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The Potential of Cash Crop Halophytes to Maintain Yields and Reclaim Saline Soils in Arid Areas

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Abstract

About 7 % of the world´s total land area is affected by salt, as is a similar percentage of its arable land. When soils in arid regions of the world are irrigated, solutes from the irrigation water can eventually reach levels that have an adverse affect on plant growth. There are often not sufficient reservoirs of freshwater available and most of the agronomically used irrigation systems are leading to a permanent increase in the soil-salinity and step by step to growth conditions unacceptable for most of the conventional glycophytic crops. Although careful water management practices can avoid, or even reclaim damaged land, the sustainable use of halophytic crop varieties that can maintain yields in saline soils or allow the more effective use of poor quality irrigation water will have an increasing role in agricultural land use in near future. A screening procedure is a practical first step on the selection of economically and ecologically important crop halophytes. This quick check system bases on the four major constraints for plant growth on saline substrates: water deficit, restriction in the uptake of CO_2, ion toxicity and nutrient imbalance. It comprises the study of the individual physiological and anatomical adaptations to counter the dual hazards of water deficit and ion toxicity.

Informations about the essential eco-physiological needs of several salt and drought resistant crops (such as *Beta vulgaris* and *Chenopodium quinoa*) and halophytes (such as *Atriplex nummularia* and *Spartina townsendii*) will be presented. Their characteristic combination of mechanisms against salt or drought injury will be discussed.

Keywords: Atriplex, *Beta vulgaris*, cash crop halophyte, *Chenopodium quinoa*, drought, NaCl tolerance, quick check system, *Spartina*

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