Sustainable Control of Vineyard Pests

Summary by Remi Cohen

The Napa Sustainable Winegrowing Group (NSWG) hosted a seminar entitled 'Sustainable Control of Vineyard Pests' on March 30, 2006. The program began with a welcoming address by Astrid Bock-Foster, Program Director of NSWG.

The first speaker was Katey Taylor, Chairperson for the Vine Mealybug (VMB) Workgroup updating attendees on the recent developments by the group in its third year of operation. The VMB Workgroup's goals are to educate and create awareness about VMB via trapping programs and data dissemination. The trapping program continues with a recommendation of at least 1 trap per 30 acres and either a self service ($98/site) or full service ($178/site) option. The group notices higher number of males later in the season, stressing the need for diligence in trapping for the full season. The group has coordinated efforts on a VMB sniffer dog project where dogs are trained for VMB specific female pheromone detection in vineyards. The first litter is almost ready for adoption and the group is looking for handlers who will adopt and help train these adorable and obedient dogs.

Dr. Lucia Varela, North Coast IPM advisor with University of California Cooperative Extension (UCCE), updated attendees on control of Lecanium scale in Vineyards. Lecanium scale reaches its 3rd instar phase by March, lays eggs by April, and the eggs begin to hatch releasing the crawlers in mid-May, with 50% release (a good time for control) by mid-June. Varela pointed out that a partial second generation has recently been discovered in scale, although they seem to create fewer progeny than the first generation. Varela explained the best way to determine % release is by turning over a random sample of perhaps 10 females and look for egg movement. The scales migrate to older wood in October. Scale has been increasing in vineyards due to rises in the populations of Argentine ants, and the scale would be easier to control by natural enemies without the ants around. As far as chemical control is concerned, trials in 2002 and 2003 showed Admire to be ineffective. In 2002, Neemix oil was initially more effective with just one spray than the other treatments (Applaud, Stylet oil, or water control) but by the second application, the stylet oil treatment was the most effective form of control. In 2003, the Applaud was applied earlier and thereby became as effective as the stylet oil. Neemix did not perform as well. Stylet oil can also be used as a powdery mildew control. Lorsban is a very effective insecticide but it has the potential to contaminate groundwater and Varela was looking for lower toxicity forms of chemical control.

Along with Farm Advisor Rhonda Smith, Varela did research on the survival of VMB in winery waste. There studies showed that 1% of VMB survive the destemming operation. Low numbers survive the press cycle as well but that is dependent on the cycle and the type of material inside (% stems and berries). Round piles of pomace, when covered, reduce the survival of VMB by 99.9%. Uncovered piles were not as effective. Wind rows were too big and had similar survival rates as uncovered round piles. She recommended composting the pomace and not distributing pomace into the vineyard unless it has been composted.

Dr. Eric Nelson, from UC Berkeley, presented his research on Argentine Ant Control. Most research has been on the grape mealybug (GMB) and they are looking now at VMB, the more damaging invasive mealybug (MB). His research has focused on liquid baiting, a less toxic alternative to Lorsban application, and also allows the ants to spread the toxin themselves to the rest of their colonies, not just the foragers, because the kill is slower. They showed that MB populations decline when 'Tanglefoot' is applied as a barrier around the trunk, blocking ants. Therefore, they created bait stations with sugar (25%) and water and toxins (thiomexam, fipronil, imidacloprid, and boric acid). They monitored tubes for ants, checked MB counts, and performed damage ratings on clusters. There was less damage on clusters with baited vs. control sites. The experimental design requires 50-160 stations/ acre with 3-5 fills per year so they are trying to determine a commercially viable means of baiting. Perhaps locating the stations strategically or a modified design would help. Baiting earlier in the season (March-May) is crucial. They are working with Bayer to create a commercially available product.

Ed Weber, Napa Farm Advisor with UCCE, discussed mites in vineyards. The Willamette mite is more accustomed to cooler climates, is lighter in color, less spotted and has clear front legs as compared to the Pacific mite which is more accustomed to warmer climates, is darker and more spotted, and has colored legs. Both are in Napa, but their leaf infestation patterns different with Pacific having more clumped colonies and Willamette spread out along the veins. Both have several generations per year, and a generation can take as little as 10 days. The Western Predatory mite is a natural predator, which looks like the others but is larger and tear shaped. Releasing predators may have limited success but is best when done on a long term program. The less specific predators include the six-spotted thrips, minute pirate bug, and lacewing larvae. Chemical control has transitioned from more toxic chemicals such as Omite, Vendex, and Kelthane towards softer chemicals such as Acramite, Nexter, FugiMite, and Agri-Mek as well as oils, such as stylet oil, Neem Oil, GC mite, and Ecotrol. Coverage is critical as always. It is always a good idea to check for the presence of predators because treatment may not be necessary. Reducing dust by treating roads, minimizing dusting sulfur, and using an early season oil control are all effective ways of minimizing mite damage.

Dr. Michael Delwiche, professor from UC Davis, presented his research findings on bird control in vineyards. They developed a speaker system with circuitry that broadcasts alarm/distress sounds from finches, starlings, and robins. The broadcasted calls enhance traditional hazing techniques (cannons, mylar, etc) in bird damage control. They noticed a 7.3% additional decrease in damage, almost doubling the decrease in damage, compared to just the traditional hazing techniques alone. This can save around $450/ac or more and the cost of the unit and its implementation is about $120/ac. Robin and starling damage was reduced more than finches which did note respond as much to the noises.

Dr. Karen Sime of UC Berkeley spoke about biological control of MB by parasitoids and predators. Parasitoids are more specific and they can be very effective but are 'fussy.' Predators are less specific but less fussy. The GMB is a California native and a

parasitoid, Pseudophycus angelicus, is already present. If ants are controlled, the GMB can be very effectively controlled by this parasitoid. The obscure MB (OMB) is invasive and has no resident parasitoids, although know parasitoids exist in New Zealand and Chile. Again, the ants need to be excluded and then the effectiveness of parasitoidism increases. VMB is similar to OMB, and it has effective parasitoids in Israel, but that species may be emerging too late to control VMB here. They are ready to release 2 quarantined predators so research will be ongoing. The bottom line is that control of the Argentine ant is necessary and biological control seems unlikely.

The final presentation of the day was by Sarina Jepsen from UC Davis on the biological control of grape leafhopper (LH), which is known to reduce photosynthetic activity of veins with severe infestations. There are Anagrus species of egg parasitoids that can control LH but they have shown to be ineffective. Creating overwintering habitat for them near vineyards has not increased their effectiveness. Jepsen experimented to see if sulfur or fungicides are impacting the biological control of LH by Anagrus. Her experiment's results showed that there were no drastic effects of sulfur or Flint applications on the survivorship of Anagrus or LH nymphs even though sulfur was toxic to Anagrus in bioassays. A possible follow-up experiment would be to remove sulfur from the vineyard and simultaneously enhance Anagrus habitat.