2018 in the Vineyard
JUNE

This is a different growing season than we have seen in a long time. It is not a drought year, and it is not drenched like 2017. This cool spring is more typical of many regions in Europe. We're seeing later and inconsistent bud break and slower growth. The switch to warmer weather this month will be interesting to see. Watch out for temperature spikes and make sure your water is adequate as the vines speed up.

Insect Control

Don't forget to include **Dipel** to each acre's spray program. Dipel stops the very youngest Western Grapeleaf Skeletonizer caterpillars before they can start their destruction. Watch for the early signs of 1st & 2nd instar feeding and look for the butterflies fluttering around the vineyard. The 3rd instar starts to get the stripes and poisonous hairs, they are too big for Dipel and voracious, don't let them get going.

Sunshine

Most of the work in June is aimed at getting the right amount of sunshine onto your grape clusters and onto the leaves. A couple of rules: **it takes 10 - 15 leaves to ripen a cluster of grapes**, grape clusters need dappled sunshine to develop the best flavors. Here in Ramona we are lucky to have great sunshine most days of the summer, especially during ripening season from late June through harvest. We are farther south than all the European wine regions and we have altitude. Both factors make it most unlikely that we need to do leaf thinning around our clusters. I only do leaf thinning in a couple of small areas where the vines get uncontrolled water from nearby nursery rows or landscaping runoff.

This time of year you want to avoid "California Sprawl" that is common for table grapes in the Central Valley. Here are pictures of the same rows of Cabernet that have been thinned and trained for sunshine control. It does not take too many weeks for the growth to continue and eventually these will have to be hedged so that the tops of the canes do not roll over to create their own shade zones.

Thinning

We usually do not have to "drop" clusters, it is unlikely to get more that 2 tons per acre here in the valley. 'The book' says that 3 tons per acre is the upper end of optimal quality production. Unless you are pressing that limit, the vines should be able to support the crop load they have set.

Thinning involves removing canes that do not have fruit on them and are in the wrong position to be a replacement spur for next year's pruning. Often two water spouts or basel buds may sprout in nearly the same location. Both will grow to be weak canes and would not be a good replacement spur. If you remove one of them, the other cane has a chance to grow strong before next year.

Canes which are growing out of the bottom of the cordon are not helpful. If they have clusters on them you have to decide if you need the fruit or the sunshine. I tend to remove them unless the particular plant does not have a good fruit set above the cordon.

When to Water

A typical grape vine needs 25-35 inches of water a year, occurring during the spring and summer months of the growing season, to avoid stress. A vine that does not receive the necessary amount of water will have its growth altered in a number of ways; some effects of water stress (particularly, smaller berry size and somewhat higher sugar content) are considered desirable by wine grape growers.

In very dry climates that receive little rainfall, irrigation is considered essential to any viticultural prospects. Many New World wine regions such as Australia and California regularly practice irrigation in areas that couldn't otherwise support viticulture. Advances and research in these wine regions have shown that potential wine quality could increase in areas where irrigation is kept to a minimum and managed. The main principle behind this is controlled water stress, where the vine receives sufficient water during the budding and flowering period, but irrigation is then scaled back during the ripening period so that the vine then responds by funneling more of its limited resources into developing the grape clusters instead of excess foliage. If the vine receives too much water stress, then photosynthesis and other important processes could be impacted with the vine essentially shutting down. The availability of irrigation means that if drought conditions emerge, sufficient water can be provided for the plant so that the balance between water stress and development is kept to optimal levels

Because of the problems associated with water-logged and wet soils, it is important for viticulturist to know how much water is currently in the soil before deciding if and how much to irrigate. There are several methods of evaluating soil moisture. The most basic is simple observation and feeling of the soil, however this has its limitations since the subsoil may be moist while the surface soil appears dry. More specific measurements can be attained by using tensiometers which evaluates surface tension of water extracted from the soil. The presence of water in the soil can be measured by neutron moisture meters that utilize an aluminium tube with an internal neutron source that detect the subtle change between the water in the soil. Similarly, gypsum block placed throughout the vineyard contain an electrode that can be used to detect the electrical resistance that occurs as the soil dries and water is released by evaporation. Since the 1990s there has been greater research into tools utilizing time-domain reflectometry and capacitance probes. In addition to monitoring for excessive moisture, viticulturists also keep anIn addition to its use in photosynthesis. a vine's water supply is also depleted by the processes of evaporation and transpiration. In evaporation, heat (aided by wind and sunlight) causes water in the soil to evaporate and escape as vapor molecules. This process is inversely related to humidity with evaporation taking place at faster rates in areas with low relative humidity. In transpiration, this evaporation of water occurs directly in the vine, as water is released from the plant through the stomata that are located on the undersides of the leaves. This loss of water from the leaves is one of the driving factors that results in water being drawn up from the roots, and it also helps the vine combat against the effects of heat stress which can severely damage the physiological functions of the vine (somewhat similar to how perspiration works with humans and animals). The presence of adequate water in the vines can help keep the internal temperature of the leaf only a few degrees above the temperature of the surrounding air. However, if water is severely lacking then that internal temperature could jump nearly 18 °F (10 °C) warmer than the surrounding air which leads the vine to develop heat stress. The dual effects of evaporation and transpiration are called evapotranspiration.

A typical vineyard in a hot, dry climate can lose as much as 1,700 U.S. gallons of water per vine through evapotranspiration during the growing season.

Powdery Mildew Index

Once initial infection occurs, ideal temperatures for growth of the fungus are between 70° and 85°F. Temperatures above 95°F for 12 continuous hours or longer cause the fungus to stop growing. The powdery mildew index assesses the risk of disease development by relating it to air temperature and tells you how often you need to spray to protect the vines. When using the powdery mildew index, always monitor the vineyard for signs of the disease. If evidence of the disease is not recent, don't treat. You may monitor temperatures in your own vineyard and calculate the PMI using the rules below, or you may use weather equipment that has the UC Davis PMI built into its software.

Initiating the index. After you find powdery mildew, an epidemic will begin when there are 3 consecutive days with 6 or more continuous hours of temperatures between 70° and 85°F as measured in the vine canopy.

1. Starting with the index at 0 on the first day, add 20 points for each day with 6 or more continuous hours of temperatures between 70° and 85°F.

2. Until the index reaches 60, if a day has fewer than 6 continuous hours of temperatures between 70° and 85°F, reset the index to 0 and continue.

3. If the index reaches 60, an epidemic is under way. Begin using the spray-timing phase of the index.

Spray timing. Each day, starting on the day after the index reached 60 points during the start phase, evaluate the temperatures and adjust the previous day's index according to the rules below. Keep a running tabulation throughout the season. In assigning points, note the following:

- If the index is already at 100, you can't add points.
- If the index is already at 0, you can't subtract points.
- You can't add more than 20 points a day.
- You can't subtract more than 10 points a day.

1. If fewer than 6 continuous hours of temperatures between 70° and 85°F occurred, subtract 10 points.

2. If 6 or more continuous hours of temperatures between 70° and 85°F occurred, add 20 points.

3. If temperatures reached 95°F for more than 15 minutes, subtract 10 points.

4. If there are 6 or more continuous hours with temperatures between 70° and 85°F AND the temperature rises to or above 95°F for at least 15 minutes, add 10 points. (This is the equivalent of combining points 2 and 3 above.)

Use the index to determine disease pressure and how often you need to spray to protect the vines. Spray intervals can be shortened or lengthened depending on disease pressure, as indicated in the table below.

SPRAY INTERVALS BASED ON DISEASE PRESSURE USING THE POWDERY MILDEW INDEX

			Suggested spray schedule			
Index	**Disease pressure**	**Pathogen status**	**Biologicals[1] and SARs[2]**	**Sulfur**	**Sterol-inhibitors[3]**	**Strobilurins[4]**
0-30	low	present	7- to 14-day interval	14- to 21-day interval	21-day interval or label interval	21-day interval or label interval
30-50	intermediate	reproduces every 15 days	7-day interval	10- to 17-day interval	21-day interval	21-day interval
60 or	high	reproduces	use not	7-day	10- to 14-day interval	14-day interval

above		every 5 days	recommended	interval		

1*Bacillus pumilis* (Sonata) and *Bacillus subtilis* (Serenade)

2SAR = Systemic acquired resistance products (AuxiGro, Messenger)

3tebuconazole (Elite), triflumizole (Procure), myclobutanil (Rally), fenarimol (Rubigan), and triadimefon (Bayleton)

4methyl (Sovran), and pyraclostrobin/boscalid (Pristine

RESISTANCE MANAGEMENT

Alternating fungicides with different modes of action is essential to prevent pathogen populations from developing resistance to fungicides. This resistance management strategy should not include alternating or tank mixing with products to which resistance has already developed. Do not apply more than two sequential sprays of a fungicide before alternating with a fungicide that has a different mode of action.