

Studies on Drought and Salinity Exposed *Hordeum vulgare* L. under Potassium Deficiency

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Abstract—The effect of salinity stress, drought and potassium deficiency applied alone and also in combinational stress was studied in *Hordeum vulgare* L. to identify the tolerance mechanisms and the adaptability of this crop plant. *Hordeum vulgare* L., were exposed to four levels salinity stress along with control (0mM, 50mM, 100mM and 200mM of NaCl) and drought (withholding the water), alone and in combinational stress. The potassium deficient plants were devoid of the basal dose of potassium (60kg/ha N, 30kg/ha P and 0kg/ha K). All these stresses were studied on the basis of morphological and biochemical parameters. The growth was most affected in the combinational stress of salinity, drought and potassium deficient plants. The relative water content was seen to be more affected in the potassium deficient plants than the other stresses depicting the role of potassium in osmotic adjustment. Among the biochemical parameters the protein levels were increased with the stressed genotypes and the soluble sugar was increased most in the drought stressed plants showing the drought tolerant trait of *H. vulgare*. The proline content was found to be increased in the tolerant genotypes under stress than the sensitive genotypes. The NR (nitrate reductase) activity was reduced in the stressed genotypes with the drought stressed plants showing the least NR activity.