

# The Use of TerraCottem® in Ornamental Fern Cultivation

This report clearly demonstrates the benefits of TerraCottem® on plant growth. This scenario only demonstrates one possible application of TerraCottem®, but there are many more. On the one hand, TerraCottem® can either be used from the very beginning in the nurseries as plants of a higher quality will gain more profits. On the other hand, by the end-users as the TerraCottem® treated ferns will be stronger and healthier and will require less maintenance work.

## What is TerraCottem®?



... is a physical soil conditioner  
... was developed at the university of Ghent  
... stimulates biomass production and plant growth  
... increases the water and nutrient retention capacity of soils & substrates  
... is a blend of more than 20 substances, all assisting plant growth in a synergetic way

These substances can be divided in 6 groups:

- 1) Hydroabsorbent polymers
- 2) Soluble mineral fertilisers
- 3) Slow release mineral fertilisers
- 4) Synthetic organic fertilisers
- 5) Carrier material LAVA
- 6) Organic carrier material

- Improve plant and root growth
- Increase germination
- Reduce the volume and frequency of irrigation
- Stimulate microbiological activity
- Increase resistance to drought stress & transplantation shock
- Reduce maintenance costs
- ...

## Test on Ornamental fern (The Netherlands)

### 1. SET-UP

A comparison was made on the effect of 3 types of substrates on plant growth:

- **CONTROL** (poor peat)
- Same potting soil + 7g/l<sup>1</sup> **TERRACOTTEM®**
- Same potting soil + 1g/l<sup>2</sup> of a frequently used **PURE WATERABSORBING POLYMER**



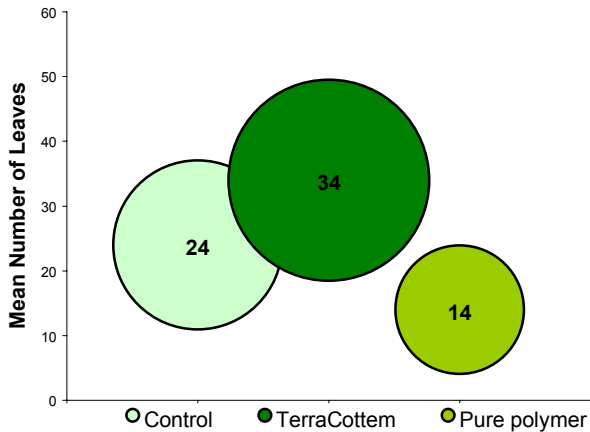
The trial was done on *Nephrolepis exaltata*, var. 'cordatas', a common plant often used in shops, hotels and restaurants. This plant is very sensitive to water stress and nutrient availability. Shortage of water will result in immediate growth slow-down, whereas a shortage of nutrients will result in a rapid change of colour from dark green to light green.

Four replicas were used for every type of substrate. Plant growth was observed by measuring the number of leaves, the length of these leaves and the dry weight production of the aboveground biomass. Afterwards the water use efficiency of every substrate was calculated.

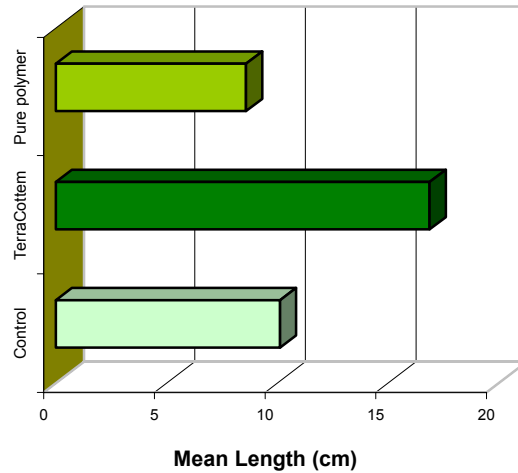
<sup>1, 2</sup> For this application, these application rates were recommended by the producers

## 2. RESULTS

### 2.1 Number of Leaves



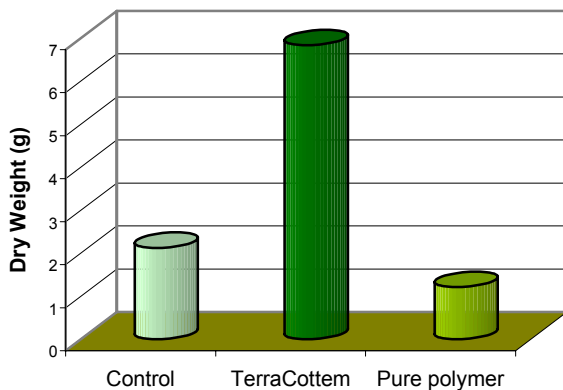
### 2.2 Length of the Leaves



Instead of enhancing plant development, the use of the **pure polymer** has a negative effect on the number of leaves (- 42%) and length (- 15%) of those leaves.

**TERRACOTTEM®** shows a very positive effect on the number of leaves (+ 42%) and on leaf length (+ 67%).

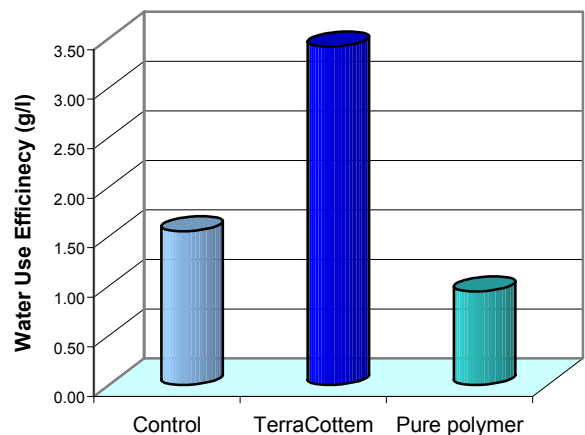
### 2.3 Biomass production (Dry Weight)



Compared to the control plants, the **PURE POLYMER** decreases dry weight biomass production (- 43%).

Compared to the control plants, **TERRACOTTEM®** increases plant growth 3 times (+ 222%).

### 2.4 (Dry Weight -) Water Use Efficiency



The water consumption is not a very good parameter to judge the effect on plant development of a soil conditioner. When the biomass production is low, the transpiration rate of the leaves will automatically be low and this will result in low water consumption. The Water Use Efficiency is therefore preferred as a plant growth parameter. This is the amount of dry weight biomass production (in grams) per litre of water used, with the following formula:

$$\text{Dry Weight Water Use Efficiency (g/l)} = \frac{\text{Dry Weight (g)}}{\text{Total Water Consumption (ml)}} \times 1000$$

The water use efficiency of the **TERRACOTTEM®** – potting soil is 120% higher compared to the control. The potting soil with only the addition of a **PURE POLYMER** has a water use efficiency that is 39% lower than the control.

### CONCLUSIONS:

The use of **TERRACOTTEM®** results in:

- ✗ Number of Leaves: + 42 %
- ✗ Length of Leaves: + 67 %
- ✗ Biomass Production: + 222%
- ✗ Water Use Efficiency: +120%

Thus, **TERRACOTTEM®** gives **bigger, healthier** plants, which require **less maintenance**.