VIT TIPS

San Joaquin Valley Viticulture Newsletter

UC CE University of California Agriculture and Natural Resources Cooperative Extension

Spring 2016

In This Issue

Phomopsis and Botrytis

Allison Ferry-Abee, UCCE Tulare & Kings Counties

Because of the El Niño this year, we may be getting significant spring rains after budbreak. This means there are several diseases you might need to treat that are unusual for the San Joaquin Valley. This year it will be important to scout for disease symptoms and potentially apply protective fungicides if you receive long, prolonged rain during March and April.

Phomopsis

Symptoms and Disease Cycle

Phomopsis cane and leaf spot is caused by the fungus *Phomopsis viticola*. Phomopsis initially appears as tiny dark spots with yellow margins on leaf blades, veins, and shoots. Symptoms will appear 3 to 4 weeks after rain. Infected leaves will become distorted as they age and never develop to full size. Infections on shoots often crack and can cause a scabby appearance. Moderate to severe infections can reduce cluster counts and cluster weight. Spores are released from previous years' diseased canes after warm spring rains. Moisture is required for infection, and the disease becomes inactive during hot dry weather. In some cases, the disease can become active again after rain in the fall, causing light brown spots on berries and berry shrivel.

Most Susceptible Cultivars for Phomopsis:

Raisin: DOVine, Fiesta, Thompson Seedless

Table: Flame Seedless, Red Globe

Wine: Grenache

Control

If your vineyard is north of Visalia, and/or if you grow one of the susceptible cultivars, it is recommended that you apply a dormant application of lime sulfur (10 gallons per acre in 100 gallons of water). Once shoots emerge, if extended rain is predicted, apply a fungicide with systemic activity prior to the rain event. Contact fungicides can also be effective if they are reapplied after rain. Some effective fungicides include kresoxim-methyl (Sovran) and azoxystrobin (Abound). Unless a vineyard has a history of phomopsis, use the lowest application rate on the label.

Phomopsis and Botrytis continued on page 4

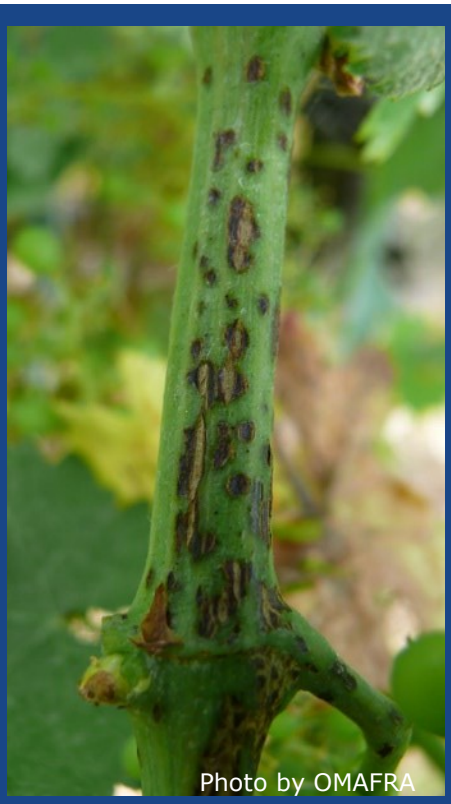

Photo by OMAFRA

Pictured: Symptom of Phomopsis shoot infection

Around the San Joaquin Valley

County Updates

Kern County

Ashraf El-Kereamy

With the start of the new season, for a second year, different trials are in progress to optimize cultural practices of some table grape varieties in the San Joaquin Valley.

Tulare & Kings Counties

Allison Ferry-Abee

We had a meeting for grape growers for Tulare, Kern and Kings Counties in Tulare on February 12. There was a good turnout and some great speakers! Topics included weed control, PGR's for table grapes, cover crops, and canopy management. Next year's meeting will be held in Kern County. If you are not on our list yet for meeting announcements and want to be notified about next year's meeting, contact Allison (aeferry@ucanr.edu) or Ashraf (aelkereamy@ucanr.edu).

Madera, Merced, & Mariposa Counties

Lindsay Jordan

Budbreak started in mid to late February in early varieties, and some varieties are tracking similarly or even one week ahead of last year's notably early season. By the first week of March, budbreak was well underway for Fiesta, Thompson, and Selma Pete, while varieties like Chardonnay, French Colombard, Pinot Gris, and Rubired were all typically showing burst buds, with Cabernet Sauvignon and Zinfandel showing some signs of bud scale separation and/or bud swelling.

Fresno County

Matthew Fidelibus

With early spring rains and an early budbreak, be on the look out for fungal disease pressure. For more information on these diseases, read this month's *Vit Tips* article on phomopsis and botrytis. Weed pressure may also be high, and control tips are in this months "Checklist for Vineyard Management after El Niño" article.

Notice to Readers

Vit Tips: A San Joaquin Valley Viticulture Newsletter will be adopting a new release schedule. In the future, there will be four issues of Vit Tips released annually:

- Spring (February, March, & April)
- Summer (May, June, & July)
- Fall (August, September, & October)
- Winter (November, December, & January)

We aim to release current information that is relevant to the upcoming season. We apologize for the delay releasing this issue, due to the schedule change.

If you received this newsletter electronically, you will continue to receive email updates when newsletters are released. If you want additional information or have questions, contact your local UCCE viticulture advisor.

Checklist for Vineyard Management after El Niño

After the drought, everyone is relieved to have rain forecasted during this El Niño year. However, a wet winter and spring can complicate vineyard management and interrupt normal operations. As we progress into a predicted-to-be wet spring, here are a few things to consider.

□ Are you ready with your spring weed control?

By Kurt Hembree, UCCE Fresno County

Winter weeds were abundant this year, thanks to the large amount of rainfall we had. Hopefully you found time between storms and were able to get into the vineyard and treat for weeds. Given moist soil conditions and warming temperatures on the near horizon, spring and summer weed growth is also expected to be high. So, are you ready to go with your spring weed control program? To make your weed control efforts the most effective and efficient they can be, consider these important measures:

- Spray equipment is functioning properly and has been recently calibrated. Have ample spray equipment and labor available to ensure treatments are timely.
- Herbicides and rates are based on the specific weeds present or expected. Each vineyard may have different weeds, so adjust herbicide mixes accordingly.
- Spray nozzle tips, psi, and travel speed are adequate for the desired coverage of the herbicide types (contacts, systemics, and preemergents). Use drift-reducing spray tips and/or spray shields where possible to help mitigate spray drift.
- Post-emergent materials are applied to small, succulent weeds within two to three weeks after emergence. Pre-emergent materials are applied within 14-21 days of rainfall or irrigation.
- Cultivate with in-row equipment when the soil is moist and weeds are small.
- Evaluate performance of each treatment and adjust next treatments accordingly.

□ Have you considered winter salt leaching?

By George Zhaung, UCCE Fresno County

After four years of drought in the San Joaquin Valley, the potential salt accumulation in the soil has become a big concern for some grape growers, especially when poor quality ground water has been applied with precision drip and deficit irrigation.

As of Feb. 28th, the Fresno area received 9.95 inches of rain and this amount of precipitation accounts for 129% of normal compared to the averages from 1981 to 2010 (http://www.cnrfc.noaa.gov/awipsProducts/RNOWRKCLI.php). Therefore, additional winter salt leaching might not be necessary for viticultural areas in Fresno. However, extra leaching might be taken into consideration if previous salt damage has been observed on vines. Also, leaching might be adjusted on various areas based on farming history, irrigation water, crop type, and management practices.

□ Can you try to avoid soil compaction?

By Lindsay Jordan, UCCE Madera, Merced, & Mariposa Counties

Soil is a complex mix of minerals and organic matter with soil pores that can hold air and water. A well structured soil will have ample pores that can fill with water after a rain or irrigation event. Compaction is when soil pores are reduced in number and/or in volume. Running heavy equipment over the soil surface for normal vineyard operations can result in compaction. Compaction can reduce rooting ability and water infiltration, which in turn can negatively affect your irrigation efficiency and water loss to evaporation. The risk of compaction will vary, depending on the soil type, soil condition, and the amount of vineyard traffic.

- Wet, sandy, or recently cultivated soils are more vulnerable to compaction than dry, finer textured, or firm soils. After a rainy Spring, the resulting wet vineyard soils are at a greater risk for compaction, compared to a drier season.
- Ripping through moist soil will not alleviate and may potentially worsen compaction.

El Niño continued on page 4

Botrytis and Phomopsis, continued from page 1

Botrytis

Symptoms and Disease Cycle

Botrytis, caused by the fungus *Botrytis cinerea*, commonly causes fruit rot in the San Joaquin Valley. However, during wet springs, it can also cause infections in shoots and flower clusters.

Infections almost always begin at leaf, stem and bud axils—water pools in the axil for long periods, creating an optimal environment for botrytis. Botrytis most commonly overwinters on infected clusters from the previous season. You can scout for early season botrytis by looking for flagging shoot tips.

Control

Sanitation is an important part of botrytis control. Culled clusters should be placed in the center of rows at harvest and incorporated into the soil to speed decomposition and remove inoculum sources. As with phomopsis control, if extended rain is predicted, apply a fungicide with systemic activity prior to the rain event. Contact fungicides can also be effective if they are reapplied after rain. It is most critical to protect shoots from botrytis during bloom. For a full list of effective fungicides, see http://www.ipm.ucdavis.edu/PMG/r302100111.html.

Always follow label rates, application methods and recommendations when applying fungicides. Rotate modes of action of fungicides to prevent fungal resistance.


Photo by UC IPM

Pictured: Symptoms of Phomopsis leaf infection (above) and botrytis shoot infection (below)


Photo by J.K. Clark

El Niño, continued from page 3

- Try to time vineyard operations to eliminate or reduce vineyard traffic after a rain event or cultivation operations, when soils are more vulnerable to compaction.
- If you know that necessary vineyard traffic may have compacted your soils this season, think about planting winter cover crops to help correct it.
    - Winter cereals have a fibrous root system that may be better able to establish in compacted soils than other cover crop species.
    - Cover crops can also significantly reduce puddling on the soil surface to help reduce the risk of compaction in the early Spring, and therefore leave your soil less at risk for compaction due to vineyard traffic.


Photo by L. Jordan

Pictured: A mixed cover crop containing barley

Vineyard Management During Stress: Heat and Heat Waves

Ashraf El-Kereamy, UCCE Kern County

Grapes thrive under a warm Mediterranean climate, characterized by warm and dry days and cool nights. However, elevated temperatures up to 95 °F negatively affect vine growth and fruit quality. For the last couple of years California has experienced higher than normal summer temperatures, where temperatures have exceeded the historic average temperature at that specific time of the year. High temperatures may occur either as a constant base for a prolonged period of time or during a shorter period called a "heat wave".

The physiology of heat stress in grapevines

Understanding the physiology and the mechanism by which heat stress affects grapevines helps to manage vineyards during this stressful condition. Vineyard yield and fruit quality depend on the performance of individual vines and their ability to optimize the use of available resources. All vital metabolic processes in the grapevine follow a normal distribution curve, where increasing temperatures lead to increasing physiological activity until a certain maximum temperature, beyond which physiological activities decline. In a grapevine, the maximum temperature for growth and development occurs at 95 °F; beyond this temperature most of the metabolic processes start to decline, affecting vine growth and fruit quality. Moderately high temperature stress impairs chlorophyll biosynthesis, which can be recovered after returning back to normal conditions. However, higher temperatures or a longer exposure time may cause significant and permanent damage leading to a decrease in chlorophyll content and a decrease in sugar and energy supply. The shortage of the energy supply affects the newly grown shoots and fruit. In addition, high temperatures may denature important proteins in the cell membrane and increase ion-leakage, thus creating a loss of cellular function leading to cell death. Some of these responses are due to the production of the free radical, Reactive Oxygen Species (ROS) which reacts and damages the cell pigments and structure. Similar physiological responses are associated with vine dehydration under drought stress. ROS react and negatively affect several cell components, resulting in decreased vine growth and fruit quality. The ability of a specific variety to withstand heat stress is dependent on its capability to tolerate protein denaturation and the ability to remove or overcome the effect of the ROS. Heat stress disrupts the uptake and translocation of water, nutrients, and organic compounds across the plant membranes and negatively affects photosynthesis and respiration. Heat stress reduces leaf osmotic potential leading to stomatal closure and reduces tissue water content, and thus induces "water stress." Naturally, upon the exposure to heat stress, vines respond by the production of protective proteins and other components such as amino acids which mitigate the negative effect of protein denaturation and ROS damage.

Symptoms of heat stress in the vineyard

The negative effect of elevated temperature depends on the phenological stage of the vine. For example, if the vines are exposed to high temperatures early in the season a reduction in leaf area or berry and shoot shriveling may occur. At bloom, heat stress can result in excessive shatter, which affects cluster fullness or reduces the number of berries per cluster. After fruit set, the exposure of the small berries to excessive temperatures can inhibit berry growth and may cause scarring and/or cracking. The effects of excessive temperatures may extend beyond the heat wave, especially if photosynthesis has been impaired. During ripening, high temperatures may inhibit ripening due to reduced photosynthesis and/or the denaturation of proteins in tissues exposed to direct sun. Such fruit tissues are not capable of developing normal color. An inhibition in anthocyanin biosynthesis is seen in the red varieties and green varieties develop an amber color. During berry ripening, high temperature-induced reductions in sugar accumulation can be attributed to a sustained reduction in photosynthesis over several days after the exposure to high temperature.

Heat Stress continued on page 6

Heat Stress continued from page 5

Managing heat stress in the vineyard

Understanding the physiology of heat stress allows us to manage this kind of stress and reduce its negative effects on vine growth and fruit quality. Different strategies should be used in vineyard management to maintain high production with high quality when challenged with warmer weather. Different grape varieties vary in their tolerance to high temperature, which could be due to physiological or morphological structure. For example, varieties with a weak canopy tend to have more problems under heat stress compared to more vigorous varieties.

The following cultural practices can help reduce the damage caused by heat waves during the summer:

- Develop a good canopy early in the season by providing a good nutrition and irrigation program.

- Watch for expected heat waves.

- Closely monitor vineyard water status and avoid a water shortage during and after heat stress.

- Develop good canopy management practices to protect clusters from direct sunlight.

- Rethink shoot thinning or hedging if heat waves are expected.

- Consider using cultural practices or foliar sprays that increase vine amino acid content.

- Watch for pest and diseases after any heat waves that may take a few days to be observed.

Pictured: Color disorder in red (above) and green (below) grapes under heat stress

Upcoming Events

Special Meeting for Grape Growers and Winery Operators in Mariposa, CA

March 31st, 2016 at 10am

For more information, please contact lmjordan@ucanr.edu

UC Davis Viticulture and Enology On the Road in Modesto

Harvest Hall, Stanislaus County Ag Center

3800 Cornucopia Way Suite B

Modesto, CA

April 11, 2016 8:30am-1:30pm

For more information, contact info, and to register, visit: http://ucanr.edu/survey/survey.cfm?surveynumber=17439

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Vit Tips: San Joaquin Valley Viticulture Newsletter is produced through the efforts of UC Cooperative Extension.

Contact your local viticulture farm advisor or UCCE county office to be added to the e-mailing list or if you wish to receive a mailed copy.

Contact Us

Questions? Concerns? Follow up? Please feel free to contact us.

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