Water-saving techniques for restoring desertified lands: some lessons from the field

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Abstract

In the light of the current climate crisis, one of the most serious ecological threats is the increase of desertification. In this context, restoration projects are necessary for reverting land degradation, and nature-based solutions could help them. The Cocoon has been designed as a new ecotechnology for improving seedling establishment. The Cocoon consists of a donut-shaped container made out of recycled cardboard that provides water and shelter to the seedling, at least during its first year, which is the most critical for plant establishment. The Cocoon was tested on a variety of soils, Mediterranean mesoclimates, vegetation and land uses that allowed testing the effectiveness of this ecotechnology under different conditions. Six planting trials, five of them in Spain (Canary Islands, Almería, Catalonia and two in Valencia), and one in Ptolemais (Greece), were performed. With the objective of studying its functionality, the survival of the seedlings, their vigor and growth were monitored along two years. In general, the Cocoon has proven its effectiveness by increasing seedling survival compared to the conventional planting system, especially under dry growing conditions (low rainfall, soils with low water holding capacity). The Cocoon also allowed for higher growth of some species (olive trees, olm oaks and Aleppo pines). Moreover, a positive correlation between the rainfall on the site and the degradation degree of the Cocoon device was observed. Overall, the Cocoon becomes more efficient the more arid the climate or the more difficult the growing conditions are.

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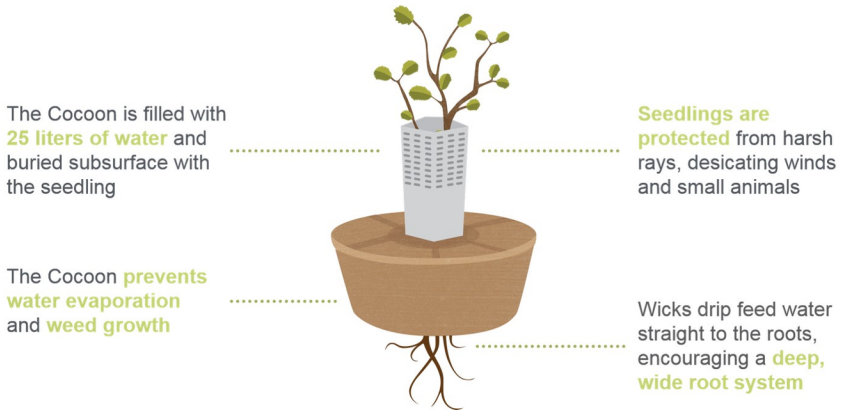
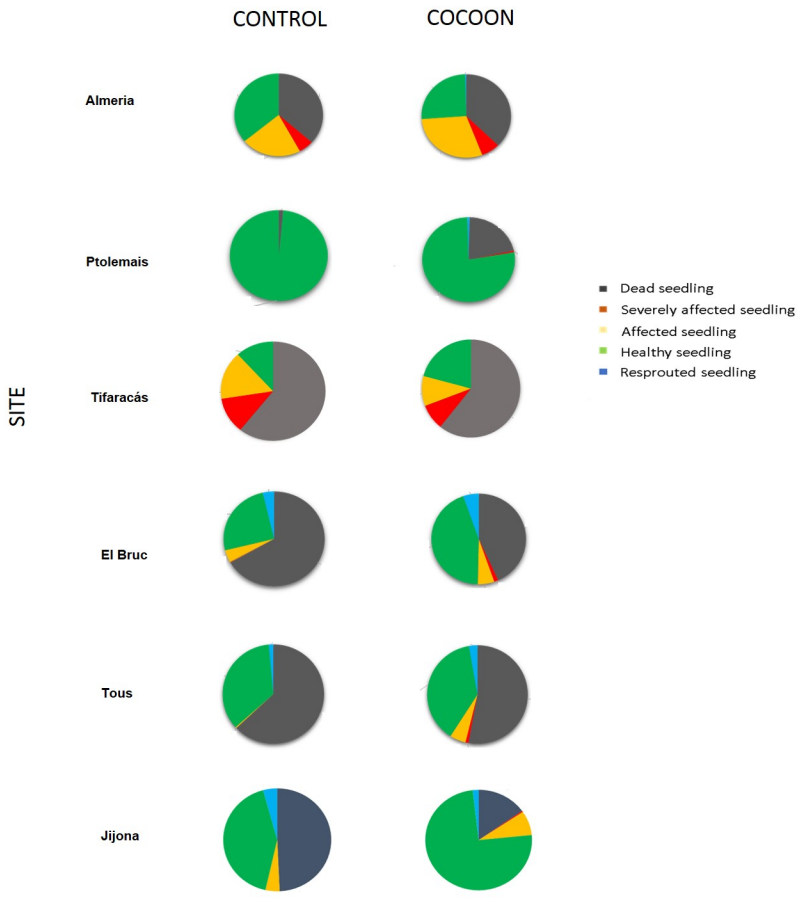
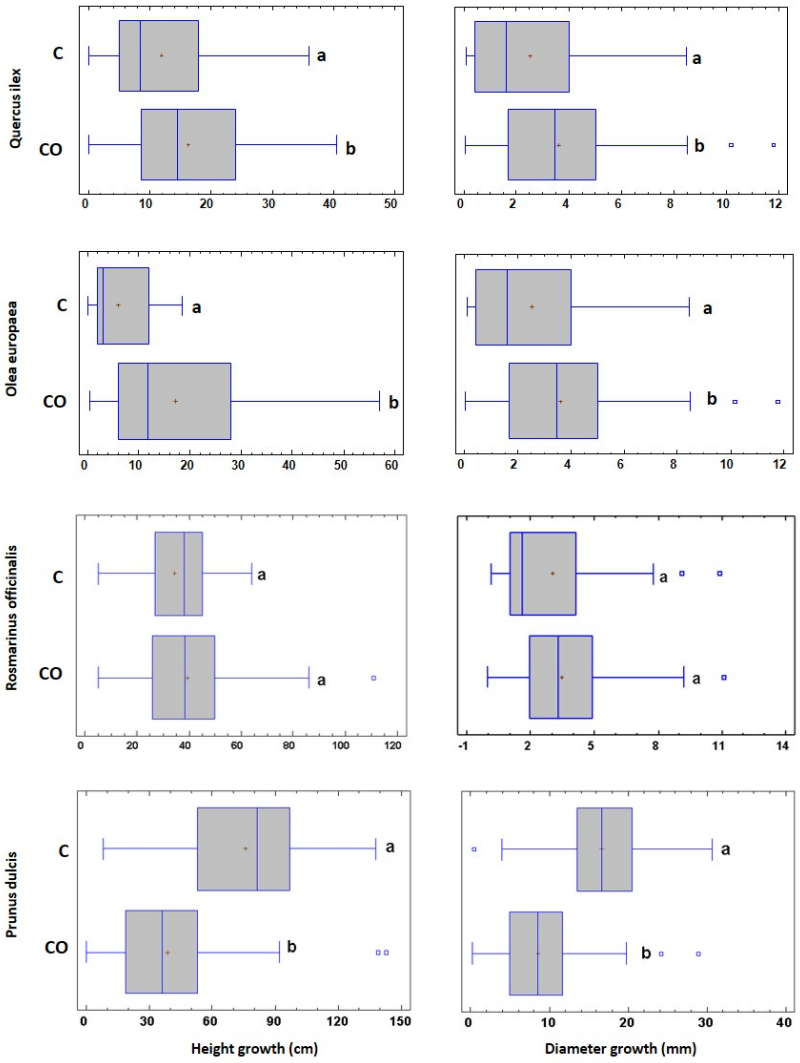
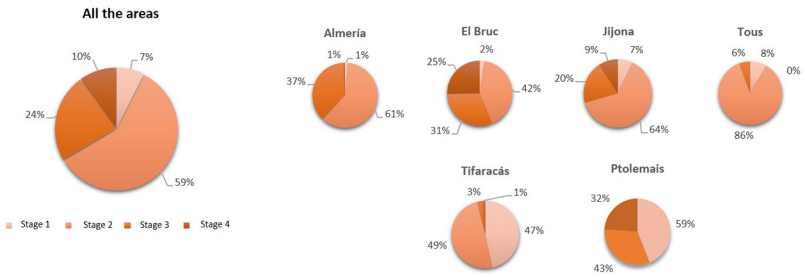
`Restoring degraded areas with the Cocoon ecotechnology_v4_sense figures.pdf` available at https://authorea.com/users/408745/articles/518635-water-saving-techniques-for-restoring-desertified-lands-some-lessons-from-the-field









Lid collapse (Stage 2)

Color change (Stage 2)

Bowl with signs of degradation (Stage 3)

Cocoon filled by run-off and rain water