GRAPE RUST MITES: NEW ENEMIES (BUT ULTIMATELY FRIENDS) INVADE WASHINGTON VINEYARDS

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Diminutive Mites, Big Impact

If you thought spider mites were small, take a look at a rust mite. A fully grown specimen measures 0.1 mm from head to toe, compared to your average spider mite which is a colossus at 0.5 mm in length. Spider mites are also round and fat, while rust mites are long and skinny, worm, torpedo or cigar-shaped with legs at the front end. Pretty, they are not and they are unfortunately set to cause some heartache for Washington grape growers over the next few seasons. Walla Walla was the first to experience the insidious impact of rust mites with most vineyards in this appellation recording their presence this past spring. At some sites they caused serious damage to spring growth and buds, resulting in significant decreases in potential yield. Some growers estimate they may lose up to 80% of production in certain blocks.

Figure 1- Shoots affected by rust mites may exhibit stunted growth.

Danger Signs

Although minor, the danger signs were present in many Walla Walla vineyards last season. Bronzing or russeting of grape leaves during July and August is the clearest indication that a significant population of rust mites is present in a vineyard. Populations may number up to 6000 individuals per leaf and unlike spider mites, rust mites are as happy on the sunny side of a leaf as they are on the underside. However, despite the alarming appearance of writhing mites and bronzed leaves, these immense summer rust mite populations are not thought to cause serious damage to the vines or affect fruit production/quality. Bronzed leaves do, however, signal a critical need to control rust mites the following spring if you want to prevent significant damage to buds and shoots.

Overwintered Rust Mites Wake up Hungry!

Before leaves drop in the fall, rust mites respond to cooler temperatures and shorter days by migrating to the grapevine wood. Here they find shelter in cracks and fissures and pass the winter in a state of dormancy. With increasing temperatures and longer days in spring, they awaken and move to buds and new growth and begin feeding. If the overwintering population is large, great numbers of mites will congregate on the limited leaf and bud tissue and cause serious distortion and stunting of leaves as well as killing buds. Research in Australia has shown 400 mites per spur cause leaf distortion; 1200-2800 per spur cause distortion and shoot length reduction by ~50%.

What to do?

Australian research has developed a spring control strategy for rust mites that works very well in that country. Research is needed here to see whether some modification of the strategy is required under our growing conditions to achieve optimal results. However, for now, WSU recommends adoption of the Australian strategy. As noted above, considerable numbers of mites are required to cause economic damage, thus even partial suppression of the overwintered population should help protect the vine and minimize any production loss.

The Australian Strategy

Applying wettable or flowable sulfur at precise timing and high spray volume should result in good control. The aim is to target mites at the start of their spring migration from overwintering sites under the bark of vine cordons/crowns to the buds and shoots. This is before feeding and egg laying begin. For Cabernet sauvignon (the

variety most affected in Walla Walla this year) this is during the period from bud swell to woolly bud. With chardonnay, closer to woolly bud is optimal. Once mites have started feeding and damage appears, it is too late to control the mites effectively. Rust mite eggs are not susceptible to any pesticide and miticides are not recommended for rust mites. Thus, it is critical to apply sulfur (4-4.5 lb) in a high volume (100 galls) of water when the temperature is 60 F or above, during the bud swell-woolly bud period.

Now Is The Time To Check Whether You Have Rust Mites…

Slightly reddened or bronzed leaves should be checked in July and August for the presence of rust mites. If thousands are present, they should be visible on the upper surface of leaves using a hand lens. If it is warm, you will see them moving around like… worms on a hot leaf. Remember; don't be alarmed, you will get a chance to nip this particular group of worms in the bud next spring. Sometimes, you will inspect bronzed leaves and find no rust mites. Bronzing of course remains after the perpetrators have gone and this will be a good sign that the rust mite's major natural enemies (predatory mites) have struck.

Figure 2- Damage caused by rust mites.

The Silver-Lined Cloud

Yes, folks, there is definitely a silver lining to the rust mite cloud that has started casting its shadow on Washington viticulture. The presence of rust mites in vineyards is likely to greatly improve the prospects and potential of spider mite biological control. Recent research by Deirdre Prischmann and myself has shown that the kinds of predatory mites that feed on rust mites are an important component of good biological control of spider mites. Currently, these 'generalist' feeding predatory mites are not very common in most Washington vineyards but with a new rust mite food source arriving for them, they are likely to become more populous. These predators as they develop larger populations, will also contribute substantially to biological control of rust mites, making the sort of 'outbreak' that occurred in Walla Walla this spring less likely.

So although, there are likely to be some dark days ahead with rust mites catching some Washington grape growers unawares, the long term outlook is much rosier. Adding rust mites to our pest inventory will boost our prospects for better natural regulation of spider mites and possibly other pests. Rust mites are likely good 'snack' food for a range of other predators. Detailed research is still required to better understand the biology and ecology of rust mites under eastern Washington conditions, as well as to fine-tune and optimize the sulfur-based control strategy.

Got Rust Mites?

If so, we would like to know. We are currently lining up potential research sites for monitoring next season and welcome your information and involvement. Please email me (david_james@wsu.edu) or Deborah Brooks (brooks1@wsu.edu).

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