

US EPA Grant Supported Integrated Pest Management for Vine Mealybug

In 2000, with funds from CA Department of Pesticide Regulation, the Sonoma County Grape Growers Association, predecessor to the Sonoma County Winegrape Commission (SCWC), initiated an Integrated Pest Management (IPM) program with the goal of encouraging the adoption of integrated pest management practices, reducing the use of organophosphate and carbamate insecticides and encouraging the use of reduced-risk pesticides. With support of two grants from US EPA, the program has grown through the years providing outreach in different venues to reach growers, vineyard managers, pest control advisers, organic producers and vineyard employees. By 2007, the use of 9-targeted pesticides under FQPA review was reduced by 67% from 1999 usage, despite an increase of 19,500 grape acres.

The detection of the exotic pest Vine Mealybug (VMB) in Sonoma County in 2002 caused the gradual increase in the use of chlorpyrifos, one of the pesticides we had targeted for reduction. Continued increases are likely as VMB infests new vineyards. The increase was due in part to initial efforts to eradicate VMB. UC IPM Program Pest Management Guidelines for VMB control have been developed primarily in the San Joaquin Valley. The cornerstone of these guidelines is the use of chlorpyrifos at both delayed-dormant and post-harvest periods and the use of imidacloprid through the drip irrigation system in the spring. These guidelines are not effective in the North Coast for three reasons: the location of the insect under vine bark in early spring (delayed-dormant period) prevents the material from reaching the target insects; the region can receive high amounts of precipitation at that time increasing the risk of chlorpyrifos runoff into streams; and many soils are high in clay which results in poor uptake of soil applied imidacloprid.

We developed and promoted an integrated pest management approach for VMB control that relies on good sanitation practices, conservation of natural enemies, ant control to reduce disruption of natural enemies, use of reduced-risk insecticides, and if necessary, use of chlorpyrifos only at appropriate timings. We also encouraged communications among neighboring growers with infested vineyards to promote management at an area-wide level.

We have shared information on VMB detection and IPM control strategies at monthly grower meetings held April – July. In addition, we created neighborhood groups that included growers who farm near known infestations. These groups share information on VMB spread and controls. Some groups also implemented mating disruption using pheromones as part of their IPM programs. The research objective was completed by Lucia Varela, UCCE, with collaboration by Sandy Henson, Jackson Enterprises. It was determined that post-harvest applications of chlorpyrifos were effective as long as crawlers were in the canopy and had not moved under the bark or soil. Delayed dormant applications were projected to be less effective because many VMB had moved under the bark. Alternatives to chlorpyrifos and imidacloprid were tested during the growing season. These included the insect growth regulator, Applaud® (buprofezin); the neonicotinoid compounds of Platinum® (thiamethoxam) and Venom® (dinotrefuran) as alternatives to imidacloprid and a new product, Movento® (spirotetramat).

We estimate VMB has infested 2000-3000 grape acres in Sonoma County based upon PUR data for both buprofezin and chlorpyrifos usage. Spread of VMB threatens the 60,928 grape acres in Sonoma County.

The research and resulting education programs reduced chlorpyrifos usage substantially. Post-harvest treated acreage increased from 2006 levels, but there were significant reductions in chlorpyrifos usage in months when VMB were under the vine bark or soil. The percentage of chlorpyrifos applied when optimally effective compared to treatments in months when efficacy is less likely increased from 56% of treated acres and 48% of pounds applied in 2005 to 256% of treated acres and 289% of pounds applied in 2008. Growers drastically reduced chlorpyrifos for usage when it was least efficacious.

This study shows that under North Coast conditions the use of chlorpyrifos at the delayed dormant period is not necessary and can be eliminated. More recently, research has documented the effectiveness of reduced-risk insecticides, such as the neonicotinoid Platinum® (thiamethoxam), and the insect growth regulator Applaud® (buprofezin). (Venom® (dinotefuran) is also used and has similar results to imidacloprid, but may be more effective on heavier clay soils.)

The EPA funding was further leveraged during this period by Suterra who provided VMB traps to aid detection, and Jackson Wine Estates who hosted the Alexander Valley neighborhood group communications and meetings in addition to providing vineyards for the UCCE research.

Growers are encouraged to continue trapping for VMB males so that new infestations are detected while populations are low. Once an infestation is detected, the Commission will assist in coordinating neighborhood VMB groups to share information that will slow the spread of the insect to neighboring vineyards. Contact ipm@sonomawinegrape.org or call 522-5862 if you would like to create a VMB neighborhood group.