

« Désertification, Sécheresse et Lutte contre la Pauvreté »

« Desertificatie, Droogte en Armoedebestrijding »



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RAPPORT / VERSLAG

Ter gelegenheid van de 10^{de} verjaardag van de Conventie van de Verenigde Naties voor de Strijd tegen Desertificatie (UNCCD - CNULD) en van de werelddag over de Woestijnvorming

À l'occasion du 10^e anniversaire de la Convention des Nations Unies pour la Lutte contre la Désertification (CNULD - UNCCD) et de la journée mondiale de la lutte contre la désertification



22. TC-DIALOGUE - NGO

www.tcdialogue.be

1. Introduction

The widespread ecological, economic and social ruin brought about by drought and desertification has provided the rest of the world with a frightening vision of what can happen when the environment is degraded to a great extent. These conditions prompted Prof. Dr. Willem Van Cotthem and a team of scientists from the Laboratory of Plant Morphology, Systematics and Ecology at the University of Ghent (Belgium) in 1983 to begin researching methods, which would enable plants to grow with a minimal supply of water in the arid Sahelian countries of Western Africa.

Experimenting with a new generation of hydro-absorbent materials, the team from Ghent found that by mixing specific hydroabsorbent polymers, or "hydrogels", with a number of different fertilizers and growth stimulators, a superior soil conditioning compound was attained, which produced dramatic and swift results.

More than ten years of field trials were conclusive: even in the poorest soil conditions a wide variety of indigenous trees, grasses, vegetables and herbs flourished, reversing the devastating pattern of desert encroachment, deforestation and wind erosion. Not only did this TerraCottem[®] mixture significantly improve the capacity of soils to retain water and nutrients, it also promoted biomass production and plant growth. Dr. Van Cotthem's team had discovered a product with universal applications reaching far beyond anything they had imagined...

Encouraged by the results obtained in Africa, with the assistance of colleagues and scientists at other universities, Dr. Van Cotthem evaluated the TerraCottem[®] mixture in other cultivations, climates and circumstances. Utilizing data collected from these experiments with landscaping, sports turf, land reclamation, horticulture, reforestation and others, the TerraCottem[®] mixture was refined, improved and made available on a global scale.

2. What is TerraCottem[®]?

By absorbing water and nutrients, normally lost to runoff or evaporation, and providing plants and turf with a consistent, readily available source of these elements, TerraCottem[®] improves the water retention capacity of soils and growing media, improving soil structure and aeration, increasing root growth, enhancing fertilizer availability and reducing the occurrence of transplantation shock, water stress and resultant plant loss.

The product is specifically suited for application in degraded or problematic soils and root zones with little capillarity, e.g. sandy soils, containers, pots, industrial or municipal areas where little or no maintenance (irrigation, fertilization, soil treatment) is performed, and to improve the quality and performance of substrates.

- A mixture of the best-performing, currently available potassium-based organic hydroabsorbent polymers increases the capacity of soils or substrates to retain and provide water and nutrients.
- A starter component of soluble and slow-release mineral and organic fertilizers plays an important role during the initial growth phase and for many months after.

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- Trace amounts of a growth-stimulating agent encourage extensive root development in the initial growth phase.
 - Carrier material allows for homogeneous distribution of all components and contributes to better aeration.

3. What is TC-Dialogue?

Established in 1995, the non-profit TerraCottem foundation (TC-DIALOGUE) maintains an important link between the soil conditioning method and its origins in United Nations' and other humanitarian projects.

The foundation's mission is to help communities and people, facing ecologic and economic obstacles to become self-sufficient, to improve their environment and to increase their standards of living through the use of the TerraCottem® and other methods.

The foundation allows Dr. Van Cotthem to fulfil his original aim of providing assistance and solutions to humanitarian causes worldwide in combating the major problems facing our world today and in the foreseeable future: hunger, drought and desertification.

TC Dialogue is a non-profit making association, dependent upon sponsorship and donations for its continuing survival and development.

4. Difference between TerraCottem® and pure polymers

The water absorbent polymers within this soil conditioner belong to the propenamide and propenamide-propanoate families. They are potassium-based and non-toxic. Due to their presence within the TerraCottem® compound, it is sometimes compared to pure water absorbent 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 root development, germination, and growth and survival rate, while reducing the irrigation volume.

Although one hydroabsorbent polymer may look similar to any other, their chemical composition, the physical structure of the network and especially the crosslinking density can be vastly different. This will affect the way they absorb, store and release their contents, and it will determine their toxicity, longevity and suitability for application with growing plants. Caution is needed, as many polymers are sodium-based ones, manufactured principally for use in diapers and other sanitary wares, as flocculants and for chemical liquid waste disposal, making them unsuitable for plants or turf. Unfortunately, some of these products are still repackaged and sold for use in horticulture. The TerraCottem® mixture contains potassium-based hydroabsorbent products, that have demonstrated the best results on plant growth and water use efficiency in independent trials.

Years of testing demonstrated that the best results, for a number of plant growth and water-use efficiency parameters, were achieved with a select mixture of hydroabsorbent, nutrient and growth-stimulating components. This mixture became the TerraCottem® product and its changes gradually when more performant components become available. As most of the components in the mixture are not manufactured by the TerraCottem® company itself, new substances, improving TerraCottem®'s performance, can be added or they replace a current component without a conflict of interest. This independence to change and improve the product, often using technology developed by the world's leading

manufacturers, ensures that the TerraCottem® product remains simply a mixture of the best products for the task to be fulfilled anywhere.

5. Some TC - Dialogue projects

5.1 “Keur Bou Naat”, Senegal (2001-2002)



“KEUR BOU NAAT” means “House where all the plants grow”. In collaboration with the local “Women’s Association”, a community garden was created for all women of a suburb of Toubacouta (South Senegal). In November 2001, 42 women of that association started working in this garden, localized close to the centre of the village. Around a well, the women cleared the bush land. Later on, an electric pump was installed in this well in order to facilitate irrigation. Nurseries for

different vegetables and fruit tree saplings were installed. In total, 42 plots were prepared, each consisting of 7 fields of 1 x 10 m, so that every woman has her own ‘garden’. After training (capacity building), the women have spread 100 grams of TerraCottem® per square meter, which were mixed to a depth of 10-15 cm by using a hoe. The plots were then watered and laboured a second time to homogenise the soil again a bit deeper. Thereby, these plots became completely ready to be sown or planted. The women expressed their preference for certain vegetables: tomatoes, onions, lettuce, peppers, hot peppers, eggplants, carrots, radishes and cabbages.

From January 2002 off, all kinds of vegetables and fruit trees are grown in *Keur Bou Naat* with a minimum of irrigation water. A surplus of vegetables is sold to the local market. From time to time, production suffers from infections (fungi, white fly, etc.). After treatment, the local women start producing again with remarkable enthusiasm. With an efficient follow-up, this project is a success story.

5.2 Niou, Burkina Faso (1988-1998)

In 1988, a community garden was created in collaboration with the local Women’s Association “GUESWENDE” and the Dutch NGO “Maastricht-Niou”. The garden has now become a magnificent oasis in the Sahelian landscape. Each woman has her own part of



the garden, where she cultivates different vegetables. Three boreholes in the garden provide sufficient irrigation water during the 8 months of dry season. A part of the garden is kept in its original situation (not treated with TerraCottem® for comparison reasons). Here, more water is needed and the vegetables are significantly smaller.

Onions, lettuce, tomatoes and many other vegetables are growing well with a minimum of irrigation water, thanks to the TerraCottem® - treatment of the fields. As the soil in the garden has been treated with this soil conditioner, Sorghum plants are profiting from the improved soil conditions during the rainy season. The significant difference with the yield of Sorghum on the untreated soil nearby is remarkable.

5.3 Gadap, Pakistan (2001-2002)

In collaboration with the NGO SCOPE PAKISTAN and the local Farmer's Union, a large tomato field was treated with TerraCottem®. Comparison with the surrounding non-treated fields was possible. A comparative costs/benefits - analysis was made.



On July 25th 2001, 4 acres of a sandy loam soil were prepared for the trial. A couple of thousand tomato plants were planted alongside man-made irrigation canals. Per plant 10g of TerraCottem® was evenly mixed with the soil of the plant hole. The duration of the trial was 12 weeks (one growing season). Professor Van Cotthem also advised to plant the tomatoes more effectively by using a vertical hanging method (erect tomato plants by fixing them onto wires). The

observations were spectacular: saving of 50% or more of irrigation water, healthier fruits (resulting in a 25% higher selling prize), increase in tomato production with 295% per acre and finally an increase in the farmer's income by 373%. This was a spectacular success story.

5.4 Himachal Pradesh, India (2001-2002)

In collaboration with the Indian NGO RUCHI and the local Farmer's Union, two small plots of 160 square feet were prepared in 2 villages (Sanaura and Karganoo). In July 2001, 50 tomato saplings were planted in each plot with a spacing of 50 x 38cm. All saplings were 10-12 cm high. In one plot, 10 g of TerraCottem® was applied around the roots of each sapling during



planting, at a depth of approximately 15 cm.

As customary, all plants were watered immediately after planting. During the 12 weeks of growing season, growth was monitored on a fortnightly basis. No supplementary fertilizer was used. In the adjacent control plot, chemical fertilizer was used and pesticide was sprayed as it is traditionally done. The observations were extraordinary: the required irrigation volume was decreased by 60%, the planted saplings' survival rate was increased by 35%, the average production per plant and the average production per hectare was increased, respectively by 60% and 118%. All this resulted in an increase in the farmer's net income after 1 growing season by 150%.

6. TerraCottem® and reforestation

Since its original development at the University of Ghent, aiming at combating desertification in semi-arid regions of Western Africa, the TerraCottem® soil conditioner has gained credibility for its performance and cost-effectiveness in afforestation, reforestation and environmental restoration projects worldwide. By surrounding a sapling's roots with water, nutrients and natural growth stimulating elements, TerraCottem® provides transplanted trees with a significantly higher chance to survive the critical period just after transplanting, and for many years after.

One of the successful reforestation projects was realised in collaboration with the Canadian Cooperation in Burkina Faso and the local Forestry Department of the village of Arbole (Passoré Province, Burkina Faso). Planted with TerraCottem soil conditioner in 1988, the 40-50 cm high saplings of *Acacia nilotica*, *Cassia siamea*, *Azadirachta indica* and *Leucaena leucocephala* continued growing without any irrigation, only depending upon an annual rainfall of some 300-050 mm. In 1998, the trees reached a height of 6-8 meter, which shows clearly that the TerraCottem-method can be classified among the best practices for reforestation. It contributes clearly to conservation and improvement of biodiversity, as many "new" species are nowadays registered on this originally desertified soil.

