DEL MANEJO DE PLAGAS

La Voz Bilingual Newspaper – April 2003

La Asociacion de Vitivinicultores de California (California Association of Winegrape Growers), La Asociacion de Viticultores del Condado de Sonoma (Sonoma County Grape Growers Association) y los Vitivinicultores del Valle del Rio Ruso (Russian River Valley Winegrowers), estaran presentando el Tercer Evento Annual del Dia Dedicado a la Alianza del Manejo de Plagas (Pest Management Alliance) en el Salon Holy Ghost Hall, localizado en el 7960 Mill Station Road en Sebastopol, el Viernes 25 de Abril, 2003. La registracion para los PCA/PCO y Aplicadores Privados CEU's comenzara a las 8:30 am.

El programa esta abierto a todos los productores de uva, e incluire a Tom Lanini, UC Davis, quien hablara sobre la identificacion de hierbas; Michael Costello, Cal Poly, hablara acerca de los efectos del azufre en las clonias de acaros (mites) y Dale Handley, traera informacion acerca del manejo del riego.

El programa en el idioma Espanol, sera de las 10 am a las 12 del medio dia, e incluire a expositors sobre el uso seguro del azufre, la identificacion del Vine Mealybug, y la identificacion de hierbas.

Al mediodia, los Vitivinicultores del Valle del Rio Ruso ofreceran una comida de BBA por \$10, y puede traer una botella de vino para compartirla. Para reservaciones, llame al Sonoma County Grape Growers Association al (707) 206-0603 o por correo electronico: ipm@scgga.org.

PMA Section of CAWG Web Site – design & contents

Sustainable Winegrowing

Pest Management Alliance

Code of Sustainability

Good Neighbor Guidebook

CAWG lead the Winegrape...
(introduction already provided)

Links for PMA



- I. Management Team
 The Winegrape PMA Management Team
- II. Mission and Objectives
 PMA Mission, Goals, and Justification
- III. Overview
 The Winegrape Pest Management Alliance – Reflection and Future
- IV. Upcoming Events
- V. Grower Case Studies
- VI. Annual Summaries
 Year One (2000-01)
 Snapshot of Achievements
 Final Report
 Year Two (2001-02)
 Snapshot of Achievements
 Final Report
- VII. Grower and Pest Control Advisor Education
 Past Events
 Seminar and Field Day – Fulton, April 2001 (agenda)
 Seminar and Field Day – Hopland, May 2001 (agenda)
 Seminar and Field Day – Carneros, May 2001 (agenda)
 Field Day – Madera, May 2001 (agenda)
 Seminar and Field Day – Fresno, June 2001 (agenda)
 Field Day – Ceres, June 2001 (agenda)
 Seminar and Field Day – Fulton, April 2002 (agenda)
 Seminar and Field Day – Fresno, April 2002 (agenda)
 Seminar and Field Day – Hopland, May 2002 (agenda)
 Handouts and Guidelines
 PMA Overview
 BMPs for Sulfur in Winegrapes
 Sulfur Dust Stewardship and Safety Instructor’s Guide
 Practical Neighbor and Community Relations
 Neighbor Outreach – It’s Your Responsibility

Guidelines for Napa Vyd Open House Program

Guidelines for Lodi Public Educational Events

Photographs

Various photos, e.g. equipment, events

Power Point Presentations

California Winegrape Pest Management Alliance, J. Browde, PMA Coordinator

PMA and Sulfur Stewardship, J. Browde, PMA Coordinator

PMA and Reduced-risk Weed Management, J. Browde, PMA Coordinator

Weed Control Alternatives, K. Taylor, Domaine Chandon

Balancing Costs and Risks in Weed Management, K. Hembree, UCCE

Surveys

North Coast 2001 Survey Results

Statewide Workshops 2001 Survey Results

VIII. Foremen and Worker Education

Past Events

Hands-on Training for Pesticide Applicators - Napa, March 2002 (flyer)

Handouts and Guidelines in Spanish

PMA Overview (Span)

BMPs for Sulfur in Winegrapes (Span)

Sulfur Dust Stewardship and Safety Instructor's Guide (Span)

Photographs

Photos from seminars

Power Point Presentations in Spanish

PMA and Sulfur Best Management Practices, M. Moratorio, UCCE

Judicious Weed Management with Herbicides, J. Kanagy, Nord Coast Vyd Services

Powdery Mildew and Sulfur Management, CCVT

IX. Public Education

Past Events

Vineyard Open Houses - Napa County, April 2002 (reference)

A Stroll Through the Vineyard - Lockeford, May 2002 (flyer)

Handouts

PMA Overview

Photographs

Photos from field events

X. Publications

Taking Charge, W Fruit Grower, February 2001

Improving Sulfur Management, Practical Winery & Vineyard, May-June 2001

The Winegrape Pest Management Alliance, CAPCA Advisor, May-June 2001

Are You a Good Neighbor, Vineyard & Winery Management, May-June 2001

Winegrowers Help Themselves Through Statewide Effort, CA NC Vyd News, summer 2001

CCVT Focus on Sulfur, Wines & Vines, October 2001

The California Winegrape Pest Management Alliance, CWSS Proceedings, 2002

Herbicides Added to CAWG Program, W Farm Press, February 2002

Catching the Drift, CA Farmer, June 2002

Winegrape PMA Field Day Goes Deep, Grape Grower, June 2002