Vineyard Pest Management News

An OSU Newsletter about Vineyard Arthropods

Oregon State University Extension Service

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March 18, 2008, Spring

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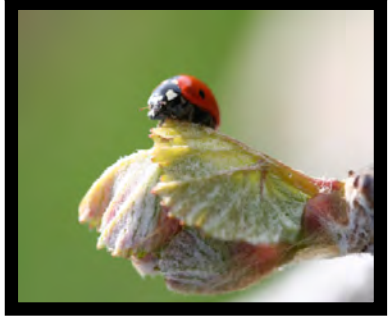

Act now II: Manage mite associated Short Shoot Syndrome (SSS)

Many growers have made use of the opportunity to have shoot samples analyzed for incidence of rust and bud mites during the past two months. In many cases, mites were found (Fig. 1) allowing growers ample time to plan their action to manage SSS. This time of the year is important for vineyard growers who have had SSS symptoms in their vineyards. Find a full description and pictures of SSS at: http://extension.oregonstate.edu/catalog/pdf/em/em8944-e.pdf. Many growers have finished pruning and need to plan to manage SSS during the wooly bud stage. In order to illustrate the potential impact of action during the wooly bud sprays, the following trials were done during 2006/7: ***Small scale chemical field trials*** were conducted after harvest (2006) and during the wooly bud stage during spring (2007) in order to manage mite associated SSS. ***Commercial grower spray trials*** were conducted in collaboration with growers who were asked to leave approx 1/4 acre plots unsprayed in two vineyards (Dundee and Dallas, Oregon). SSS damage was assessed during September 2007 in order to determine differences between treated and untreated vineyard blocks in these trials.

Small scale field trials:

Treatment plots were in two vine rows with a buffer row in between treatment rows. An additional two buffer rows surrounded the treatment rows. Four vines were used as buffer between treatment vines in each row. Each treatment plot consisted of four vines and the two vines in the center were used for collection of sampling materials. The experimental design we used was a randomized block design, with seven treatments and four replications. Data was analyzed with Anova to test variances and means were separated by Fisher's protected LSD test.

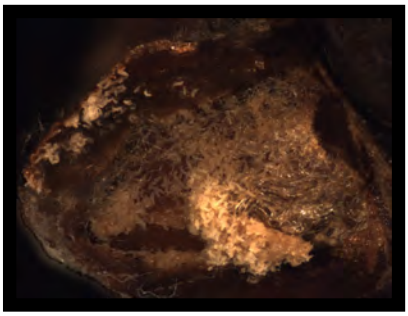

Fig. 1. Eriophyid mites on a bud collected from a Northern Willamette vineyard during January 2008.

No.	Type	Application date
1	Control	
2	Sulfur Fall	After harvest on Sept. 29, 2006
3	Sulfur Fall / Spring	After harvest on Sept. 29, 2006, and at the wooly bud stage on April 10, 2007
4	Sulfur Spring	Wooly bud stage on April 10, 2007
5	Envidor Fall	After harvest on Sept. 29, 2006
6	Envidor Fall / Spring	After harvest on Sept. 29, 2006, and at the wooly bud stage on April 10, 2007
7	Envidor Spring	Wooly bud stage on April 10, 2007

Table 1. Chemical treatments applied for rust mite control on grapes in Dundee Oregon (cv. Pino noir) during 2007. The rates applied for the synthetic miticide (Active ingredient: spirodiclofen; Trade name Envidor. Applied at 18 oz/100gal + nonionic surfactant). Sulfur at 6lbs/acre tanked with a MSO/Silicon surfactant, Cosavet (8oz/100gal).

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Sampling in these trials were done twice, once before treatments on Sept 15, 2007, and after the second treatment on April 30, 2007. On Sept 15, counts of rust mites were made on eight leaves in each treatment plot. Two leaves were collected from the base of the two central vines in each plot and two from the distal part of the vine (eight leaves per plot). On April 30, two vine canes (close to the main trunk, cut at the base and three internodes long) were sampled, one from each of the two central vines in each treatment plot. Samples were placed into cooled boxes and taken to the Entomology lab at Oregon State University, Corvallis for thorough inspection under a dissecting microscope.

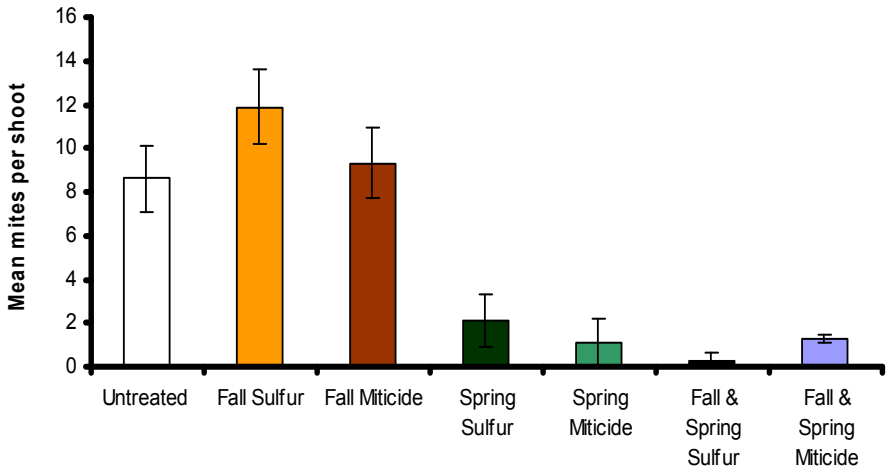

Fig. 2. Effects of timed treatments on mite populations in Dundee OR. Applications were done after harvest on Sept. 29, and April 10, 2007. No differences in mite populations were found pre-treatment. The mean rust mites per leaf were 2651 rust mites on Sept 15, 2006.

No differences of rust mites were found pre-treatment with a mean of 2651 rust mites per leaf. Samples taken after the second application indicated that both sulfur and synthetic miticide treatments applied directly after harvest had little impact on rust mite numbers compared to control (Fig. 2). The spring (2007) application significantly lowered rust mite numbers compared to the fall application and untreated control. Applications in both fall and spring did not prove to add significant control over the single spring application.

Further investigation showed high predatory mite (*Typhlodromus pyri)* numbers associated with rust mite colonies in separate seasonal studies. It is believed that the predatory mite populations aided in the lowering of rust mite populations. Subsequent population estimations of rust mites on developing shoots showed an average of less than one mite per shoot on May 15, 2007. Damage due to rust mite incidence in all treatments was negligible during harvest on October 3, 2007 with less than 1% crop loss in all treatments. This was an unseasonably cool summer which may have been to the advantage to biological control agents such as *T. pyri*, which may have relative high reproductive rates compared to grape rust mites at lower temperatures.

Fig. 3. Effect of early season sprays in two areas in Oregon

Commercial grower spray trials

Two vineyard blocks with high rust mite incidence and SSS were identified during winter 2007. Growers were asked to not apply wooly bud sprays in approximately 1/4 acre sized plots during April 2007. Damage levels due to SSS were compared between treated and untreated plots. Crop loss was determined during September 2007 in both locations. Crop losses in the sprayed plots were significantly lower than the unsprayed plots (Fig. 3). These sprays however did not succeed to fully control the damaging effects caused by rust mites during this season. There may be several reasons for this:

- Damage may already have been caused before mites were killed during the sprays.
- The buds of vines may not have fully opened preventing effective control with the compounds.
- The coverage of sprays were not adequate.

Conclusions

It is believed that spring applications of both sulfur and synthetic miticides will significantly reduce rust mite numbers and crop losses compared to untreated control plots. However, these sprays should be minimized to affected areas only in order to minimize the impact on beneficial insects and mites. Additional data from unsprayed blocks that were monitored through the season showed a steady decrease in eriophyid mite numbers. This is probably due to biological control offered by predatory mite species such as *Typhlodromus pyri* that were found in close association with eriophyid mite populations. Current research is focused to confirm the importance of wooly bud sprays to manage SSS. Research also focuses to determine the impact of regularly used fungicides such as sulfur, oils, Mancozeb and synthetic miticides on important beneficials such as *T. pyri*.