

Calibrating Sap-Testing Meters ¹

David Studstill, Eric Simonne, Robert Hochmuth and Teresa Olczyk²

Where to Buy Sap-Testing Meters and Petiole Press

Order by phone, call toll free 1-800-248-8873. Online www.specmeters.com, then click on “Nutrient Management” tab under product line on the left side of the page. Then, click on “plant cardy meters” to give you a full price list of meters and supplies. If you are interested in sap presses, you can click on “hydraulic” or “handheld sap presses” after you click the Nutrient Management tab. (This is not an endorsement of this meter. This information is provided as an example of where to get these meters.)

Supplies Needed

Sap meters; nitrate-nitrogen ($\text{NO}_3\text{-N}$) and potassium (K^+), water bottle with a pointed tip, garlic press, facial tissue paper, tweezers, eye dropper, knife, cutting board, $\text{NO}_3\text{-N}$ standard & slope solutions, and K^+ standard & slope solutions (Figure 1).

Calibrating Nitrate-Nitrogen ($\text{NO}_3\text{-N}$) Meter

Step 1. Take the cardy meter out of the box and turn on the meter (on-off switch located in the upper left top of the meter) (Figure 2).

Step 2. Open the sensor cover flap to expose the sensor pad. If the meter is new, you will have to remove the yellow tab that covers the sensor (Figure 3).

Step 3. Place a small piece of facial tissue that completely covers the sensor (this will greatly reduce the amount of standard solution you will need to use) (Figure 4).

Step 4. Add 3-5 drops of the 450ppm $\text{NO}_3\text{-N}$ standard solution to the tissue and sensor 1ppm=1mg/L. Then, turn the std. wheel located at the top of the meter on the right until the display reads 45 X10, which equals 450ppm (Figure 5).

Step 5. Take the small bottle with a pointed tip and fill it with de-ionized water (if possible) or bottled water. Then, hold the meter vertically and

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1. This document is HS1074, one of a series of the Horticultural Sciences Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date October, 2006. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.
 2. David Studstill, Biological Scientist; Eric Simonne Associate Professor, Horticultural Sciences Department; Robert Hochmuth, Extension Agent IV North Florida Research and Education Center, Live Oak and Teresa Olczyk, Extension Agent III, Miami-Dade County Extension, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611

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gently rinse off the tissue and sensor area (Figure 6).

Caution: Direct water to the sensor area and do not splash water on meter. Also, never dip the meter into water.

Step 6. Gently blot off the sensor area with a facial tissue and place a new piece of tissue back on the sensor (Figure 4).

Step 7. Add 3-5 drops of the 20ppm (1 ppm=1mg/L) $\text{NO}_3\text{-N}$ standard solution to the sensor. Then, open the rubber flap (located to the right of the digital display) and use the blue screwdriver from your kit to turn the screw until the display reads 20 X1, which equals 20ppm (Figure 7). Then, gently close the rubber flap.

Step 8. Take the small bottle of water with pointed tip and gently rinse the tissue and sensor off and take a facial tissue and dry the sensor off. You are now ready to start using the meter for sap testing (Figure 6).

Calibrating Potassium (K^+) Meter

Step 1. Take the cardy meter out of the box and turn on the meter (on-off switch located in the upper left top of the meter) (Figure 2).

Step 2. Open the sensor cover flap to expose the sensor pad. If the meter is new, you will have to remove the yellow tab that covers the sensor (Figure 3).

Step 3. Place a small piece of facial tissue that completely covers the sensor (this will greatly reduce the amount of standard solution you will need to use) (Figure 4).

Step 4. Add 3-5 drops of the 2000ppm K^+ standard solution to the tissue and sensor. Then, turn the std. wheel located at the top of the meter on the right until the display reads 20 X100, which equals 2000ppm (Figure 5).

Step 5. Take the small bottle with a pointed tip and fill it with de-ionized water (if possible) or bottled water. Then, hold the meter vertically and gently rinse off the tissue and sensor area (Figure 6).

Caution: Direct water to the sensor area and do

not splash water on the meter. Also, never dip the meter into water.

Step 6. Gently blot off the sensor area with a tissue and place a new piece of tissue on the sensor (Figure 4).

Step 7. Add 3-5 drops of the 150ppm K^+ standard solution to the sensor. Then, open the rubber flap (located right to the of the digital display) and use the blue screwdriver from your kit to turn the screw until the display reads 15 X10, which equals 150ppm (Figure 7). Then, gently close the rubber flap.

Step 8. Take the small bottle of water with pointed tip and gently rinse the tissue and sensor off and take a facial tissue and dry the sensor off. You are now ready to start using the meter for sap testing (Figure 6).

Helpful Hints

- Make sure that you do not touch the std. wheel (top right of meter) while you are handling the meter. This will cause the meter to lose proper calibration. If you touch the wheel, re-calibrate the meter before you continue sampling.
- Re-calibrate meter after every 20-30 samples or if the meter starts giving strange readings that seem out of the normal range for your samples.
- Make sure that you use the proper standards for each meter.
- Make sure that you wash your knife and press with clean water and dry with a facial tissue between each sample to avoid cross contamination.
- Make sure to turn off the meter.
- **Important; re-calibrate the meter every time you turn the meter on.**
- The digital display will probably not read 0 after you have calibrated the meter.

Additional Reading

Hochmuth, G.J. 2003. Plant Petiole Sap-Testing For Vegetable Crops. UF/IFAS, Fla. Coop. Ext. Serv., Circ. 1144/CV004. <http://edis.ifas.ufl.edu/CV004>.

Hochmuth, G., D. Maynard, C. Vavrina, E. Hanlon, and E. Simonne. 2004. Plant Tissue Analysis and Interpretation for Vegetable Crops in Florida. UF/IFAS, Fla. Coop. Ext. Serv., Circ. HS964/EP081. <http://edis.ifas.ufl.edu/EP081>.



Figure 1. Supplies needed for sap testing.



Figure 2. Remove meter from sap testing kit and turn on.

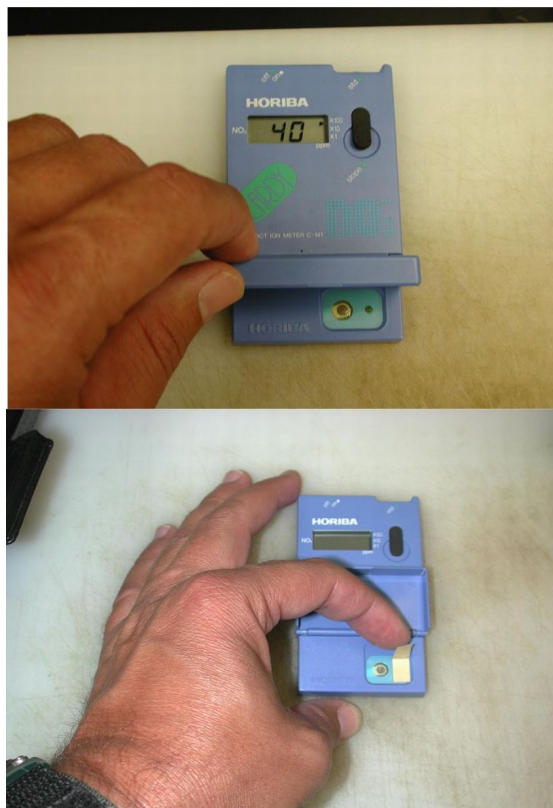


Figure 3. Open up the sensor cover and remove yellow tab (if present).



Figure 4. Place a small piece of tissue on sensor.

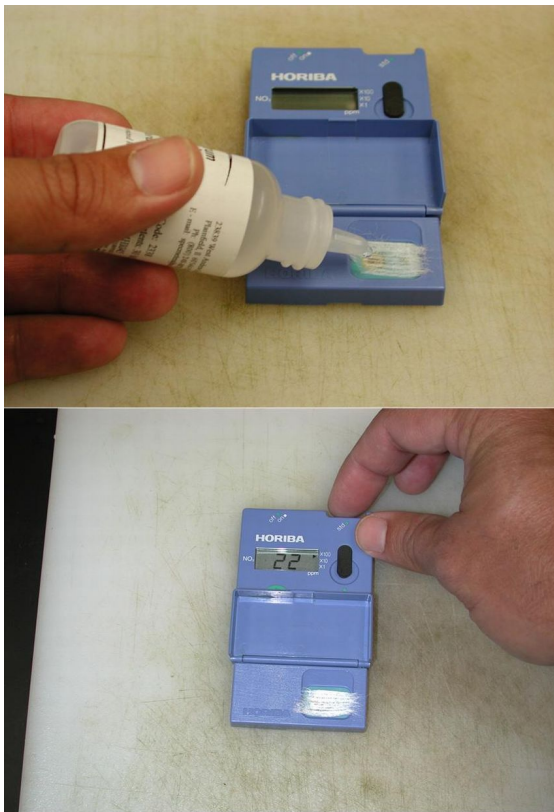


Figure 5. Add 3-5 drops of standard solution on sensor and turn calibration std. wheel until calibration has been achieved.



Figure 6. Hold meter vertically and gently wash tissue and sensor area off using de-ionized water from small water bottle with pointed tip.

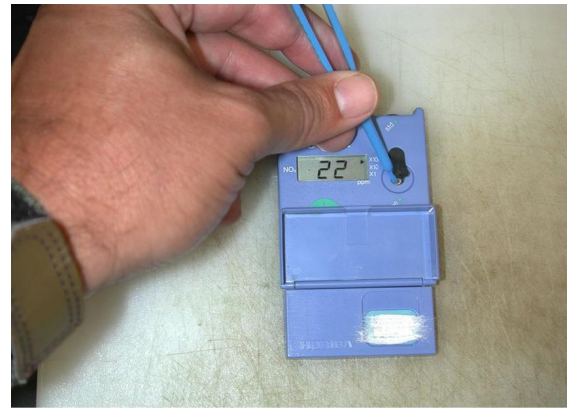


Figure 7. Open rubber flap located to the right of the display window and turn the screw with the blue tweezers from the kit until calibration has been achieved.