



“Gheorghe Asachi” Technical University of Iasi, Romania



RESPONSE OF UPLAND COTTON GENOTYPES TO SALINITY AT EARLY GROWTH STAGES

Zarina Bibi¹, Naqib Ullah Khan^{2*}, Qudrat Ullah Khan¹, Muhammad Jamil Khan¹
Imdad Ullah Khan¹, Muhammad Jamal Khan², Muhammad Sayyar Khan²
Safdar Hussain Shah²

¹Department of Soil and Environmental Sciences, Gomal University, Dera Ismail Khan, Pakistan
²The University of Agriculture, Peshawar, Pakistan

Abstract

Salt tolerance was studied in eight upland cotton cultivars (CIM-446, CIM-473, CIM-496, CIM-499, CIM-506, CIM-554, CIM-707 and SLH-284) under control and four NaCl salinity concentrations (50, 100, 150 and 200 mM). Significant ($p \leq 0.01$) variations were observed among cultivars, salinity concentrations, and cultivar by salinity interactions for various growth traits and ions (K^+ and Na^+) accumulation in dry shoot and root tissues. As compared to control, the growth variables were decreased by increasing concentrations of NaCl, however, greatest reduction was observed at 200 mM salinity stress. The uptake of K^+ and Na^+ were inversely proportional, and Na^+ accumulation was least in control and gradually increased as salinity application increased. The K^+ absorption was highest in control and gradually decreased through increased salinity in shoot and root tissues. The foliage has more capacity for Na^+ accumulation than roots which ensured increased K^+ absorption in roots. The K^+/Na^+ ratio of various genotypes differed significantly at various NaCl concentrations. Cultivar CIM-707 by having medium K^+/Na^+ ratio, showed better K^+ utilization, and identified as most tolerant genotype to salinity. Such studies are useful in identification of salt tolerant genotypes for salt affected areas, and the farming community can benefited by getting optimum yield from cultivar CIM-707.

Key words: cotton shoot and root tissues, *Gossypium hirsutum* L., growth variables, K^+ and Na^+ accumulation, K^+/Na^+ ratio, NaCl salinity

Received: June, 2014; Revised final: January, 2015; Accepted: February, 2015

* Author to whom all correspondence should be addressed: e-mail: nukmarwat@yahoo.com; Phone: +92-91-9216614; Fax: +92-91-921-6520