

Water Saving for Roadside Plantation using Cocoon Technology

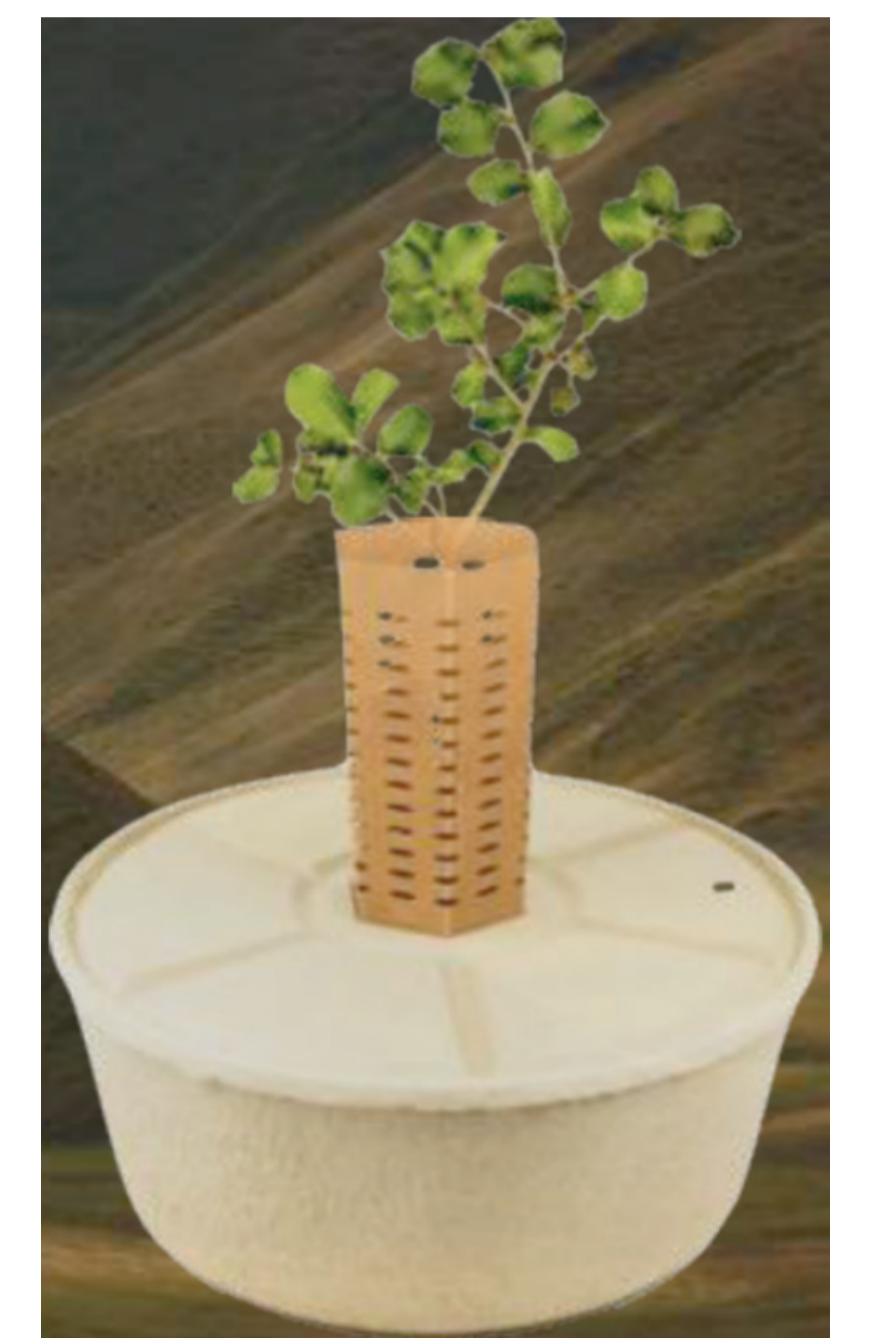
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Introduction

Irrigation for plant growing in arid and semi-arid regions places an extreme burden on water resources and requires the development of sustainable irrigation methods. One of the tools to save irrigation water could be Cocoon, a Land Life Company biodegradable product designed to serve as an incubator for arid tree planting. Land Life Company claims that Cocoon protects and nurtures the plant from seedling to growth with an extreme reduced amount of water – only 23 to 40 liters per tree one-off. In this project we are testing three plant species (*Ziziphus spina christi*; *Prosopis cineraria*; *Azadirachta indica*). It ensures that no weeds can grow in the vicinity of the seedling, taking away competition for water and light and giving the indigenous pioneers a strong start. Furthermore, some natural fungi to support the proliferation of the plant roots are added, which in turn improve drought resilience and nutrient uptake. All these combined factors are considered to increase radically the survival rates, growth rates and vigor of trees planted in marginal lands without the need for irrigation.



Goal

The main goal of this project is to test the applicability of the Cocoon system in Dubai under local conditions and determine the success rates and growth rates of different trees species at ICBA station. If proved successful, the results will be disseminated and shared with various entities within the UAE in order to place the Cocoon in urban areas, with the aim to save irrigation water and protect the environment by reducing sand deposits on the roads and increasing CO₂ sequestration.

Expected outcomes

Proof of the Cocoon concept to be used in public landscaping such as road sides and public parks to reduce irrigation water consumption for landscaping; reduce labor costs for irrigation systems maintenance and road cleaning. Furthermore, if deemed successful for Dubai, possibility to expand the use of Cocoon to residential and agriculture planning. Disseminate and share the results of the testing with relative public agencies in Dubai and the UAE such as Dubai Municipality, Environment Agency - Abu Dhabi and the Ministry of Climate Change and Environment. Communicate the results of the trial on biosalinity newsletter and ICBA website. If system proves to be successful, the following outcomes will be pursued, share the results with local media outlet through a journalist day, organize a strategic planning workshop at ICBA with key entities (Dubai Municipality, Municipalities in the various UAE Emirates, Environment Agency - Abu Dhabi, Ministry of Climate Change and Environment in Dubai) to discuss how this system could be utilized in the UAE.

Methodology and monitoring of experiment

The planting area was identified at ICBA experimental station. The plantation of 260 trees with a space out of 4 meters between the seedlings and 3 meters between rows was accomplished in February 2016. The most common trees used in the highways (*Ziziphus spina christi*, *Azadirachta indica* and *Prosopis cineraria*) are planted. The trees grown in Cocoons are given three treatments; T1) Organic soil life enhancer (*mycorrhizae*, bacteria and fulvic acid); T2) Organic soil life enhancer + Zeoplant; T3) Organic soil life enhancer + Biochar. Control group trees are planted without Cocoon and organic soil life enhancer (T1), in other control treatments (T2, T3) zeoplant and biochar was mixed with soil respectively. Once planted, the trees are monitored monthly (survival rate and vigor) for the first two months, and bimonthly starting from the third month after the planting. Representative plants are marked to observe plant health and SPAD meter readings to determine chlorophyll content. To better understand water discharge from the Cocoon and monitor water level with time, a wireless sensoterra based water level recorder was installed onto the Cocoon's lid. Another 5 sensors were installed in other treatments to monitor soil moisture.



Empty Cocoon with plant



Cocoon filled with one-off water



Planted Cocoon and sensoterra water level recorded

Dissemination of project results

A field demonstration day will be organized in order to share and disseminate the results of Cocoon test with national and local authorities, namely Dubai Municipality, the Environment Agency - Abu Dhabi and the Ministry of Climate Change and Environment. If the system is proved to be successful, a journalist day will be organized with local media as well as a strategic planning workshop to discuss with local and national authorities how to plan Cocoon application in the UAE.