



LAQUAtwin usage to control fertilizers for maximizing yield of potato production.

The differences in crop yield between various fields exists. There are many factors but one of the guidance is the control of nutrients. Below shows key nutrients and target value for maximizing potato yield. pH and calcium measurement in soil is critical since it influences the availability of essential nutrients. While nitrate and potassium measurement in fresh sap indicates the amount of nutrient absorbed by the plant, which shows the nutritional state of a culture in real time.

The analyzed sap data from the HORIBA LAQUAtwin is related to the concentration of soil and nutritive solution. Field testing allows growers to identify excess or deficiency before observing the visual sign on the plant. Frequent field analysis helps growers to be more proactive to adjust their fertilization plan.



Benefit to measure nutriments in soil / plant sap

- Immediate responses compare to laboratory analysis that can take weeks.
- Simple and quick measurement that can be done directly in the field.
- Soil / SAP measurement shows how the crop is reacting to the fertilization plan.

Procedure

SAP
1. Select the youngest leaf totally developed, we recommend to sample 10-20 leaves per hectare.
2. Collect the leaves ideally in the morning and always at the same time of the day.
3. Ideal sampling environmental conditions temperature 18 to 25°C and 60 to 85% of relative humidity.
4. With a scissor separate the leave from the petiole and cut the petiole in small pieces.
5. With a garlic press squeeze the petiole to extract the fresh sap.
6. After calibrating the LAQUAtwin meters, place the sap simple and the sensor and take the reading.

SOIL
1. Add 20 mL of deionized water to 20 gram of soil in a glass container. (Dilution 1:1)
2. Stir for 5 minutes (ideally let the mixture rest for an hour).
3. After calibrating the LAQUAtwin meters, take the water phase of soil sample with a pipette and then place a few drops on the sensor.



This video was taken in potato field. You can see sap measurement in the field.

This article shows soil measurement by LAQUAtwin meters. You can see the procedures of calibration and measurement in details.



Nutrients sufficient levels for potato

Measurement of plant sap	Nitrate * NO3-N (ppm)	Potassium * K+ (ppm)
Plants 8-inch tall	1200-1400	4500-5000
First open flowers	1000-1400	4500-5000
50% of flowers open	1000-1200	4000-4500
100% of flowers open	900-1200	3500-4000
Tops falling over	600-900	2500-3000

Measurement of soil	pH **	Calcium *** Ca2+ (ppm)
	pH 4.8-5.5	300 ppm

Sources

* [University of Florida](#)

** [Cornell University](#)

*** [University of Minnesota](#)