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University of California
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Pomology Notes

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E-MAIL EXTRA!

Heat Risk and 2014 Sutter/Yuba Prune Bloom

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It looks like many orchards in the Yuba City area will be at full bloom this weekend (March 15-16). The National Weather Service is predicting high temperatures to reach upper 70's over the weekend, while accuweather.com predicts highs in the range of 81-82°F for the weekend. Recent history suggests the combination of predicted full bloom timing and very warm weather forecast may risk a poor fruit set this year in the region (see graph at the end of this article). While it is too early to tell what will happen, by the time anyone knows for sure it will be too late to do anything. So, while there is, currently, no "silver bullet" fix for high temperatures at prune bloom, the following are some general suggestions to improve prune set during hot bloom weather. Many of these ideas are based on grower experience. These points are not listed in order of importance or efficacy.

- **Cool the orchard with irrigation water**. Evaporative cooling may reduce temperatures enough to help set a decent crop. Impact sprinklers or micro-jet irrigation systems have an advantage over flood irrigation systems for orchard cooling. There are reports of good crops in 2005 after running water, while other growers ran water with no benefit. In 2009, we could measure only very small reduction in orchard temperatures at mid-day (1-2°F) and increase in relative humidity (10%) where water was run during hot weather. This could be the difference between disaster and a light to moderate crop, but don't expect miracles.

Here are some key points to consider when using irrigation water to try to reduce temperatures in an orchard:

- The top one foot of soil should be moist (not saturated) when warm weather hits, so there is no need for deep watering to help with heat at bloom.
- If you can only irrigate part of the orchard per set, run water long enough to wet the soil and then shift flow to another part of the orchard. "Flash" irrigation water across irrigation checks and move on to others when using flood irrigation. If the soil surface drys and isn't rewet, the potential for evaporative cooling decreases significantly.
- Concentrate irrigation/cooling efforts on the upwind side of the orchard. Let the wind (if it is blowing) move the cooled air through the orchard.
- The key times to run sprinklers are when temperature in the orchard are above 70°F. Running your sprinklers at night to protect against high temperatures is like running your sprinklers during the day to protect against freezing temperatures at night. The goal of sprinkling to reduce temperatures is to get water to evaporate as it moves from the sprinklers to the ground. More evaporation will occur during the heat of the day than when it's cool.

- **Get bees in the orchard**. A savvy grower I know increases his hives/acre rentals in warm weather and reduces the number in cool years when good set is expected. Native bee populations are not enough to provide sufficient bee activity in the orchard, especially in a warm year. Experience suggests better fruit set in 2005 and 2007 on trees close to hives, and poor fruit set away from the hives.
- **Leave grass long in the orchard**. Tall, well irrigated vegetation should be 1-2°F cooler compared to short mowed vegetation on the orchard floor. Tall grass/orchard vegetation is risky when frost is forecast, as the orchard stays cooler. There is no frost in the weather forecast for the next week as of Friday, March 14.
- **Track bloom and keep records for future reference**. Take a photo of the orchard every day from the same location through bloom so you can match bloom timing with temperature and, eventually, crop yield to get a sense of how the weather or different practices (water, bees, mowing, etc.) affected your orchard(s).

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Maximum daily temperature (°F, averaged over an hour) during prune bloom in the Yuba City area in 2005, 2006, and 2013. Crops in those years were disastrously low (2005*), very high (2006*) and very low/poor (2013). Data are for days ahead of and following full bloom (defined here as 80% open flowers). Current year (2014) temperatures are reported through Thursday, March 13, and assume full bloom will be Sunday, March 16. *Sutter County average prune crop production (dry tons/acre) as reported in the Sutter Co Ag Commissioner's annual Crop Report was 0.7 in 2005 and 2.61 in 2006.