Oregon State University OSU

Viticulture Extension

Vineyard Notes

June 2009

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Spring Vine Growth Observations have Mixed Reviews

Over the past few weeks I have seen many vineyards across the Willamette Valley and regions of Southern Oregon and received reports North to South regarding irregular growth. Most vines are growing relatively well, but there are signs of some growth abnormalities. In some cases, this began with uneven bud break and variability in shoot growth. I promised I wouldn't use the dreaded, and somewhat over-used term "Short Shoot Syndrome" as it is now believed there are too many causes to point towards any one factor in the general sense of the stunted growth condition. Yet many of the past informative emails, newsletters and extension programs focused on the observed mite association with these symptoms of distorted and stunted growth in spring. While stunted growth can be a result of mite feeding, there are many other causes of stunted or slow growth and may be the result of the growth distortions observed this season.

Outlined below are several examples of stunted growth observed this spring in vineyards across Oregon. Described are the potential problems that lead to them. Vineyard managers are urged to look closely at affected vineyard sites and management records to determine the causes of any observed distorted growth. It may be related to past weather events (frosts), herbicide drift, past or current water/nutrient stress or insect damage.

The uneven bud break may be attributed to October 2008's early fall frost, and has been observed at sites in various regions across the state. In addition, some vineyards fell victim to this spring's frost events and has resulted in damaged primary shoots, thereby resulting in secondary or tertiary shoot growth. Smaller shoots usually result and are delayed in growth, and reduction in yields are common in these cases due to fewer and smaller inflorescences (flower clusters) on secondary shoots. Small inflorescence size has also been reported at sites hit by the fall 2008 and spring 2009 frosts. When secondary shoots grow out after damage/death of the primary shoots, these shoots are often delayed and shorter in stature but are not often puckered, crinkled or distorted unless they are further damaged by insect pests, herbicides or other damage.

There are some isolated sites that appear to have shoot distortion caused by mite damage. However, it does not appear to be widespread in the Willamette Valley or Western Oregon during last season or this current season. Some sites were found with mite infestation in combination with frost damage and slow growth due to cold temperatures earlier this spring. Areas of the same vineyard blocks that were not damaged by frost appear normal in growth and have little damage to shoots. Vaughn Walton confirmed that there were 5-6 rust mites per symptomatic shoot and predatory mites were also found in samples taken from symptomatic

vineyards. The question is whether these levels are high enough to be considered damaging. Walton's lab continues work on mite life tables and impacts on vines.

A guide to diagnosing issues with non-uniform and stunted shoot growth is available from OSU Extension. It is available online at http://extension.oregonstate.edu/catalog/pdf/em/em8975-e.pdf. This guide outlines the many causes of stunted growth. Be sure to check your records for the following to rule out any specific cause of your problems. Remember that short shoots are not all created equal and are not uniform in their symptoms. Causes of distortion include the following:

- Phylloxera infestation
- Frost damage
- Slow spring growth and chlorosis (AKA "spring fever") due to cold daily temperatures
- Nutritional factors: low B, Zn or low carbohydrate storage
- Herbicide drift
- Mite damage
- Winter damage
- Prolonged water stress
- Virus/disease

Figure 1. Uneven spring shoot growth due to frost damage. Black and dried tissue results from frost damage as shown in the node on the right.

Figure 2. The small shoot (right) exhibits blackening tissue due to frost damage; a healthy secondary shoot remains (left).

Figure 3. Uneven shoot growth results from varied factors influencing this site, including frost damage and cold influence this spring. Some mites were found but at low levels (rust mites) in presence of predators, *Typhlodromus pyri*.

Figure 4. Chlorotic leaf tissues with somewhat deformed margins are common during the cold springs experienced in the Willamette Valley. As temperature warms, these leaves green up as leaves expand. The uppermost leaves on the shoot are most commonly chlorotic during this time.

Figure 5. Rugose growth on leaves can occur as a result of herbicide drift.

Figure 6. Uneven spring growth and significant vine variability is observed due to a lack of carbohydrate reserves in this block on a site with shallow soils, years of water stress and over cropping of struggling vines year after year.

Widespread Evidence of Herbicide Drift?

Herbicide drift is of concern in vineyards whether you are located near grass seed or wheat, other agricultural operations, and urban areas. Specifically, the use of growth regulator herbicides that are damaging to grapevines is quite common in a number of these settings. Vine canopies can exhibit their worst symptoms from early spring through summer when exposed to these herbicides. Growth regulator herbicides are the most damaging to grapevines since they are systemic and can cause damage in more than the point of contact. Damaging herbicides include 2,4-D, dicamba, glyphosate, sulfonylureas and other ALS inhibitors.

During the last several weeks, evidence of herbicide damage on shoot tips and tendrils has been observed widespread throughout most of the Willamette Valley. This has ranged from areas from the mid- to northern- Willamette Valley. The specific damage observed includes burnt tendrils (Figure 7), cupping leaves, and blackened leaf margins (Figure 8) of newly formed and expanding leaves. The specific chemical culprit is still being determined as vineyards have submitted samples to commercial labs for testing. The Oregon Department of Agriculture has been notified about this potential widespread herbicide drift issue.

Weather has been the proposed mechanism as to the widespread occurrence of this damage. The wind and rain storms during the first week of June in western Oregon may be the culprit. This type of system is capable of picking up volatilized herbicides in one area and transferring them to another, moving in air masses and soil particles picked up by the system. These may have been deposited in vineyards, thereby causing the damage. Washington State University Food and Environmental Quality laboratory director, Vincent Herbert, has seen this occur in Washington's industry over the years. A number of herbicides may be at play, and the systemic

nature of many phenoxy herbicides may result in damage in flowers. Keep an eye out for inflorescence necrosis or flower/fruit set reductions. Scout your vineyards, particularly looking at the newest growth near the shoot tips to determine if you see any of this damage.

While the observations across the Willamette Valley suggest a no-fault system of deposition, it is wise to keep abreast of the problem in your own site and report damage as necessary. Closer point applications of herbicide will result in more severe leaf and canopy responses and crop losses than are being currently observed by this widespread phenomenon. Herbicide damage incidences should be reported to the Oregon Department of Agriculture. As always, be sure to communicate with your neighbors regarding herbicide use and application times and keep communication open.

Washington State's Food and Environmental Quality Lab has a leaf index and severity rating key online at http://feql.wsu.edu/EB/index.htm. This provides a pictorial guide to severity of herbicide damage to grape leaves. Most of the widespread herbicide drift appears to be at a low severity levels for the Willamette Valley. However, keeping a close eye on the impacts as we proceed through bloom and the remainder of the season will help determine any lasting impacts of the herbicide exposure.

Figure 7. Damaged tendrils are observed in areas with potential herbicide drift.

Figure 8. A newly unfolded leaf below the shoot tip exhibit burned margins and cupped leaves.

Resources on Herbicide Drift

- Washington State Food & Environmental Quality Lab http://feql.wsu.edu/
- Oregon Department of Agriculture Pesticide Investigation and Enforcement http://www.oregon.gov/ODA/PEST/docs/pdf/investigationflyer.pdf
- Preventing Herbicide Drift and Injury to Grapes- OSU Extension Publication http://extension.oregonstate.edu/catalog/pdf/em/em8860.pdf
- Long distance herbicide transport in the Pacific Northwest http://pep.wsu.edu/tpsa07/Presentations/Amos_Long%20Range%20Transport%20of%20Herbicides%203.pdf

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Phomopsis on the Radar

The fungal pathogen, *Phomopsis viticola* otherwise known as Phomopsis cane and leaf spot, has been observed in some vineyard sites in the Willamette Valley over the past weeks. Many vineyards throughout the western side of the state do not control for this directly. However, it may be a problem as we gain vineyard acreage and/or build up inoculum in the state. Signs of Phomopsis include necrotic tissues on leaves and lesions on shoots (Figures 9 and 10). Eastern parts of the state currently have Phomopsis sprays as their annual spray programs. Scout your vineyard for potential signs and symptoms. For more information on Phomopsis, see OSU's online plant disease guide http://plant-disease.ippc.orst.edu/disease.cfm?RecordID=515.

Shoot and leaf deformations typically observed in the case of frost, cold temperatures, mite feeding, water/nutrient stress do not exhibit the same symptoms as that of Phomopsis. Distinct lesions of the shoot are visible as well as leaf necrosis and puckering as shown below.

Figure 9. Leaf necrosis and puckering is common on Phomopsis infected vines.

Figure 10. Shoot lesions form in spring after infection of Phomopsis.

New OSU Extension Document

Phylloxera: Strategies for Management in Oregon's Vineyards EC 1463-E
Authors: Patty Skinkis, Vaughn Walton, Clive Kaiser
Revised June 2009, 25 pages, no charge
http://extension.oregonstate.edu/catalog/pdf/ec/ec1463-e.pdf

Upcoming Events

OSU Vineyard Sustainability and Mechanization Summer Field Day July 9, 2009
King Estate Winery, Eugene, OR 9:00 AM – 1:00 PM

The Good, Bad, and the Ugly in the Vineyard
Amy Dreves, Entomologist, OSU

- Learn how to look for beneficial organisms in your vineyard and the impacts they have on vineyard ecology and pest populations. This program will emphasize the identification, diversity and abundance of adult and immature forms at the vineyard site; explain how to monitor using shake samples, beat funnels, Berlese's, sweep netting, sticky tapes, and visual examination of buds, shoots, leaves; and discuss the seasonal development of these 'beneficials' and their role in the vineyard.

Making the canopy work for you!
Patty Skinkis, Viticulture Extension Specialist, OSU

- Research projects in canopy management will be discussed with respect to decreasing powdery mildew and botrytis infections while increasing fruit quality. Specific outcomes of research will be reported and discussed in this module.
- Canopy management methods will be highlighted and ways in which fruit can be impacted. A demonstration of different types of canopy management quantification metrics will be performed including point quadrat and sun fleck analyses.

Mechanization Showcase

- Several organizations will be providing demos and talking about equipment efficiency in the vineyard including **canopy management equipment** such as leaf pullers, hedgers, sucker removers and more! Get a glimpse of the new "total vineyard system" that has mechanized everything from pruning to shoot thinning and harvest.
- Vineyard service providers will also be available to discuss irrigation and nutrition monitoring.

ODA pesticide recertification credits will be offered for those attending this event.

Pre-registration is **required**! Register online today!
http://hort.oregonstate.edu/ViticultureWorkshops

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