



INTRODUCTION TO THE VINE MEALY BUG

Mealybugs are soft, oval-bodied insects that are pink in color with a white waxy covering that extends into filaments along the margins of their bodies. Adult females lay their eggs in a white, cottony ovisac. Eggs hatch into small nymphs that are called crawlers. These young nymphs are highly mobile and may move or are carried by wind, birds, or ants to other vines. Nymphs gradually increase in size to become adult females or males. While females are the typically observed form of the mealybug, adult males look quite different. They look like tiny wasps and are active fliers that locate the adult females by pheromone attraction.

Several biological factors combine to make VMB a pest of great concern:

1. VMB can be found feeding on all parts of the vine, including the root system, throughout the year. This is not true of the other mealybug pests of grapes, which are mainly found on the above-ground portions of the vines. All stages of VMB may overwinter underneath the bark of the trunk or below the soil line on the root system. Its underground habit provides protection from parasitoids and contact insecticides. VMB are also protected by ants, which “tend” the mealybugs for honeydew and fend off natural enemies.
2. VMB has a number of biological attributes that result in rapid increases in population. The females can deposit >500 eggs (avg. is ~300 eggs/female) and there are 4-7 generations per year, a factor leading to overlapping generations. Typically, pest control applications are timed to attack the insect when it is at its most vulnerable life stage, and this is not possible with VMB, since at any one time, all life stages may be present.
3. VMB excrete copious honeydew that results in sooty mold growth and defoliation.
4. Finally, VMB can vector viral diseases of grapevines, such as leaf roll virus.
5. Vine Mealybug (VMB) is a serious pest of grapevines that was found in Napa County in September of 2002. It first appeared in California in the Coachella Valley in 1994, and spread to the southern San Joaquin Valley in 1998. It showed up in Central Coast vineyards in 2000, and was found in Napa, Sonoma, and Sacramento Counties in 2002. Any vineyard that received plant material from infested areas such as the southern San Joaquin Valley from about 1998 to 2005 is at risk for infestation.



HOW TO PREVENT VINE MEALY BUG IN THE VINEYARD:

Don't bring infested nursery stock into your vineyard!

This is how the first VMB infestations became established in Napa County—and it is one of the most important ways you can make sure you don't get it.

Be certain to:

- Talk to your vine supplier to find out if they are using pheromone traps to assure there are no infestations of VMB and to make sure that they follow hot water dip protocols (127 degrees F for 5 minutes is required to kill all life stages of VMB).
- Train your employees on what to look for. Harvest crews can be especially valuable at spotting VMB infestations. Post the UCCE VMB poster in places where employees will see it.
- Keep in mind that there is no method currently in use to eliminate VMB from green-growing vines. The exception to this is green-growing vines grown from hot water dipped root and scion stock and kept isolated from infestations of VMB through greenhouse or screenhouse culture.
- Call the Agricultural Commissioner's Office if you receive grape vines from an infested county (most grape-growing counties of California have VMB infestations). They may do a visual inspection of the vines and will give you a VMB pheromone trap to place in your vineyard. Learn the signs of a VMB infestation:
 - White cottony masses on the trunk and cordons, especially in cracks in the bark, and showing up on fruit clusters and leaves as the season progresses
 - Ants traveling on drip irrigation wires and training wires, and/or streaming up and down the trunk of the vine. Ants are frequently the first sign growers see of the infestation.
 - Large drips and deposits of sticky honeydew on the fruit clusters—accompanied by white mealy residues of mealybugs and egg masses
 - A water-soaked look on the trunk and black sooty-mold on the leaves



Don't inherit your neighbor's infestation!

- Talk to your neighbors—if they have an infestation, they need to be keeping populations low so that the pest does not spread to your vineyard. If they are not managing their infestation, contact the Napa County Agricultural Commissioner's Office.
- Fencing is recommended to stop leaves from blowing from an adjacent infested vineyard to your vineyard
- Bird netting may prevent new infestations of VMB in areas where both bird damage and VMB infestation is common.

HOW TO PREVENT VINE MEALY BUG IN THE WINERY

The movement of fruit harvested from infested vineyards throughout California represents a possible mechanism of spread of this pest and could lead to additional introductions into Napa County. The current recommendations for winery staff and crush pad operators regarding vine mealybug are:

- Recognize the signs of mealybug-infested clusters. Refer to the Vine Mealybug poster available from UC Cooperative Extension.
- If mealybug-infested fruit is discovered, contact the Napa County Agricultural Commissioner's office to help with proper identification (707) 253-4357. Other less-harmful mealybugs could be present besides the vine mealybug.
- Ask growers delivering fruit from outside Napa County if they are aware of any vine mealybug infestations in their area.
- If the winery receives fruit from infested or suspect vineyards, please take the following precautions:
 - Crush the loads as soon as they arrive at the winery.
 - Thoroughly clean all bins, gondolas and trailers that held the fruit.
 - Properly dispose of the stems - there could still be live vine mealybugs or viable eggs on them. Do not spread the stems in un-infested vineyards.
 - Disposal options include:
 - Return stems to the vineyard of origin.
 - Promptly send them to a commercial composting site.
 - If composting on site, be sure the stems are not placed near vineyards.



THE STATE OF VINE MEALY BUG IN NAPA

The current total of infestations in Napa County is 69. Pheromone traps placed throughout the county have helped locate most of those, and traps continue to be monitored. In many cases, vineyard workers have played an important role in locating the infestation once trapping has narrowed the field down to specific vineyards or areas, so training them on what to look for is a good idea.

In Napa County, our goal is the eradication of VMB. Growers with infestations are asked to sign and abide by a “Compliance Agreement,” a set of guidelines that lays out a program to contain and eradicate VMB. Growers are educated about vineyard operations that can spread the insect, about training their employees to spot infested vines, and about pesticides and treatment methods considered most effective at controlling the pest (and eradicating it when implemented before the pest becomes established).

NAPA COUNTY VINE MEALY BUG PROGRAM COMPONENTS

Detection Activities

Activities in this program area consist of the placement and biweekly inspection of VMB pheromone insect traps, microscopic examination of the traps, and visual delimitation surveys to find the infestations in the field. As part of a county-wide VMB detection program, over eight hundred traps are placed annually and monitored biweekly in vineyards throughout the county. The trapping program starts in May when traps are placed in known infested vineyards.

Pest Management Activities

Containing existing infestations is a priority, with eradication as the goal. The Commissioner has developed a VMB “Compliance Agreement”, that holds growers with infestations responsible for complying with certain “terms of agreement”, including training of employees who may work in infested areas, cleaning equipment and vehicles that might have adhering VMB life stages, wearing disposable coveralls and destroying those that have been exposed to infested vines or soil, notifying the Agricultural Commissioner’s Office of the intent to harvest grapes from infested areas, cleaning harvest equipment, and otherwise assuring that no activities are allowed that might spread the infestation. (See attached VMB Compliance Agreement)



The Commissioner's Office will assure through interviews and on-site inspections that the entities that have entered into Compliance Agreements follow the requirements agreed upon in the document, including training of employees on what to look for in the vineyard and the sanitation procedures to follow to prevent the spread of the pest. If grapes will be transported off site, the Commissioner's Office is to be notified of the date of harvest and the facility to which the grapes will be transported, to assure that the processing of loads is expedited and handled in such a way as to minimize the risk of creating new VMB infestations.

Exclusion Activities

Exclusion activities are aimed at preventing VMB from coming into the county and establishing new infestations. In the last few years, CDFA and the CACs implemented stricter grapevine nursery production standards to prevent movement of VMB. Grapevine nurseries are using effective VMB control programs, such as hot-water dipping of all nursery vines. Communicating with vineyard managers, wineries and wine grape processors to assure that they follow policies and use practices that eliminate the risk of importation of VMB is key. Inspection of grape vines and grapes coming from high-risk areas is another part of the exclusion program.

Education/Awareness

Education and Awareness activities consist of developing VMB related educational materials for distribution and presentation to wineries, vineyard owners and their employees, and vineyard management companies. Educational events have been and will be organized to keep industry members informed of the status of the infestations as well as any new information that may be of value in the efforts to eliminate Vine Mealybug.

RESOURCES AND TOOLS

Napa County UC Extension website:

<http://cenapa.ucdavis.edu/>

(707) 253.4221

Napa County Ag Commissioner's Office:

<http://www.co.napa.ca.us/Gov/Departments/DeptDefault.asp?DID=26400>

(707) 253.4357

Vineyard & Winery Management article: May/June 2004

<http://ucce.ucdavis.edu/files/filelibrary/1650/14714.pdf>

University of California Pest Identification and Information:

<http://www.ipm.ucdavis.edu/PMG/r302301911.html>