

TRAPPING FOR VINE MEALYBUGS

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Vine mealybugs were found in southern San Joaquin Valley vineyards in 1998, the Central Coast in 2000 and in the North Coast in 2002. Grape growers are advised to monitor for this insect and to locate infestations in their vineyards. By taking action early, growers may prevent further vine mealybug dispersion and crop damage.

When mature vines become infested, the insect population will quickly increase and cluster damage may be seen starting as early as the second year depending on the region. Growers and field workers may mistakenly think the damage is due to other mealybugs that attack vines, such as the grape, obscure, and the longtailed mealybugs. However, the severity and type of damage caused by the vine mealybug (VMB) far outweighs that of the other three mealybug pests.

If vines are infested when they were planted, then male VMB trap catches and field crews trained to spot signs of the infestation will locate the problem well before the vines are fully trained. If no one is looking for VMB in an infested new vineyard, then it may take up to five years to spot the tell tail signs of an infestation. If ants are present, the VMB population increases more quickly and the time period prior to detection is reduced.

Birds that eat infested fruit before and after harvest can also move vine mealybug. Leaves that blow across the vineyard move mealybugs to nearby vines and neighboring blocks. A high population will cause early leaf drop. Infested leaves that are on the vineyard floor are a principle means of VMB spread.

Mature vines can become infested through movement of contaminated farming equipment, field workers who unknowingly transport insects on their clothing and winery waste that is placed in or near vines. Prior to affecting vine growth, a VMB infestation will affect fruit quality. Clusters are damaged by the large number of insects feeding on the bunches and by the copious quantity of honeydew. In the San Joaquin Valley, when high VMB populations occur and the vineyard is not treated, vines may defoliate prematurely and, after repeated annual infestation, vine death can occur.

An infestation of VMB is composed of adult females with eggs, and immatures (crawlers and nymphs of both sexes). The differences between the males and females become obvious by the fourth nymphal instar. Only adult males have wings, thus only males can be caught in a sticky trap that contains a synthetic female sex pheromone.

Pheromone lures that attract male VMB are commercially available and are being used to locate vineyards with new infestations of this exotic pest. The lure is placed inside a delta (tent)-shaped sticky trap and hung inside the vine canopy in the cluster area. The trap is designed to monitor for VMB, not to control the pest. Traps help answer the important

question, “Is VMB present somewhere in my neighborhood?” If trap placement, catch numbers, timing and other factors all point to the likelihood that an infestation is somewhere nearby, then the traps have done their “job” and it is time to focus on finding the female mealybugs and preventing an increase in VMB population density, damage and movement.

The color of the sticky trap is not important when monitoring for VMB. However red is appropriate since it tends to not be attractive to other insects. Since VMB males are extremely small (about one-fifth the size of a grape leafhopper) it is easier to “read” a trap that doesn’t have a lot of small flies and thrips in it.

When to put up traps

The first flight of male VMB in the North Coast begins in May, thus growers are advised to deploy traps in early June. Experience has shown us that very low numbers are common in May and June – even in infested vineyards. In the San Joaquin Valley, males are first trapped in April and May. In both regions, trapping any earlier is not productive.

Vine mealybug generations are not synchronized, thus traps ought to remain in a vineyard until after harvest. Male VMB will be emerging and flying to find females through the fall. Trap catch numbers in the North Coast peak in September through November. In the San Joaquin Valley a noticeable peak is July and August. A late summer or fall peak in male flight may be due to the fact that the population of immature females is declining, thus more males are in flight looking for them.

The lure tends to be specific for mealybugs in the genus *Planococcus* (which contains the vine mealybug), however males of grass mealybugs (*Phenacoccus* sp. and *Chorizococcus* sp.) are occasionally trapped as well. In spring, males of grape mealybug (*Pseudococcus maritimus*) may be trapped but only rarely. With practice and a dissecting scope (30x), mealybugs can be identified in the sticky traps and separated from other small insects. However, it is difficult to separate VMB males from other male mealybugs. To be certain which type of male mealybug you have found in a trap, bring the trap to your local County Agricultural Commissioner or UC Cooperative Extension office.

Ideally, traps should be inspected every two weeks – especially if males are caught. At that time, replace the trap and transfer the lure to the new trap. Don’t go any longer than four weeks since you may lose information if something happens to that trap and you can’t find it. Also, any field operation that causes dust will make a trap very difficult or impossible to read. (Dusting sulfur is not a problem.) Lures should be replaced every two months. Once you have selected a trap site, keep with it throughout the trapping season.

Trap density suggestions vary. If you have no idea if VMB is in your neighborhood, then place a trap every 80 vineyard acres. If males are caught, then increase the density to a number that works for your operation. In 2004, the Napa County Agricultural Commissioner’s office plans to place seven traps every square vineyard mile. In Sonoma County, growers who participated in a voluntary program in 2003 set out one trap every 20 vineyard acres or one trap per vineyard in smaller properties. Target sites that have vines that are six years old or younger. Also, target blocks where stems and pomace are traditionally spread.

After VMB are trapped

The number of male VMB trapped per week, the timing and the location of your neighbors' vineyards all help to define the next steps. In Sonoma, a July trap count of 10 males per week can mean that the infestation is nearby. However, if this number were trapped in September or later in fall, then the infestation is probably not close to the trap site. At that time of the year, several hundred males can be caught in a trap placed near an infestation. In the San Joaquin Valley, a trap count of fewer than 20, at any time of the trapping season, is difficult to interpret. Regardless of the location, low counts provide a "heads-up" for you to continue trapping the same site into the fall and track the counts.

In research studies, the pheromone traps have captured VMB from up to 800 yards from the nearest mealybug infestation. However, because the males are not strong flyers and do not live for more than a few days, it is possible that when males are caught more than 100-200 yards from a mealybug source, they were transported by wind. If your traps are downwind from other vineyards or if air currents move onto your hillside property off the valley floor that has vineyards, then the male VMB may not be coming from your property.

One suggested method of reducing the chance that the males you catch are from great distances is to set out traps only in the morning hours and to remove them before the wind picks up in the afternoon. Check for the presence of males that day, before the wind increases.

When managers of neighboring vineyards work together and share trapping results, the chances are improved that the infestation can be located sooner than later. If a trap on one side of your property is catching VMB males, it makes sense that your neighbor set out traps as well so that both of you can compare numbers, choose to increase trap density or start walking to find the infestation(s). The common goal of course is to decrease the population and to prevent movement.

Zeroing in

When trap catch numbers indicate a nearby infestation, it is time to start walking and find it. Field workers can be trained to be on the lookout for signs of VMB infestations while performing various activities. Just before a crew sets out to do a new task on a ranch such as shoot thin, trunk sucker, move wires, pull leaves, etc. spend three minutes reviewing what the signs of an infestation would look like at that time. Combined with trapping, the majority of the infested sites located last year in Sonoma County were due to observant field workers who had been told what to look for. See **Signs of Vine Mealybug Infestations** for more information.

Not surprisingly, grape and obscure mealybugs were discovered for the first time in some sites. For photos of all three mealybugs and hints on how to tell them apart, visit <http://vinemealybug.uckac.edu>

Control or eradication?

Growers have tried bark stripping along with pesticide applications, steaming vine trunks with hot water, vine removal and vigilant pesticide applications alone. The jury is still out as to

whether these practices do more than just reduce population levels. It may be possible to completely remove it from specific sites but not others depending on the number of infested vines, vine age, severity of infestation and proximity to other infested sites. After eradication attempts and even after ground surveys no longer find female mealybugs, traps should continue to be deployed to monitor for residue populations. For information on control, visit <http://www.ipm.ucdavis.edu/PMG/r302301911.html> or contact your local UC Cooperative Extension office.

Take home messages

Set out VMB traps this year to learn if this pest is in the vicinity of your vineyard. When you trap VMB males, contact your vineyard neighbors to strategize on additional trap locations of mutual interest. Provide training for field workers so that they may recognize a few key signs of the bugs and the damage they cause. After an infestation is located, take measures to reduce the population and contain its spread by field activities.

Signs of Vine Mealybug Infestations

- All year long in young vines: Individuals or residual white cottony egg sacs at the graft union
- All year long in mature vines: Residual white cottony egg sacs embedded within the bark on the trunk and cordons
- In winter and early spring: Black sooty mold on cordons
- Late spring: crawlers and nymphs at the base of the shoots
- Summer: all stages will be on all above ground parts of the vine:
 - Bright white spots (females) on top of the bark on the trunk and cordon
 - Wet basal trunk area*
 - Sticky honeydew on the leaves in the cluster zone*
 - Ants*

*These may also indicate the presence of other types of mealybugs, fruit leucanium scale or grape whitefly. Wet trunks can also be present with grape mealybug infestations **not** associated with ants.

To order photos of VMB infestations, visit

<http://ucce.ucdavis.edu/files/filelibrary/2020/10858.pdf>. To download a user-printable bilingual poster, go to <http://ucce.ucdavis.edu/files/filelibrary/2020/8893.pdf>