

GROWING ENGLISH CUCUMBER IN FINE GRADE PERLITE

At an experiment at a commercial grower in Randfontein (Alwyn Steenkamp of Renlyn Engineering Tunnels), two tunnels of English cucumber were grown in fine grade Perlite.

Fine Perlite differs from the coarse grade by the particle size which is less than 1mm Vs Coarse 1-4mm, therefore fine Perlite wet bulk density is higher, which affect its hydroponics application characteristics:

- Very light and requires special care when handled
- Low porosity (aeration)
- High water holding capacity
- Low CEC

About 800 plants per tunnel were sown directly in fine Perlite medium (the medium was irrigated for one day with clean water, prior to sowing). Germination occurred in 3-4 days and a high percentage of germination was noticed (97%). The sown variety was Bowling – a Hygrotech, parthenocarpic type.

The challenge of growing in fine grade Perlite is:

- To overcome its high water holding capacity and so avoid damping and root rot, suggesting that adequate drainage is essential to keep irrigation out-flow dynamics.
- To overcome its “poor” aeration as a substrate with high wet bulk density – this theoretically reduced its porosity and therefore its ability to hold oxygen supply during irrigation.

The disadvantage of a high holding capacity is turned into an

Advantage if the irrigation program is designed to accommodate the medium characteristics. A proper irrigation program can reduce the overall irrigation sessions by half, without affecting the plants development. In simple terms, it means less water is required and therefore less nutrients per irrigation session is used.

Contrary to the theory of “poor” porosity (due to high wet bulk density), fine grade Perlite did not demonstrate a “blocking” pattern which was recorded carefully as drainage per volume (compared with coarse Perlite and sawdust). The reason can be associated with the particles physical behavior to “collapse” towards the point of irrigation (due to water gravitation that pulls the fine Perlite particles downwards). As long as the overall drainage is sufficient, wet particles will create a filter pattern at the point of drainage allowing excess water to move through.

The plants were sown of February 18th and first harvest commenced during the first week of April. Interesting to note, from a comparative point of view:

Since the fine graded Perlite plants were planted at the

Same time as I sawdust, the fine Perlite tunnel plants developed in a uniform pattern with no or very marginal differences across the tunnel with regards to plant height and generative stage.

Plants in the sawdust tunnels demonstrated a lack of uniformity and the generative stage stretched over time due to the plants inconsistent growth.

Thus it can be explained as a result of fluctuations in the overall irrigation program that was designed to accommodate all tunnels irrespective to which medium is used. Sawdust bags went through (as the fine Perlite) periods of “drought” related to changes in irrigation sessions (hot days, cloudy days). The sawdust bag plants – due to the sawdust’s fast drain and low water holding capacity went through periods of stress which impaired the plants development across the sawdust tunnels and within the tunnel. Some plants especially at the tunnel borders dried quicker than the middle ones and showed therefore more stress.

The result, plants developed differently. Due to the medium high water holding capacity the plants grown in fine graded Perlite, the same fluctuations did not have a “drought” effect on the plants and as a results the plants developed in a more uniformed pattern.

The overall production planted in fine graded Perlite versus in sawdust is illustrated here below:

Medium	1st Harvest	Total harvested	Total plants per medium	Average per plant	Days to harvest	Duration of harvest
Sawdust	April 20th	2261	816	2.77	62	23 days
Fine Perlite	April 11th	3329	792	4.20	51	31 days
Coarse perlite	April 16th	2139	796	2.68	58	27 days

Figures are correct as of May 12th, 2011

All plants were sown directly in media: 18th February 2011.

Harvested cucumber refer to marketable size only.

Plants in fine Perlite produced about 65% more than plants in sawdust medial and Coarse perlite.

Duration of available marketable fruit from plant in fine Perlite was longer.

Duration of first harvest from date of sowing with plants in fine Perlite was shorter.



Seedlings in 100%perlite.



Seedlings in Perlite.



Side overview on perlite block.

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After all, when the products you make were formed millions of years ago, then 50 years is only the beginning