

SSAT

LYSIMETER



IRROMETER SSAT suction lysimeters are used for sampling to determine nutrient levels and manage fertigation. A vacuum is placed on the instrument, allowing it to collect soil water for collection and sampling as needed.

SSAT's are available in different lengths to allow for sampling at specific depths, targeted in the active root zone of the crop. For determining sample depth, the following guidelines apply:

- 18" to 24" (45-60 cm) for tree and vine crops
- 12" (30 cm) is ideal for shallower rooted crops
- A deeper instrument can be used to detect nutrient leaching past the root zone

Longer tubes can be used to sample from shorter depths to provide more vacuum capacity. They can be installed at an angle to avoid having too much of the tube exposed above ground to avoid possible accidental damage.

In coarse, rocky, or potting type soils the LT (blue tip) option can help to collect larger sample volumes.

INSTALLATION

SSAT's should be installed in the wetted area of irrigation to ensure adequate water is available for sampling.

To install the SSAT in the soil or container, make a 7/8" (22 mm) diameter access hole to the desired depth with a soil coring tool, IRROMETER Installation tool, a piece of 1/2" galvanized pipe, or 7/8" (22 mm) diameter solid rod. This provides for the necessary close contact with the soil.



In hard or rocky soil, when coring a hole is difficult, a soil auger can be used to make the hole. The removed soil cuttings should be mixed with water to make a heavy slurry to "grout" the SSAT in place to establish good contact. Compact the soil at the surface around the top of the tube to avoid water channeling down the tube to the ceramic tip. Avoid installing in depressions, or low areas, which could retain standing water around the tube.

SAMPLE COLLECTION AND EXTRACTION

COLLECTION

Soil water is collected by putting a vacuum on the instrument, and leaving it to collect.

On shorter SSAT (6" to 12", 15 to 30 cm) versions, the plastic syringe (#DS-50CC) can be used to place a vacuum which can be sufficient in wet soils. For longer instruments or more challenging conditions, the #1002-SSAT hand vacuum pump is recommended.

The vacuum should be applied after an irrigation, when the soil is at or below field capacity (0-30 centibars). Vacuum is applied with the hand vacuum pump (#1002- SSAT) twisted in to the valve (see figure 1) on the end of the tubing with the valve in the open position, handle parallel to the valve body/tubing. If using the double line, use the suction (**long**) line for applying vacuum.

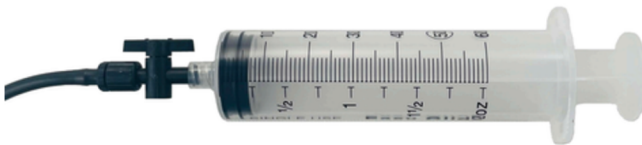


Fig. 1 - Open valve, connected



Fig. 2 - Valve closed

Pump until the vacuum is between 70 and 80 centibars on the pump gauge, then close the valve (see figure 2) The pump can now be twisted off to remove.

The vacuum will draw soil water into the SSAT through the ceramic tip. How long it takes to collect a sufficient sample size depends on how wet the soil is near the tip, how much vacuum is applied to the tube, and the composition of the soil itself. Typically between 4 and 8 hours is required. Keep in mind that the process works in reverse if the soil dries enough, and the sample will be lost back to the soil if tension begins to go above field capacity.

EXTRACTION - SINGLE LINE

After sufficient time has passed to collect a significant volume of water, the vacuum is released by opening the valve. Connect the extraction syringe (DS-50CC) to the tubing by twisting it onto the valve and draw up on the syringe plunger to extract the soil solution. If difficult to extract, twist the rubber stopper loose to make the sample easier to extract.

EXTRACTION - DOUBLE LINE

The Double Line SSAT has two tubing lines:

- Suction line (**long**), which goes all the way down into the tip and is for collecting the soil water sample
- Push line (**short**), for pressurizing the tube to push the sample out

For extraction with the Double Line SSAT, open both valves. The exposed end of the longer suction line should be placed in a collection vessel, such as a sterile bottle or jar. The short or pressure line can be connected to an air pressure source, or the extraction syringe (DS-50CC).

Pull the plunger all the way back, then attach it to the short pressure line valve and slowly depress the plunger to push the collected sample out. To push more air in, detach the syringe before pulling the plunger back to repeat the procedure until the sample is completely extracted. Other air pressure sources, such as a bicycle tire pump or canister of pressurized air can also be used.

As pressure is applied, collected soil water is pushed through the suction line and into the collection vessel. Only a small amount of pressure is needed, otherwise the rubber stopper can be pushed out of the tube. Completely evacuate the tube to prevent contaminating the next sample.

ANALYSIS

Many nutrients as well as salinity (EC) can easily be measured with test kits, handheld meters, or laboratory analysis. Some sources for testing equipment are listed here:

- Spectrum Technologies - 815-436-4440 - www.specmeters.com
- Hach Company - 970-669-3050 - www.hach.com
- Myron L Company - 760-438-2021 - www.myronl.com

irrometer.com



YouTube/@irrometer



irrometer.com/basics



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