

The effect of TerraCottem® and single polymers on plant growth

Although on the exterior one hydroabsorbant polymer may look similar to another, their chemical construction, the physical structure of the network, and especially the cross linking density can be vastly different and will affect how they absorb, store and release their contents, and will determine their toxicity, longevity and suitability for use in growing plants. Caution must be exercised, as many are sodium-based, manufactured principally for use in baby diapers and other sanitary wares, for use as flocculants and for chemical liquid waste disposal, making them unsuitable for use with plants or turf. Unfortunately, some of these products are repackaged and sold for use in horticulture.

The polymers within the TerraCottem® soil conditioner belong to the propenamide and propenamide-propanoate families. They are Potassium-based and non-toxic. Due to their presence within the TerraCottem® formula, TerraCottem® is sometimes being compared to pure polymers. TerraCottem® is neither a polymer nor a group of polymers. It is a mixture of synergetic substances making it an all-in soil conditioner enhancing the soil's microbiological activity, improving plants' root development, germination, growth and survival rate while reducing the irrigation volume.

What is TerraCottem®?



- ... is a physical soil conditioner
- ... was developed at the university of Ghent
- ... stimulates biomass production and plant growth
- ... increases the capacity of the soil or substrate to retain water and nutrients
- ... is a blend of more than 20 substances, all assisting plant growth in a synergetic way

These substances can be divided in 6 groups:

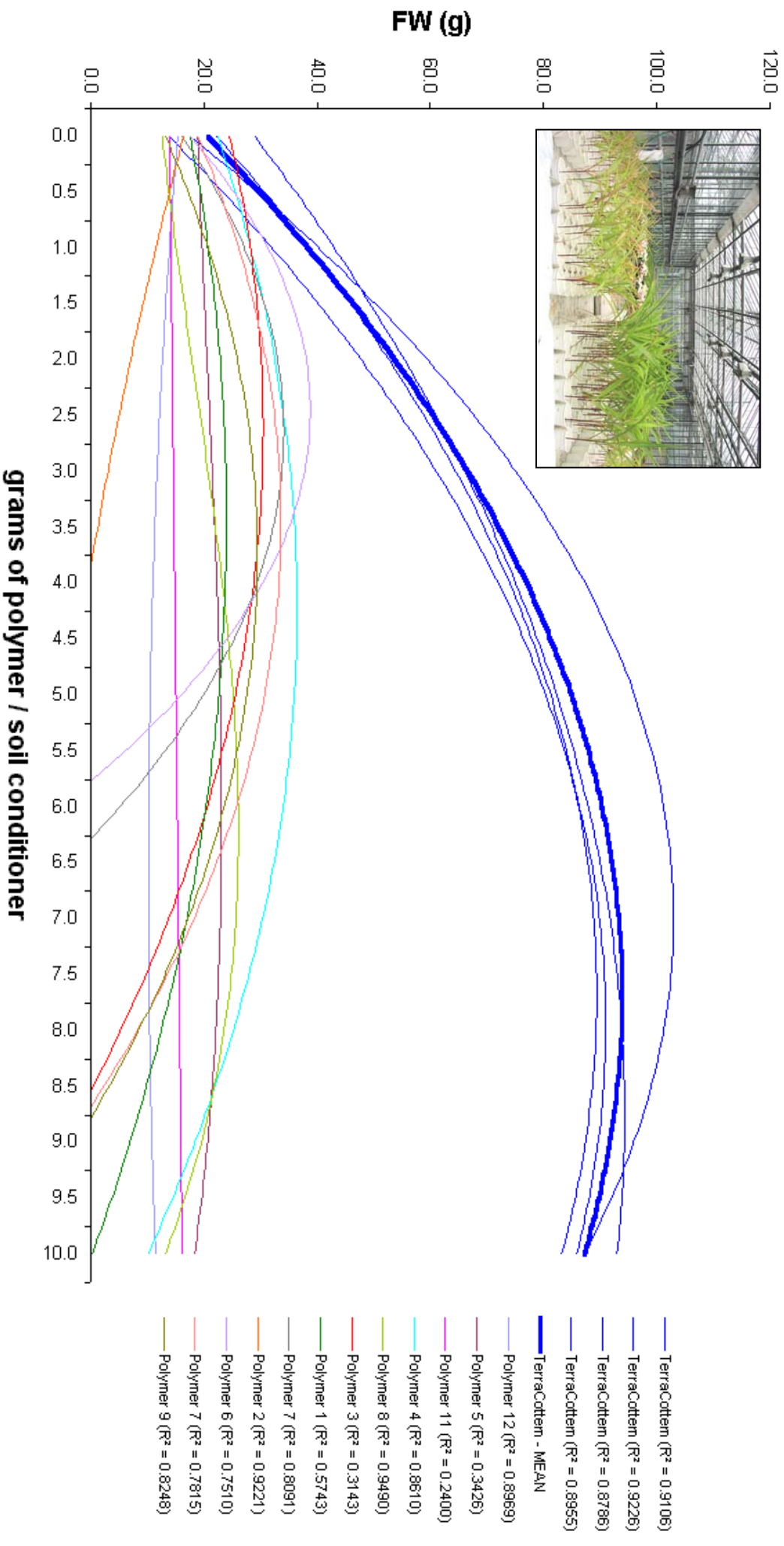
- 1) Hydroabsorbent polymers
- 2) Soluble mineral fertilisers
- 3) Slow release mineral fertilisers
- 4) Synthetic organic fertilisers
- 5) Carrier material LAVA
- 6) Organic carrier material

- Improve plant and root growth
- Increase germination
- Reduce the volume and frequency of necessary irrigation
- Stimulate microbiological activity
- help plants to withstand periods of stress by drought or transplantation
- reduce maintenance costs
- ...

Biomass production of *Zea Mays L.*

Various polymers have been evaluated in bioscreening tests during several years at the Belgian Experimental Station for Ornamental Plants (PCS). Trials were also conducted on the different application rates of these products. At the end of all the bioscreening tests, the effect on plant growth of each polymer was compared to that of TerraCottem®. Those results have been summarised in a graph (see reverse).

The Fresh Weight biomass production or FW (in grams) is placed on the Y-axis. The X-axis shows the results of the different application rates of pure polymers and TerraCottem®, ranging from 0 to 10 grams per kilogram of dune sand with an interval of 0.5 grams. Dune sand was used as a substrate due to its inertness, allowing to measure the effect on plant growth of the substrate mixed with various doses of polymers and TerraCottem®.



The biomass production in the TerraCottem[®] - substrate (dark blue lines) is at each application rate many times higher as compared to the substrates with only pure polymers (other colours). A visual interpretation can be found in the picture: on the right are the pots with different application rates of TerraCottem[®], placed at random, the same application rate of a frequently used pure polymer are on the left.

TerraCottem's recommended application rate for containers is 5g/l soil. However, the biomass production at this rate hasn't reached its maximum yet. A reasonable increase of the rate has a positive impact on plant growth.

Only low application rates of part of the tested polymers have a positive effect on plant growth. However, this effect is many times lower as compared to that of TerraCottem. Some polymers have no effect at all on plant growth and others decrease plant growth. An overdose of the bulk of those polymers kills the plant.