Comparing Grape Powdery Mildew Index for Foothill Weather Stations: Spring 2016
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Text referenced from "Grape Pest Management", UCANR publication 3343.

Powdery mildew (PM) cannot grow on dormant grape tissue, it requires green tissue to grow. PM overwinters as ascospores in structures (chasmothecia) on trunks and cordons. It can also overwinter in buds (called bud perennation) but it is unclear how common this is in the foothills. The amount of overwintering mildew is proportional to the amount of disease in a given block the previous year.

Ascospores held in chasmothecia (basically tiny "bags" of spores) are the first spores released in spring. Ascospores are released at temperatures from 50°-80.5°F (optimum is 68°-75°F) after periods of leaf wetness due to rainfall, heavy fog, dew or overhead sprinklers. A model has been developed to forecast ascospore (initial) infection. Ascospore release occurs with 2mm (0.08 in) of rainfall. If it is warm for a week after release you should expect to see disease 7-10 days later on the lower leaf surface of basal leaves. However if spores are released and the temperatures range from 50-60 with cold nights the spores will infect but disease progress is hindered until temperatures increase, thus driving the index to higher numbers and allowing the disease to rapidly increase. UC guidelines state that after this initial period of infection, vineyards should be monitored for powdery mildew by random sampling 10-15 basal leaves from 20 or so vines.

Once initial ascospore infection has been confirmed by monitoring, the Risk Index (RI) model for conidial (secondary) infection begins. **This is the model that our six foothill UCIPM stations are running** and can be viewed at http://www.ipm.ucdavis.edu/calludt.cgi/GRAPEPMVIEW1 **.** It accumulates points based on temperature: 6 hours of temperatures between 70-85°F means the index accumulates 20 points for that day. Until 3 consecutive days with 6 hours between 70-85°F are reached (an index of 60), the index will reset will lower temperatures. Once an index of 60 is reached after 3 consecutive days, the model will continue to run based on accumulating or subtracting points based on temperature.

An index of 0-30 means disease pressure is "low"; an index of 40-50 means disease pressure is "intermediate"; and an index of 60 or above means disease pressure is "high". In order to use the index, a grower needs to look ahead at weather forecasts to predict temperatures for the next week and how that will affect the index. For example, if the index today is 60, but a cooling trend is forecast for the next few days, a grower can expect the index to drop to low pressure. The index is meant to be used as a forecasting tool, not as a "knee jerk" reaction to current pressure.

It is helpful to look at the precipitation and, if available, leaf wetness to try to interpret initial infection periods. Lava Cap, Fair Play, and Ironstone stations have leaf wetness sensors. Gold Hill station is new and the sensors have not yet been placed in the vine canopy.
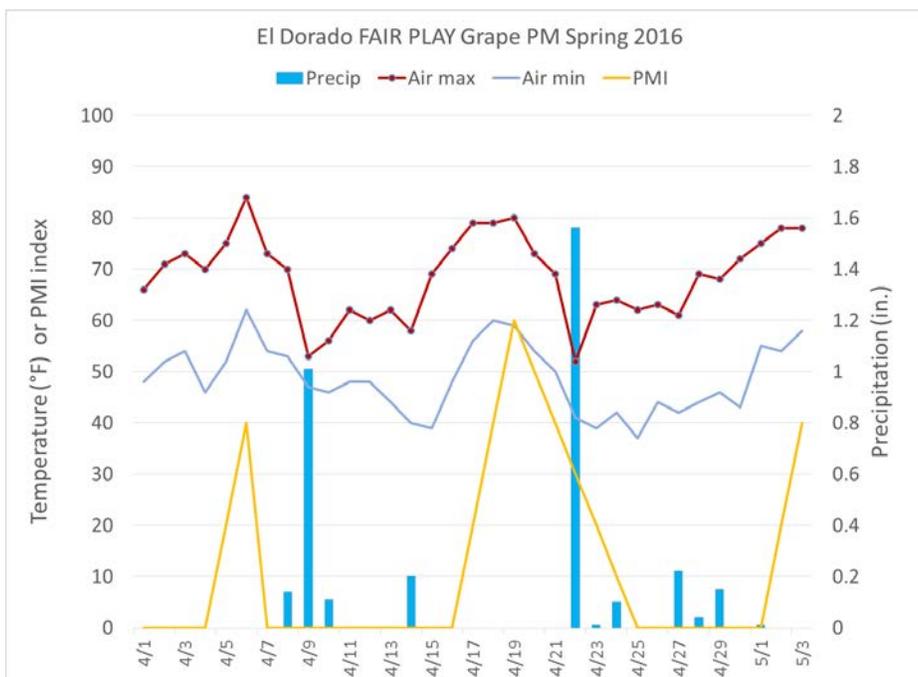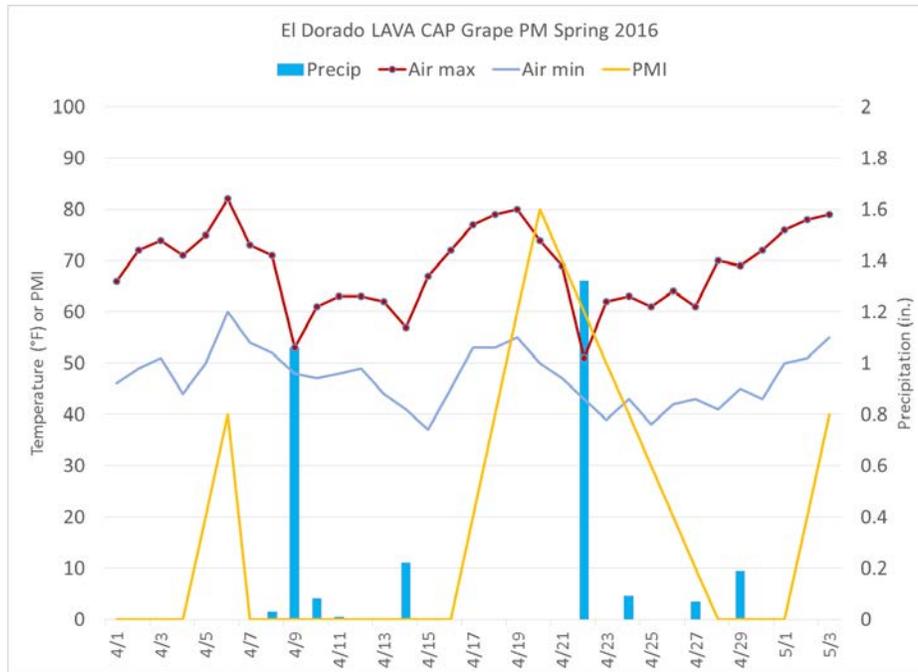
Regardless of leaf wetness sensors, all of the stations have rain gauges and temperature sensors (placed within the vine canopy) which can be used, with some computer work, to try to check gauge initial infection periods.
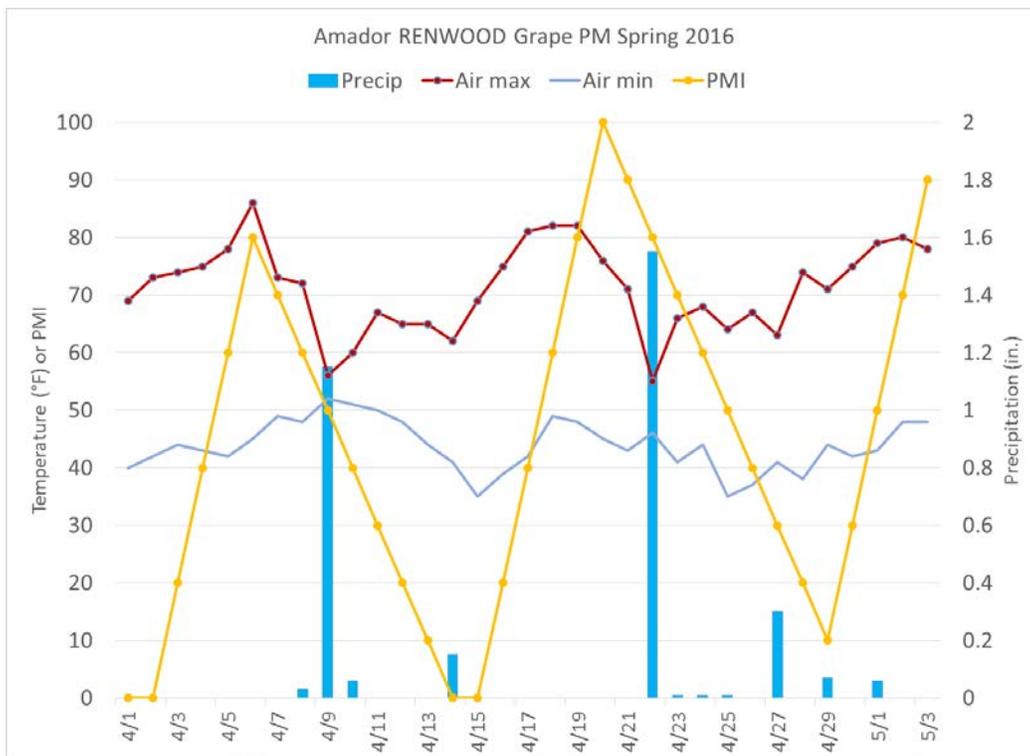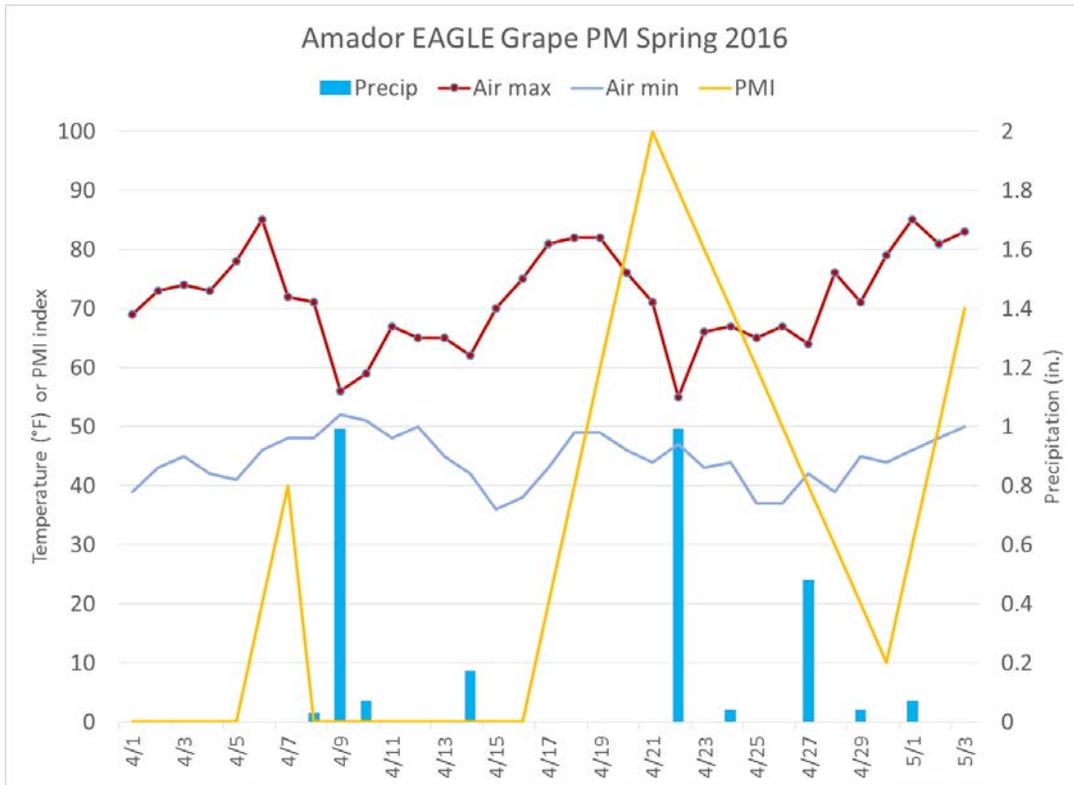
To assist Foothill growers in using the index, I've taken a look at how the stations compare so far this spring.
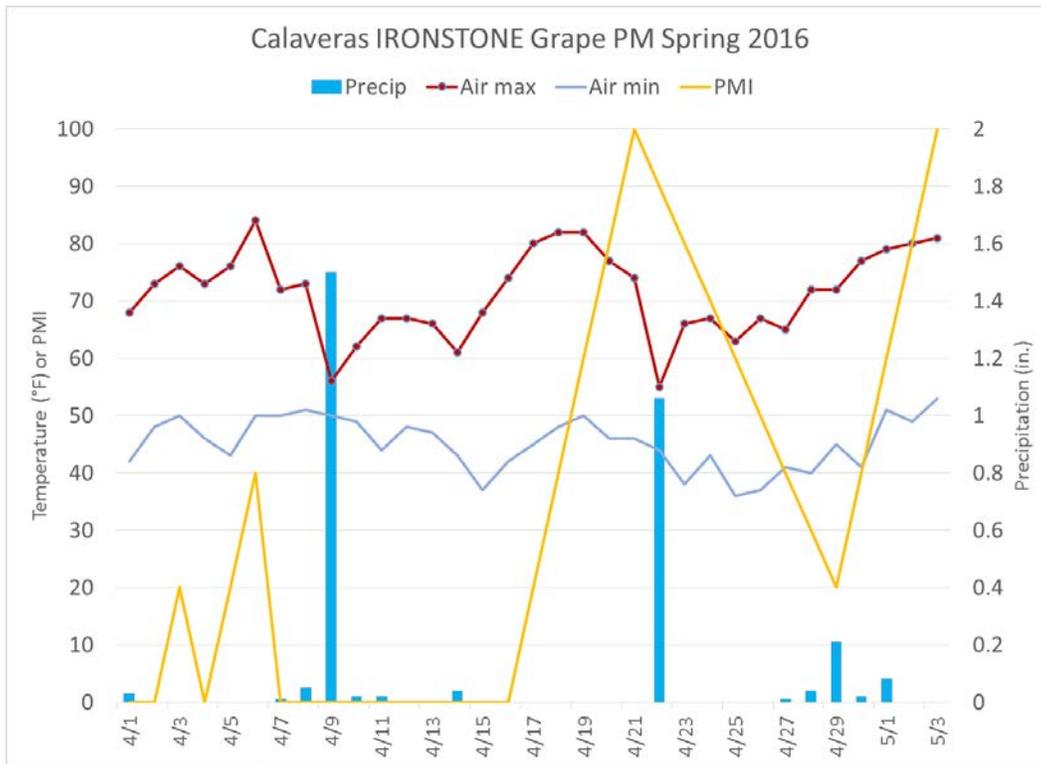
"CYA" NOTE: Please keep in mind that this is not a specific recommendation for your vineyard. Mildew treatment decisions should be based on whether you had mildew in the block last year (if Yes, then I would definitely recommend an early treatment) and the variety susceptibility. Chardonnay, Rousanne, Chenin blanc, Carignane are all considered highly susceptible to powdery mildew infection. Finally, looking for mildew early is the best way to achieve quality management. Early mildew is difficult to spot but can be seen with a trained eye. Work with your local Pest Control Advisor to learn how to monitor for powdery mildew. Many things can be learned when walking your own vineyard!

These graphs show the following as recorded by the PMI Stations and UCIPM: precipitation (in blue bars-read on the secondary axis at the right), maximum daily temperature (red line, primary axis at the left), minimum daily temperatures

(blue line, primary axis), and PMI (yellow line, primary axis). Again, keep in mind that the PMI is calculated as the RI for conidia (secondary) infection-NOT for initial ascospore infection. Remember: the ascospore model for primary infection uses free moisture at least 0.08 in (or 2 mm) and temperatures between 50-85°F to initiate germination. The PMI (yellow line on the graphs) is calculating the index based on temperature and ASSUMING you've already had initial (ascospore) infection. This is why, in the graphs below, the PMI goes up when the temperatures go up, and down during cool periods. It also explains differences in the PMI based on location, i.e. Ironstone is the warmest location and has the highest spring PMI. Mildew doesn't like it HOT though, and the PMI will decrease when temperatures reach 95°F or above. This is important to understand, as I believe foothill growers may be able to save at least one initial mildew treatment, based on block previous history and careful monitoring, in the spring season since it typically takes awhile for temperatures to warm up coinciding with leaf wetness periods, depending on location.

Amador EAGLE Grape PM Spring 2016

Amador RENWOOD Grape PM Spring 2016

For more information on using the grape powdery mildew index, consult the UCIPM website at: http://www.ipm.ucdavis.edu/PMG/r302100311.html or attend the upcoming Foothill Grape Day meeting, with Dr. Doug Gubler, our expert plant pathologist, to be held May 18 at the Amador Fairgrounds. Information for Grape Day can be found at: http://cecentralsierra.ucanr.edu/Agriculture/Viticulture/Foothill_Grape_Day_2016/