

Masters Student Needed ASAP!

Graduate Research Assistant Stipend

Research Topic: Pecan Orchard Irrigation Management

Start this summer

Contact: rjheerem@nmsu.edu or 575--646--2921

Measuring Midday Stem Water Potential With a Pressure Chamber

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Scientific Irrigation Scheduling Options

hVp://weather.nmsu.edu

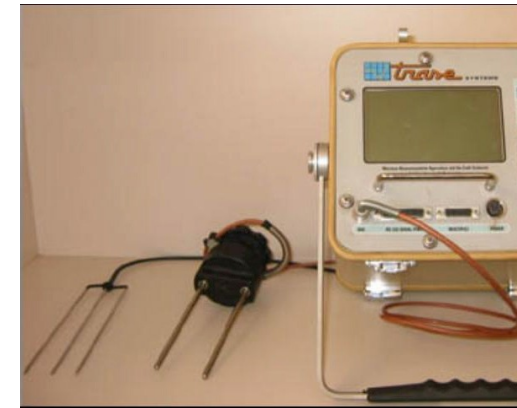
Estimated Evapotranspiration

- Real time: From weather station data
- Long--term historic weather averages

Soil Moisture Monitoring

- Tensiometers
- Electrical Resistance Blocks
- Dielectric Methods

The screenshot shows the NM Climate Center website interface. The header includes the New Mexico State University logo and the text 'New Mexico State University'. Below the header is a navigation menu with links for Home, Weather Data, Products, CoCoRaHS, Skeen Hall Webcam, About Us, and Blog. A search bar is also present. The main content area is titled 'Request Daily Reference ET and GDD Data for Leyendecker PSRC II'. The form includes several input fields and checkboxes: 'Reference ET: Hargreaves and Samani (eth)' (checked), 'PM Short Canopy (eto)' (checked), 'PM Tall Canopy (etr)' (checked), 'Base Temperature' (60), 'Max Cutoff Temperature' (60), 'Min Cutoff Temperature' (-999.0), and 'GDD Offset' (0.0). There are also fields for 'Start Date' (2014-03-16) and 'End Date' (2014-04-16). The 'Output' is set to 'HTML Table' and 'Units' is set to 'English'. A 'Submit' button is at the bottom. A footer note reads: 'For best results, please use a current version of Mozilla Firefox or Google Chrome.' A copyright notice at the bottom left states: '©2014 NMSU Board of Regents - Legal Information'.



Source: Muños-Carpena, 2004 (UF/IF)

Scientific Irrigation Scheduling Options

Or...You can ask the plant!

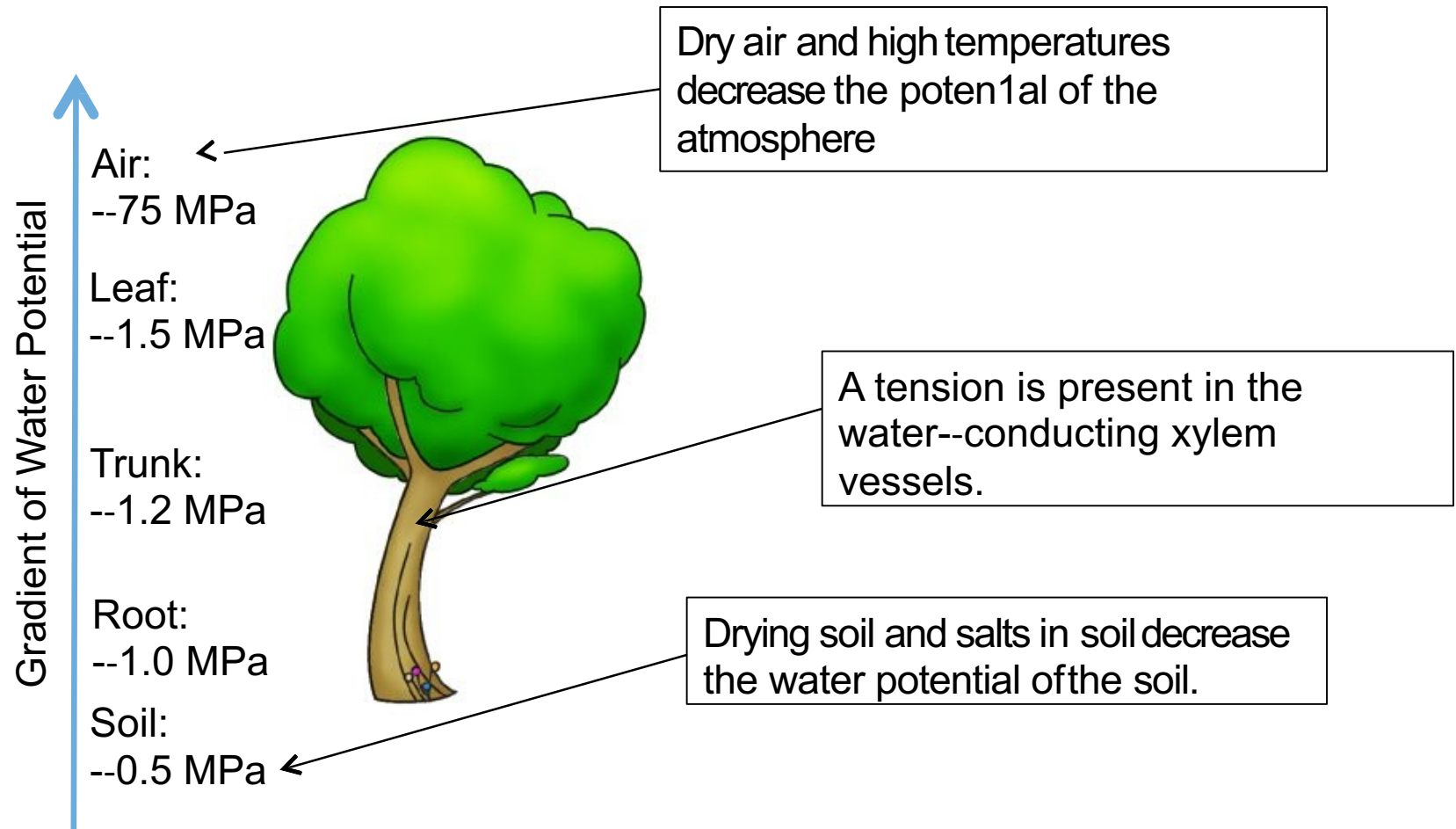
Plant--Based Techniques:

- Leaf or Stem Water Potential gives you the physiological water status of the tree. How thirsty is the tree?

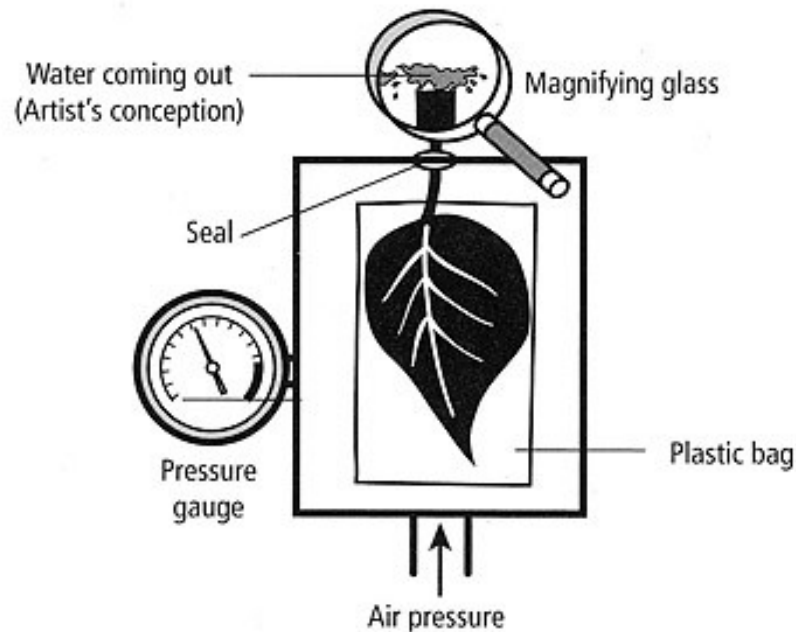
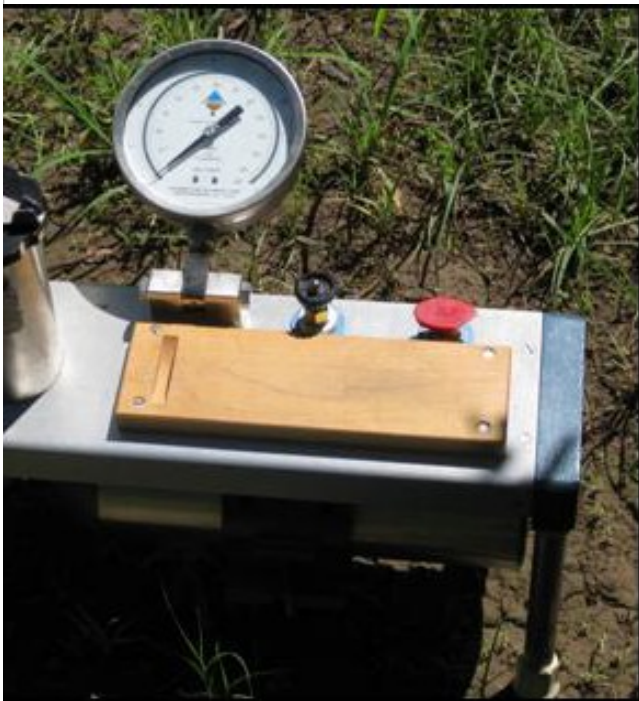


Principle Behind “Water Potential”

Water always moves down a water potential gradient.



The Scholander Pressure Chamber aka The “Pressure Bomb”



The Units:
Megapascal=
10 bars =
145 lb/sq. in

Source: http://fruitsandnuts.ucdavis.edu/pressure_chamber/



<http://pmsinstrument.com/>



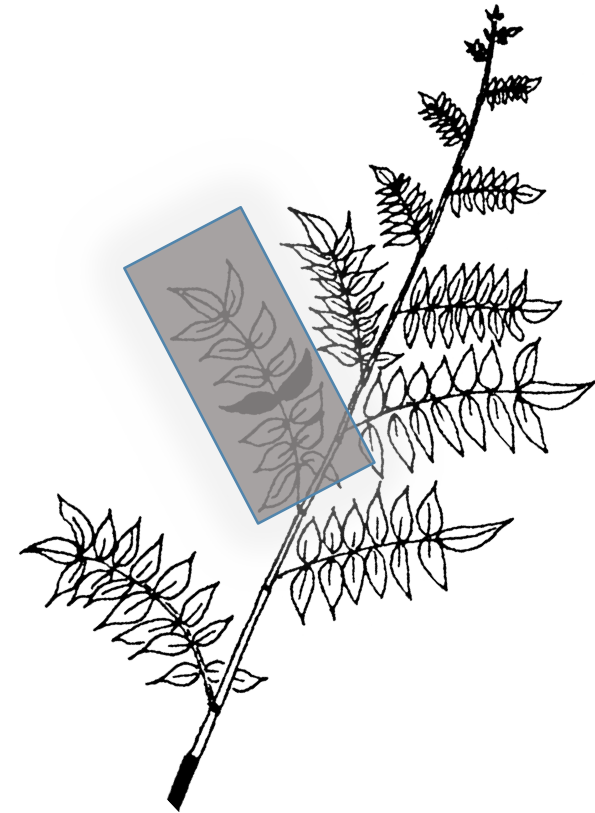
Different ways to measure plant water potential

Leaf Water Potential

Predawn Leaf Water Potential

Shaded Leaf Water Potential

Midday Stem Water Potential



What leaf should we measure?

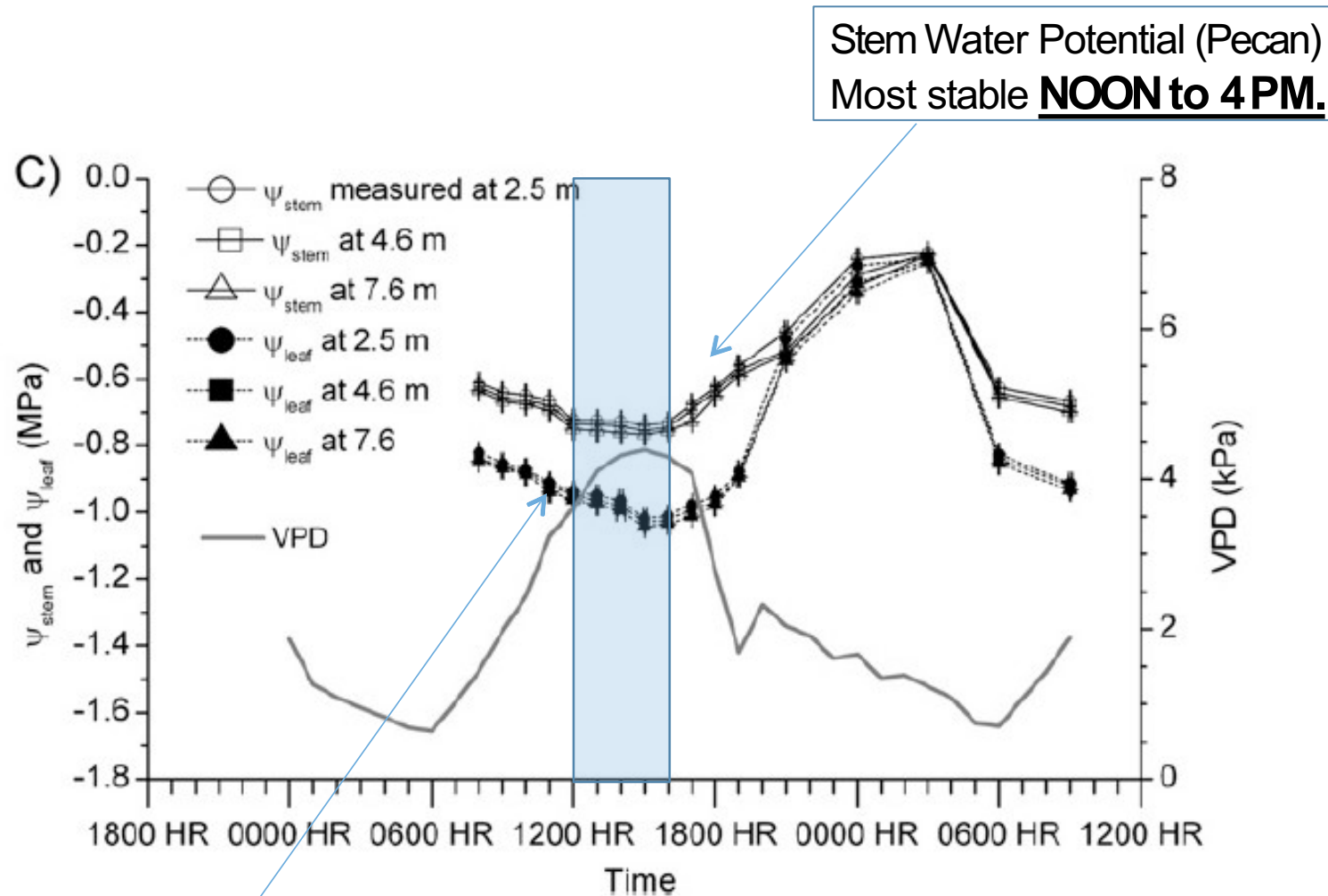
As much as possible, sample the leaves from the lower, shaded part of the canopy— near to the trunk.

Sample mature, healthy, undamaged leaves.

- don't damage the leaves when you're bagging them!

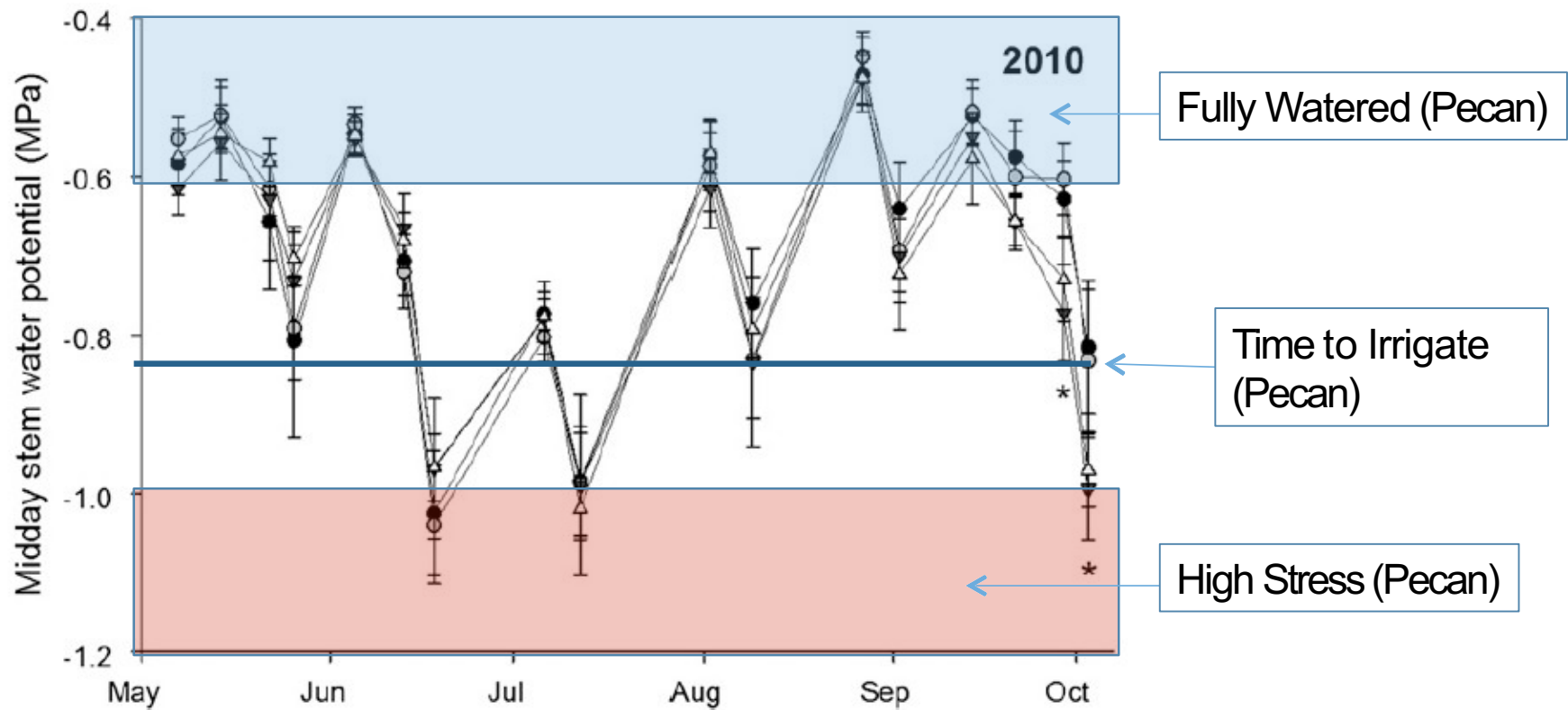


When should *midday* stem water potential be measured?

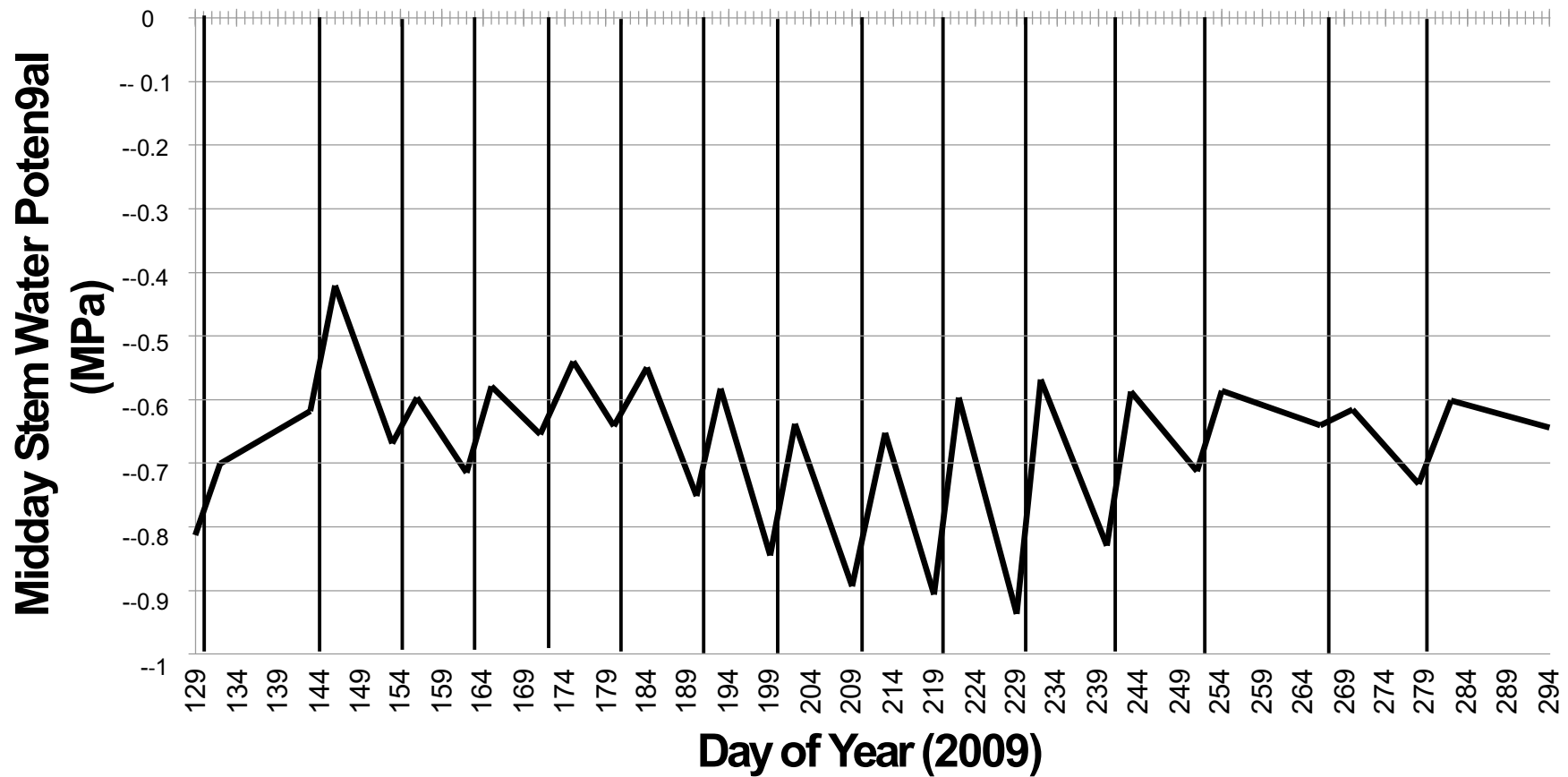


Leaf Water Potential (Pecan)

Midday Stem Water Potential



Water Status of Flood-Irrigated Pecan Trees



Questions?



<http://pmsinstrument.com/>



Midday Stem Water Potential

Midday stem water potential values are influenced by both temperature and relative humidity. The table below gives values of midday stem water potential (in bars) for a fully watered walnut tree under varying conditions of temperature and relative humidity. This value is known as the fully watered baseline.

Temperature (°F)	Air Relative Humidity (RH, %)						
	10	20	30	40	50	60	70
60	-3.8	-3.7	-3.6	-3.5	-3.3	-3.2	-3.1
65	-4.0	-3.9	-3.7	-3.6	-3.5	-3.3	-3.2
70	-4.2	-4.1	-3.9	-3.7	-3.6	-3.4	-3.3
75	-4.5	-4.3	-4.1	-3.9	-3.7	-3.5	-3.3
80	-4.8	-4.6	-4.3	-4.1	-3.9	-3.7	-3.5
85	-5.1	-4.9	-4.6	-4.4	-4.1	-3.8	-3.6
90	-5.6	-5.2	-4.9	-4.6	-4.3	-4.0	-3.7
95	-6.0	-5.7	-5.3	-4.9	-4.6	-4.2	-3.9
100	-6.5	-6.1	-5.7	-5.3	-4.9	-4.5	-4.0
105	-7.2	-6.7	-6.2	-5.7	-5.2	-4.7	-4.2
110	-7.8	-7.3	-6.7	-6.2	-5.6	-5.0	-4.5
115	-8.6	-8.0	-7.3	-6.7	-6.0	-5.4	-4.7
120	-9.5	-8.8	-8.0	-7.3	-6.5	-5.8	-5.0

Plant Moisture Stress PMS Instrument Company)

Model 615 \$3000

Model 600 \$2500 + 260

Pump--up \$1545