

A Comparative Analysis between Test Results of Fertigation Concentration in Irrigation Water Versus Soil Solution

In order to obtain reliable test results of fertigation concentration, the extractors' solution should be sampled at constant periods of time according to the manufacturer's instructions, while in parallel the droppers' or sprinklers' solution should be sampled in the irrigation cycle prior to the sampling of the extractors' solution. The optimal volume of sample solution in an extractor is above 20 ml.

A comparative follow-up of these results should be made. You should pay attention to take note of any significant rise or drop of each and every element, in irrigation water versus the extracted solution, and you should act accordingly.

While fertigation is given proportionally throughout irrigation, any quantity taken at any period of time during irrigation can be used as a sample solution. It is recommended to collect a minimal quantity of 0.5 liter of irrigation solution in a vessel. While fertigaion is not proportional, but is given only at some period of time during irrigation, prepare a vessel large enough (about 10 liters) to collect all irrigation quantity from one representative dropper or sprinkler, and take sample solution from this vessel. It is recommended to put into this vessel the representative sampling dropper or sprinkler fixed by a small flexible pipe to the drip or sprinkling line.

The master parameter in all of these tests is the electric conductivity test (E.C.) in irrigation water (dropper or sprinkler water) and a comparison with the same test in the extracted solution.

For example: when the the electric conductivity in the extracted solution is **higher** than the electric conductivity in the dropper water **in more than 0.5 millimohs/ cm**, you should check the other variable parameters, such as **Nitrogen, Phosphorus, Potassium and so on**, to see if the rise of the electric conductivity results from, or is connected to, a parallel rise in nutrition materials as a result of an accumulation of fertigation excess in the soil solution. In this case, you should lower the general amount of fertigation in the pump, in other words, you should alter the ratio of fertigation solution to water by decreasing fertigation and performing an immediate after-check in the area.

When the concentration of only part of the parameters of nutrition elements or even one of them has significantly increased in the extracted solution compared to dropper water, only these parameters should be reduced in concentration in the fertigation solution, and there is no need to change other parameters which have not significantly changed.

And vice versa: when the electric conductivity of the extractors' solution is **lower** than the electric conductivity of the dropper water by **0.5 millimohs/ cm**, it indicates that there is a high consumption, by the plant, of these nutrition elements, which have decreased and so affected the electric conductivity. In this case you should raise the dose for the benefit of the plant.

In other cases when the rise in the electric conductivity of the extractors' solution does not result from an increase in the concentration of nutrition elements (fertigation), but from other materials, such as: **Chloride, Sodium or both**, you should leach the soil at the active root zone, to avoid an accumulation of too much salinity which interferes with the plant's root's absorbing ability of all important nutrition elements.

The leaching of the soil, noted above, should be carried out through irrigation using a considerable greater amount of water than usual (2 to 3 times the amount). In addition to the electric conductivity tests, you should also check the Chloride concentration in the soil solution and irrigation water, before and after the leach, to see if the Chloride level is back to normal. Also, you should regularly check the Chloride concentration in the soil solution and in irrigation water, to avoid salinity.

The soil solution extractor reflects the nutrition absorption capability of the plant's roots.