

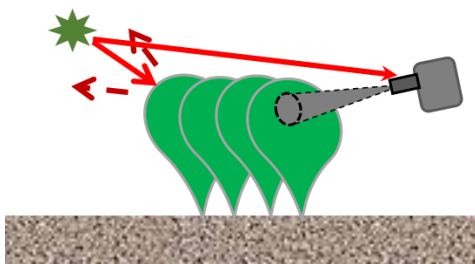
Canopy Temperature Measurements

The temperature of a plant's canopy provides vital information on the water stress and health of the plant.

How is canopy temperature measured?

One method is to use an infrared camera. Although IR cameras can provide excellent images, they are very expensive and time consuming to analyse.

An easier method is to use an infrared canopy temperature sensor. Edaphic Scientific's LT-IR Infrared Canopy Temperature Sensor is designed to continuously monitor the temperature of a tree's canopy in the field.



Leaf-to-Air Temperature Difference

For meaningful interpretation of data, the temperature of a canopy must be related to ambient air temperature. This is known as the Leaf-to-Air, or Canopy-to-Air, temperature difference.

Plants that are healthy show a large difference whereas stressed plants show a smaller difference in temperature. This is because healthy plants are transpiring which cools the canopy and causes a larger temperature difference.

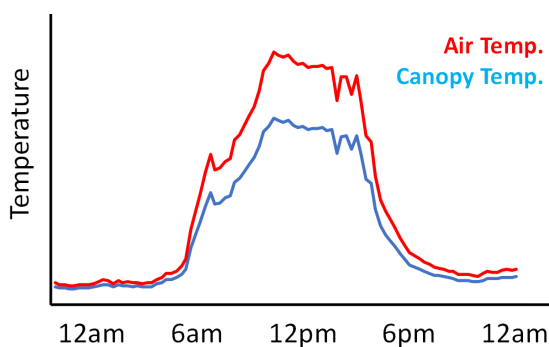


Figure 1. Example canopy and air temperature data.



An alternative to leaf water potential

Continuous measurements of plant water potential are extremely expensive and labour intensive.

Fortunately, scientists have shown that canopy temperature is directly correlated with plant water potential. Therefore, measurements of canopy temperature replace the need to measure plant water potential.

Figure 2 demonstrates the close correlation between canopy temperature and water potential for an almond tree.

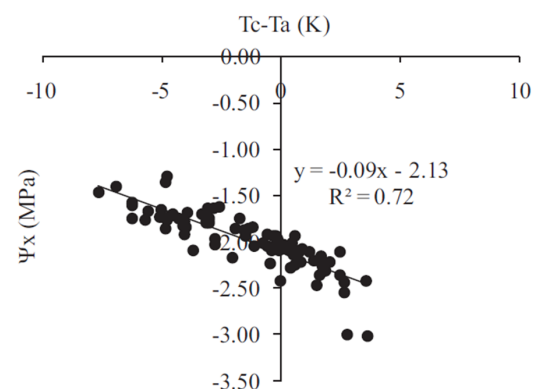


Figure 2. The relationship between canopy temperature (x-axis) and water potential (y-axis) in almonds.

Image source: Gonzalez-Dugo et al, 2012, Fig.5.