

Agriculture and Climate Change - Adapting Crops to Increased Uncertainty (AGRI 2015)

Screening of elite and local taro (*Colocasia esculenta*) cultivars for drought tolerance

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Abstract

Taro (*Colocasia esculenta* (L.) Schott) is a vegetative propagated tropical root occupying the 9th position among world food crops. Taro is an important staple food for many local populations of Asia and Africa. The crop is dependent of wet and highly irrigated growth conditions. Under the scenario of undergoing climatic changes, is estimated that taro production could decrease in the next 30 years as result of drought constraints. The project EU Aid Taro, DCI-Food/2009/45 “adapting propagated crops to climatic and commercial changes” aims to study ways to adapt this clonally propagated root to these climatic changes.

A set of drought stress assays were realized at ISOPlexis Genebank (Madeira University), using local taro cultivars (Macaronesian taro genepool) and elite cultivars and seedlings provided by the Secretariat of the Pacific Community (SPC). The 1st pilot assay was realized in a small greenhouse, included 3 local cultivars and aimed to modelate the watering regimes and their influence on crop growth. The 2nd full assay was realized in two greenhouses, during a full plant growth cycle. Thirty four taro cultivars, 15 elite lines provided by SPC, and 19 local cultivars, from Madeira (10), Canary Islands (6), Azores (2), and Cyprus (1) were screened. Plants were individually cultivated in pots under 2 contrasting watering regimes, high (0,36 liters/day) and low (0,18 liters/day). Data for 14 morpho-agronomic traits, biomass and yield parameters were collected from 5 plants for each cultivar, per treatment.

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Preliminary results show significant differences in the ability to cope with drought stress among elite and local varieties. A classification of cultivars according to their relative drought tolerance was made. The most resilient of these varieties will be subject to a new complete assay, in order to better assess their level of tolerance and recommend for breeding programs in Asian countries.

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Peer-review under responsibility of the organizing committee of the Agriculture and Climate Change - Adapting Crops to Increased Uncertainty (AGRI 2015)

Keywords: Taro (*Colocasia esculenta* (L.) Schott); Drought stress; Stress Susceptibility Index; Stress Tolerance Index; Water Use Efficiency; Harvest Index

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