



Tropentag, October 6-8, 2009, Hamburg

“Biophysical and Socio-economic Frame Conditions  
for the Sustainable Management  
of Natural Resources”

## Salt Stress Effects on Cowpea (*Vigna unguiculata* L. Walp) Varieties at Different Growing Stages

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### Abstract

In Cuba approximately 228,000 ha of agricultural soils are affected by salt. This amounts nearly 23 % of the total Cuban area. The cultivation of salt tolerant genotypes is an economical and environmental useful method to mitigate the salt stress effects. Cowpea (*Vigna unguiculata* L. Walp.) is adapted on different environmental conditions, and could be used as an alternative crop for salt affected soils. The objective of the study was to evaluate the salt tolerance of cowpea varieties at different growing stages within three consecutive experiments. The first experience was established under laboratory conditions to determine the response of twelve varieties on different salts levels during germination stage. Seed water absorption, lengths of hypocotyls and radicles and weights of seedlings were measured. The second experiment was established in a green house under semi controlled conditions to evaluate the salt effects on plant physiological and morphological parameters. The length and wide of stem, number of leaves, shoot dry mass, and activities of dehydrogenase and phosphatase in soil were measured.

In the field, cowpea was cultivated to investigate the yield parameters for one non affected soil (1.3 dS m<sup>-1</sup>) and one affected soil (9.8 dS m<sup>-1</sup>).

Differences in varieties response to saline levels were found during the germination. Through a cluster analysis based on euclidian distance, four groups were formed to characterise the tolerance. Among others, IT 86 D-715, Cancarro and Cubanita-666 were classified as tolerant. IT 86 D-386 and IITA-Precoz were found to be most susceptible. A linear negative correlation between the salts levels and the germination parameters was found. In the green house experiment the crop growth were affected negatively by salt. However, the activities of dehydrogenase and phosphatase reacted differently on salt content, and depended more on the varieties cultivated than on the salt effects. In the field IT 86 D-715 was found to be most tolerant to salt stress. Generally, the results showed that the selection of salt tolerant varieties plays an important role to establish salt adapted cropping systems.

**Keywords:** Cowpea, germination, salt stress