

Using the Pressure Chamber (pressure “bomb”) to Measure Vine Stress.

The Fruit and Nut Center site has excellent pages on the Pressure Chamber:

http://informatics.plantsciences.ucdavis.edu/Brooke_Jacobs/introduction.html#

The UC Fruits and Nut Research Information website has a page that will give “baseline” SWP and LWP for a given day and time the measurements are taken, within a week of taking them.

This data helps you know what a vine that is unstressed (i.e. no water deficit) would read taking into account that day’s temperature and relative humidity.

http://informatics.plantsciences.ucdavis.edu/Brooke_Jacobs/index.php



Calculating Stem Water Potential

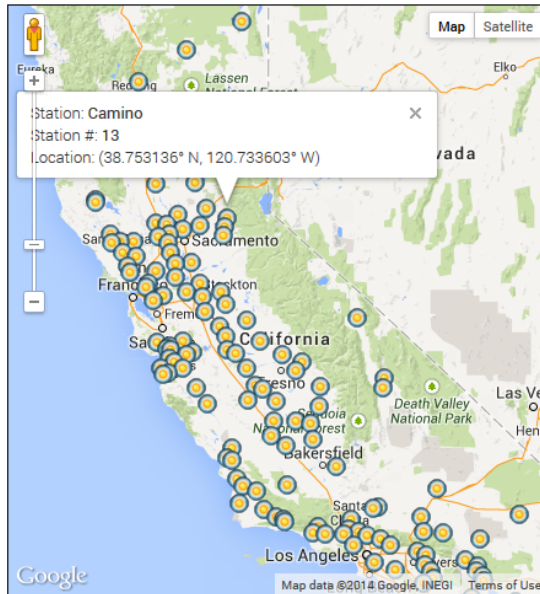
In the box below select the CIMIS weather station closest to your orchard, or with the most similar climatic conditions. The map on the right can be used to zoom in on individual locations to help select the best station to calculate reference water potential. After selecting the appropriate station enter the date (within one week) and the time of pressure chamber readings. Temperature, relative humidity, and reference water potential values for almond, prune, walnut, and grape (both SWP and LWP) are displayed.

After selecting the appropriate station enter the date (must be within one week of the current date) and the time of pressure chamber readings. *Pacific standard time is used, subtract one hour from daylight savings time.*

Active station:

Date/Time:

CIMIS Weather Stations



Time	Temperature (F)	Relative humidity	Almond/Prune	Walnut	Grape(SWP)	Grape(LWP)
11:00 AM	69.4	37.0	-6.0	-3.8	-3.3	-6.1
12:00 PM	69.2	35.0	-6.0	-3.8	-3.4	-6.2
1:00 PM	66.1	44.0	-5.6	-3.6	-3.1	-5.9
2:00 PM	65.2	43.0	-5.6	-3.6	-3.1	-5.9
3:00 PM	65.2	37.0	-5.7	-3.6	-3.2	-6.0

Methodology: To view a UTube Video of Ken Shackel (UCD Irrigation Specialist) demonstrating the pressure chamber measuring STEM water potential in grapes, go to:

<http://www.youtube.com/watch?v=Xe9aWiD6vOw>

Approximate values of water potential (in negative bars) as stress indicators.

Please note: experience in your vineyard will determine values that are acceptable to YOU. Generally, white varieties have lower (less negative) values than red.

Please Note: OPERATOR ERROR can account for inaccurate readings. Make sure you are trained in proper methodology.

Values you use depend on the method of sampling: LEAF vs. STEM (or Petiole). Leaf water potential values are lower (more negative) than equivalent timing for stem water potential.

LEAF Water Potential (Pritchard and Smith):

< -10: no stress;

-10 to -12: mild stress;

-12 to -14: moderate stress;

-14 to -16: high stress;

> -16: severe stress

STEM WP (Shackel):

< -7: no stress;

-7 to -9: mild stress;

-9 to -11: moderate stress;

-11 to -13 high stress;

> -13: severe stress