



Tomato: cultivation on nutrient solution with higher pH

Aim of the trial

Some bacteria that are beneficial to plants and potentially competing with the harmful pathogen *Agrobacterium rhizogenes* can only develop at a pH value of 6,8 - 7. The aim is to study the possibilities of growing tomatoes with a nutrient solution that has a higher pH by using chelated or combined micronutrient formulations.

General information

Conditions of the trial:

Trial location: France – Pays de la Loire
Soil type: Substrate cultivation in a greenhouse – Hydroponics
In cooperation with: Ctifl

Treatments

2 modalities;

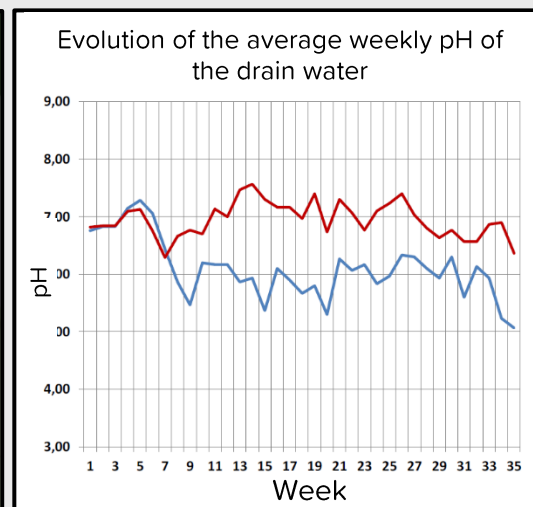
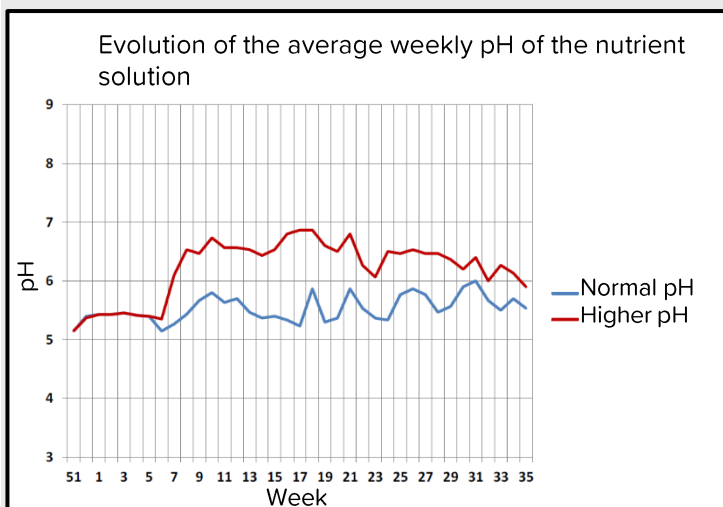
- Normal pH (5,8-6,0) – Classic trace element formulation Kanieltra 0 Fe of YARA + Fe-DTPA
- Higher pH (6,8-7,0) – Formulation of chelated or combined trace elements Chelal Hydro NF + Chelal B of BMS MICRO-NUTRIENTS + Fe-DTPA

The difference in pH of the nutrient solution was started on 6/02/2019.

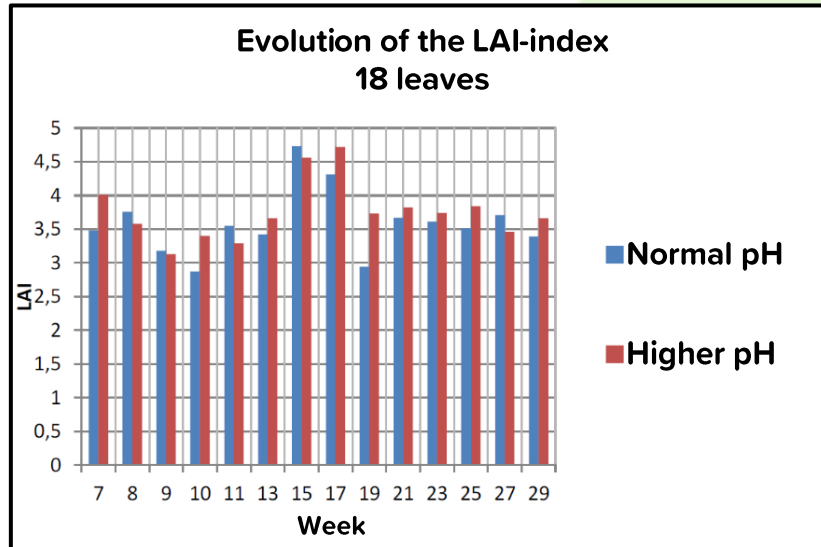
Results

Influence of the pH

| | From 02/01/2019 until 05/02/2019 | | From 06/02/2019 | |
|------------------|----------------------------------|----------------|----------------------|----------------|
| | pH nutrient solution | pH drain water | pH nutrient solution | pH drain water |
| Normal pH | 5,4 | 7,0 | 5,6 | 6,0 |
| Higher pH | 5,4 | 6,9 | 6,4 | 6,9 |



⇒ The experimental design was well respected.



⇒ Similar evolution of the LAI index. Little differences between the 2 modalities.

Other observations:

- Same flowering curve
- No difference in harvest dates
- Slightly stronger growth in the modality with a higher pH (+ 26 cm)
- Comparable evolution of the stem diameter. Little difference between the 2 modalities.

| | On 29/08/2019 | | | | | | |
|---------------------------|---|------|-------|--|---|--|--|
| | Total marketable yield (in kg/m ²) | | | Number of marketable fruits (/m ²) | Average weight of marketable fruit (g) | Average number of fruits per bunch | Number of harvested fruits (/m ²) |
| | Bunch | Bulk | Total | | | | |
| Normal pH | 45,02 | 1,14 | 46,16 | 349 | 132 | 4,9 | 362,1 |
| Higher pH | 45,70 | 1,06 | 46,76 | 350 | 134 | 4,9 | 364,5 |
| Statistical test NK at 5% | NS | NS | NS | NS | NS | NS | NS |
| Variation coefficient | 4,2 | 15,4 | 4,3 | 0,6 | 4 | 0,7 | 0,6 |

- ⇒ No significant difference in marketable yield
- ⇒ Identical yield curves
- ⇒ Identical number of marketable fruits
- ⇒ Little difference in the average weight of the tomatoes

CONCLUSION: No agronomic difference between the two modalities. It is possible to grow tomatoes on a nutrient solution with a higher pH, so that useful bacteria can develop in the root environment and offer protection against pathogens.