

Greenhouse tomato experiments

Huplaso effect on tomato plant

Foreword

The first results obtained of the Huplaso product analysis have shown it has several physicochemical properties involved in the improvement of agricultural soil fertility. Its macro and microelement composition would be able to meet the nutrient requirements of several crop types, while remaining below the metal trace element concentration thresholds imposed in Canada. Greenhouse experiments on tomatoes were conducted to verify Huplaso's agricultural potential as an amendment.

Material and methods

For the greenhouse experiment, Huplaso was compared to a control plant and, for performance analysis, was compared to four other competing products. The agricultural amendment was mixed to obtain a pH between 5.5 and 6.5 in the growth test pots.

Mineral soil used comes from the topsoil of an agricultural parcel in the Baie-du-Petit-Pokemouche region. This soil can be considered poor in terms of nutrients because it has not been amended by fertilizers or other agricultural products. For each treatment, four replicas were observed.

For each substrate created, tomato plant growth monitoring was done in a greenhouse with conditions of 25c and 50% humidity (average values). The tomato variety chosen is Saint Pierre tomato from Chez Caillard in an organic seed form. This variety of vegetable - fruit was chosen for its popularity on the market.

As part of this experiment, tomato seeds were sown on April 11, 2016 and fruits were harvested once mature. Maturity was judged according to the firmness of the fruit as well as its color. At the end of the experiment, all the tomatoes were harvested even if the maturity of the fruits was not reached. In each pot, four tomato seeds were sown; which makes a total of 16 tomato seeds sown per treatment. The last harvest took place on September 9, 2016.

During plant growth, several parameters were observed on a weekly basis: plant height, plant weight at harvest, number of leaves, leaf chlorophyll, and harvest analysis.

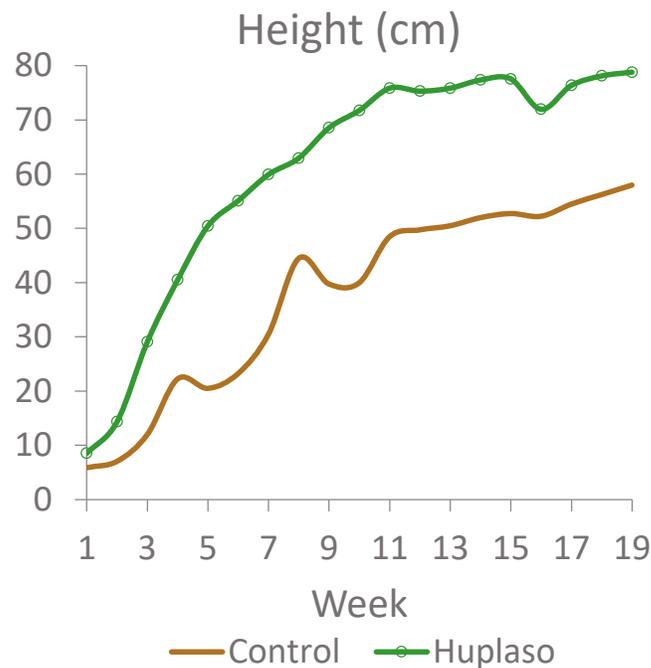
Fruit production varied greatly depending on the treatment. Once the first fruit production is over, the tomato plant tends to wilt. As a result, in the same observation week, some plants were in fruit production while other plants had not yet reached the stage of maturity for the production of tomatoes. In general, the plants produced fruits during the last two months of the experiment.

In order to permit fruit harvest from all treatments, withered stems were cut to prolong the life of the plant and allow the production of new healthy stems. This procedure was applied from the 12th week until the end of the experiment. As a result of this type of intervention, seedlings (some of whose stems had withered) recovered in height, number of leaves and flower production.

Plant height

After germination, the goal being to have just one growing plant per pot, plants considered less beautiful had been torn off at the 4th week of experimentation for the growth monitoring realization. The height of plants was measured over 19 weeks; that is to say until the start of the harvest. Around the 12th week, plants began to wither. Cutting damaged stems allowed the plants to redistribute their energy for growth.

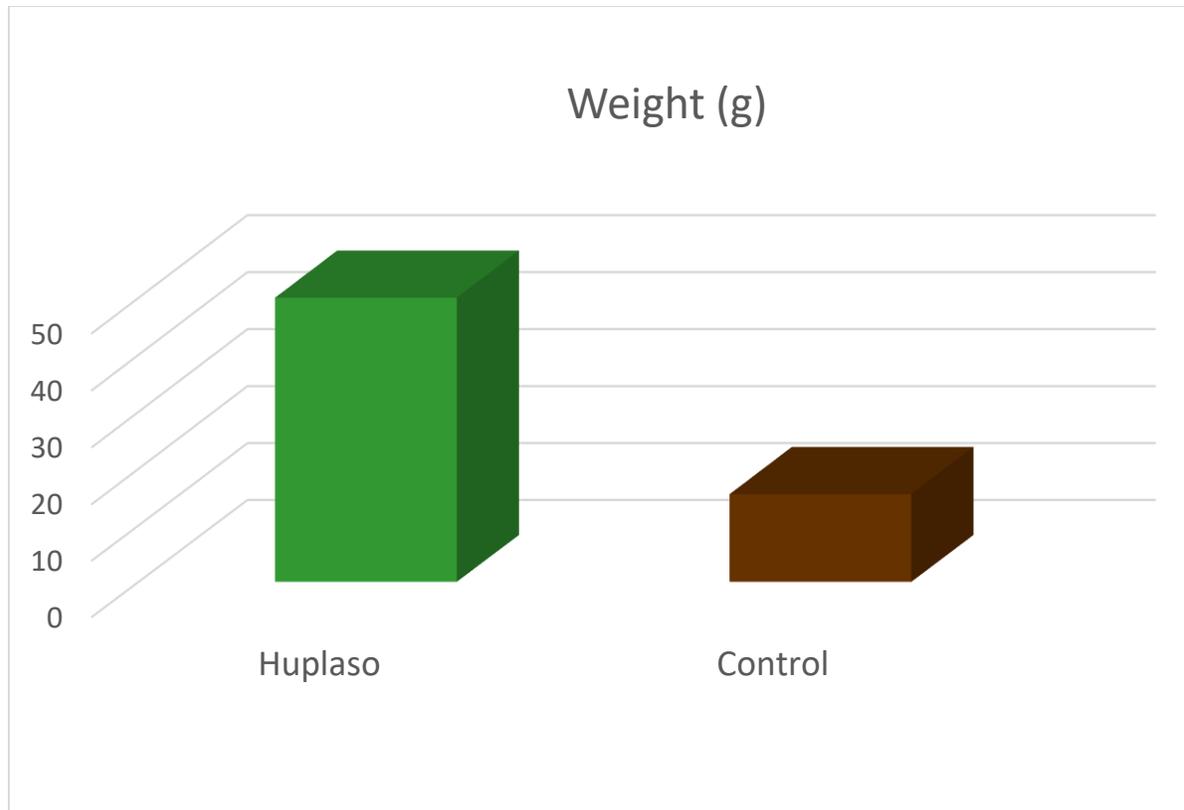
A first comparison with the control substrates shows that with Huplaso, the height of tomato plants is superior in mineral soil.



Weight of plants at harvest

To get an idea of Huplaso's influence on biomass, the mass of plants was measured after the September 9th harvest. The weight of plants, stems and leaves were taken separately from the weight of roots.

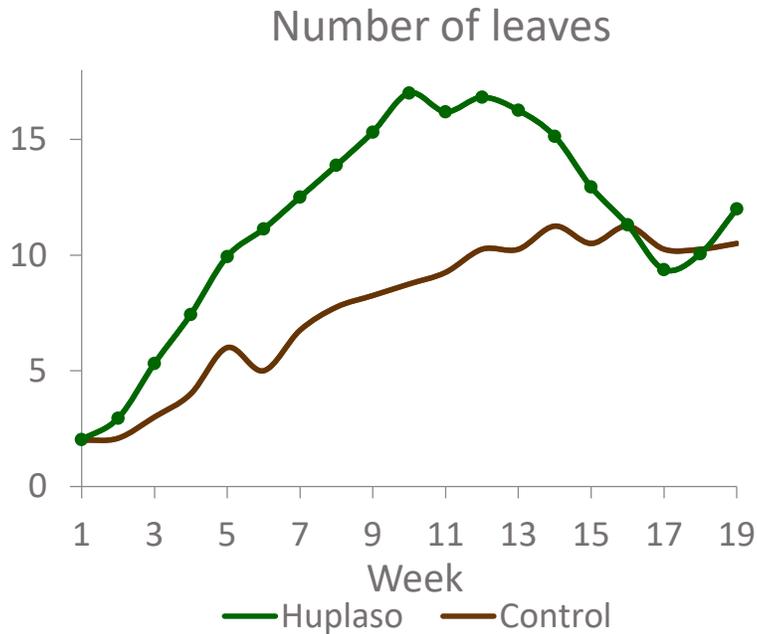
A first comparison with the control treatment shows that the presence of Huplaso significantly increases the biomass produced by tomato plants, 234% more for aboveground biomass and 140% more for root biomass. "



Number of leaves

In each pot, the number of leaves was counted on the three best plants until the end of germination. Note that in the 12th week, tomato plants started to wither. Damaged stems were cut to allow the plants to produce healthy new stems.

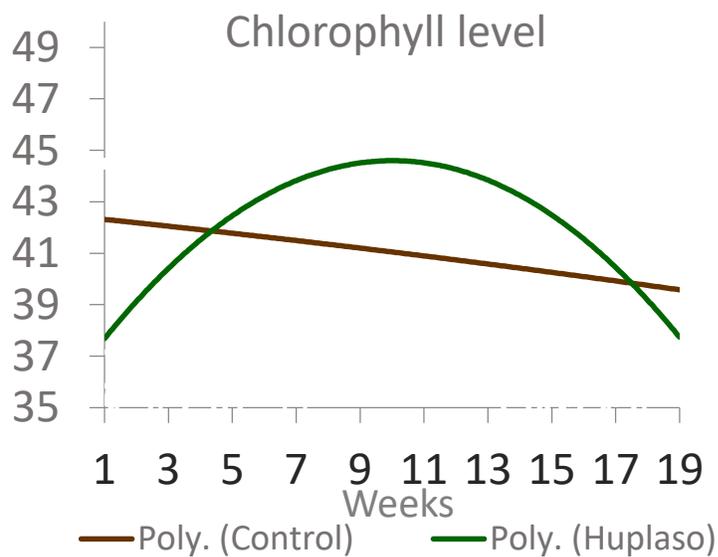
A first comparison with the control plant shows that with the Huplaso product, the number of tomato leaves is greater despite the cutting of the withered stems.



Chlorophyll level

The chlorophyll level is considered as an indicator of plant health. It is also related to the leaf nitrogen content of the plant. As part of the experiment, it was measured weekly, with a SPAD 502 Plus, on the 3rd leaf from the top of the tomato plant.

A first comparison with the control substrates shows that with Huplaso, the chlorophyll level in mineral soil is lower until the 4th week, then it becomes superior to the control substrate until the 12th week to be superior again around the 17th week until the end of the experiment.



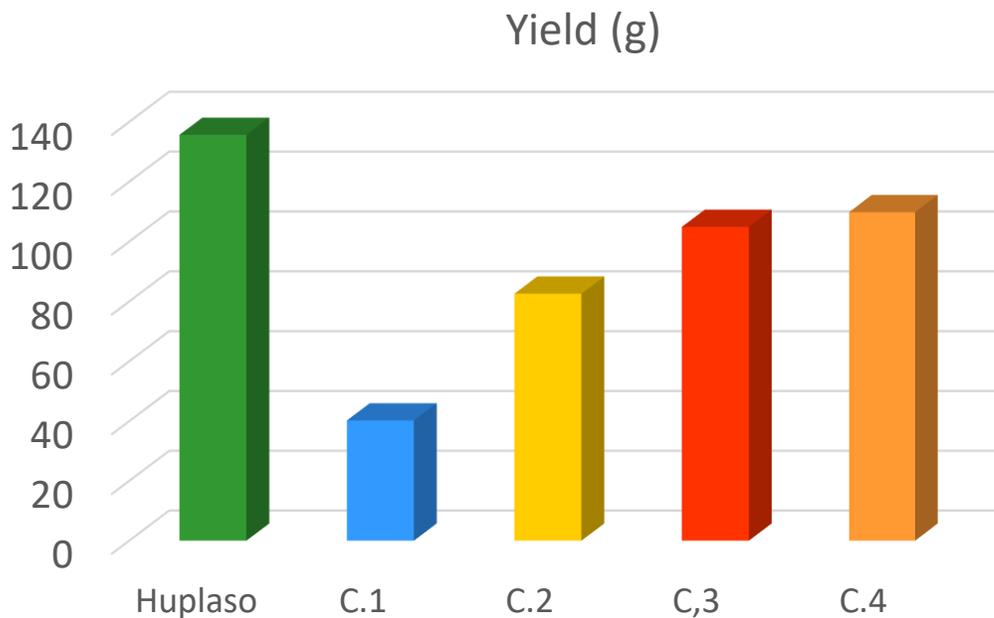
Analysis on harvested fruits

At final harvest on September 9, a total of 80 ripe fruits and 70 non-mature fruits were harvested. The analysis presented below includes ripe and unripe fruits for yield and only ripe fruits for size and diameter.

Yield

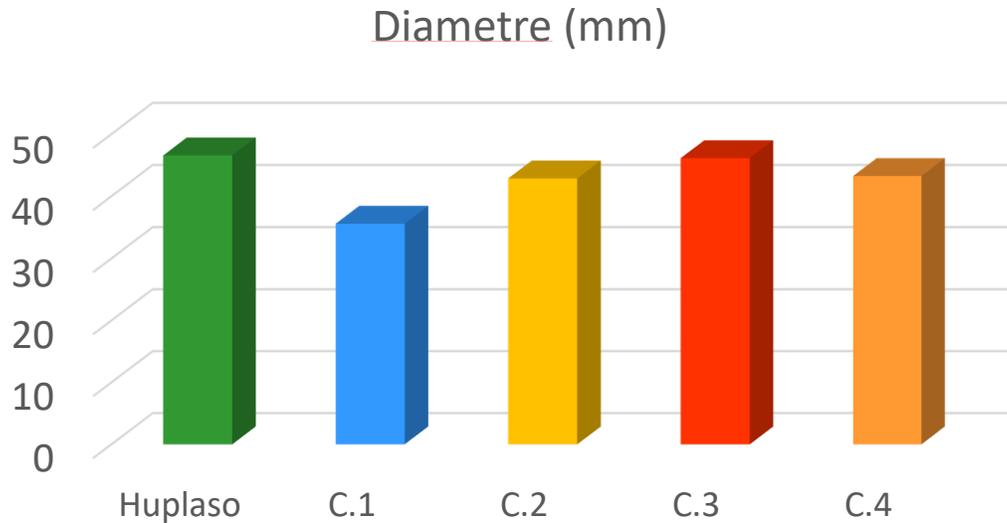
The yield was calculated taking into account the weight of ripe and non-mature fruits produced for all treatments, then divided by the number of replicas observed. Note that no fruit was produced in the mineral soil control treatment.

The Huplaso treatment produced a yield of 135.68g / plant. In increasing order, the other competitive treatments yielded a yield of 40.25g / plant for C.1; 82.60 g / plant for C.2; 104.97g / plant for C.3 and 109.84g / plant for C.4. The results obtained show that our Huplaso product definitely has a superior performance against different competitors. For tomato, yield of the plant is 24% higher than the best of the competitors.



Diameter

The diameter of Huplaso powder treatments varies from 41mm to 51mm. In regards to competitors, their results are the lowest observed.



Quote

Regarding the rating of harvested tomatoes, the numbers 1, 2 and 3 correspond respectively to the commercial quality of the fruit, 3 being the best grade. The criteria used for the rating are worth one point each for the size of the fruit (more than 40 mm in diameter), the shape of the fruit and its uniform color. Given these criteria, there are no Huplaso tomatoes with a rating of less than 2. The average value of Huplaso is 2.4. Only, another competitive treatment stood out with approximately the same quality of value as those of the Huplaso average.



Synthesis

The experiment carried out on the tomato shows conclusive results. The results obtained with Huplaso are superior for the characterization (quotation) of fruits and yield (g / plant). Thus, like the other rock powder, Huplaso could have its place in the agricultural world. Huplaso makes it possible to increase the pH of a soil, to remineralize it thus bringing the necessary nutrients to the growth of a plant. Huplaso stood out in the analysis of harvested fruits, producing a high yield while maintaining superior commercial quality.

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* For ease of understanding, the original term that was basalt powder was replaced by the name Huplaso. *