



Tropentag, September 17-19, 2014, Prague, Czech Republic

“Bridging the gap between increasing knowledge and decreasing resources”

Chenopodium quinoa as a New Non-Traditional Crop in Egypt

SAYED EISA¹, AHMED ABDEL-ATI², MOHAMED EBRAHIM¹, MOHAMED EID³, EMAD EL-DIN ABD EL-SAMAD⁴, SAYED HUSSIN¹, NASR EL-BORDENY⁵, SAFWAT ALI⁶, ABD-EL-RAHMAN EL-NAGGAR¹

¹*Ain Shams University (ASU), Dept. of Agricultural Botany, Egypt*

²*Desert Research Center, Plant Production Dept., Ecology & Dry Land Agriculture Division, Egypt*

³*Ain Shams University, Dept. of Soil Science, Egypt*

⁴*National Research Center, Vegetable Crop Research Dept., Agricultural & Biological Research Division, Egypt*

⁵*Ain Shams University (ASU), Dept. of Animal Production, Egypt*

⁶*Ain Shams University (ASU), Dept. of Agricultural Biochemistry, Egypt*

Abstract

Dry land salinity increasingly affect large tracts of agriculture land in Egypt. Efforts are hence needed to find alternate solutions to allow farmers to make productive use of saline land. One option is the use of high potentiality halophytes for crop production. *Chenopodium quinoa* Willd is one of the promising halophyte cash crops for cultivation on saline soils. The aim of this study was to compare the potential seed yield and quality of quinoa grown under high saline soil conditions ($EC_e=27\text{ ds.m}^{-1}$) with neutral-soil conditions ($EC_e=1.9\text{ ds.m}^{-1}$). Seed yield and weight of 1000 seeds significantly decreased under saline-soil to record 40 % and 20 % reduction compared with neutral-soil conditions, respectively. Beside quantity, the composition of reserves also changed under saline conditions. The concentration of the total carbohydrates decreased significantly whereas, concentration of protein, Fe, Na and ash increased significantly in seeds. No significant differences were found for oil, fiber, P and K contents under saline conditions. However, the higher accumulation of ash in seeds under saline condition was not obtained solely by an increase of Na concentration; it was achieved also by increasing K and Fe concentrations. The Energy Dispersive X-ray microanalysis clearly indicated that the passage of Na to seed interior was hindered by seed pericarp leading to low accumulation of Na in seed interior reserving tissue. Quinoa as a new cultivated halophyte cash crop has a potential as grain crop under saline conditions due to its high nutritional quality of seeds.

Keywords: *Chenopodium quinoa*, halophyte cash crop, nutritional value, saline soil, yield