EFFECT OF SALINITY ON THE GERMINATION OF FOURTEEN WHEAT CULTIVARS

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ABSTRACT

To study the effect of salinity on wheat germination, fourteen cultivars were used. Two salinity levels of 140 mol m^{-3} and 220 mol m^{-3} were prepared with NaCl salt. The results showed significant reduction in seed germination with increasing salinity however, the cultivars Pir Sabak 85, Pak 81 and Sarhad 82 were the most tolerant to salinity at germination stage. Contrarily, the Khyber-87, Zarghoon, Paven-76 and Koh-e-Noor were the least salinity tolerant varieties at germination stage.

INTRODUCTION

Salinity is one of the important factors responsible for low yield and restricted economic utilization of land resources both in arid and semi arid regions of the World. In Pakistan approximately 5.67 million hectares of the agricultural land is affected by salinity (Sandhu and Qureshi, 1986), while 0.2 to 0.4% of the arable land is put out of cultivation annually due salinity and waterlogging (Qureshi, 1978). Thus, with continuos land loss and increasing population, there is tremendous pressure to avoid food shortages. Therefore, Pakistani farmers are cultivating salt affected soils along with non-saline soils and applying all the input like seed, fertilizers, irrigation water, labor etc. but with little return. However, very little data is available about salinity effect on germination salt tolerant crop cultivars, particularly wheat cultivars grown in NWFP.

This study was carried out to see the effect of various salt concentrations on germination of wheat cultivars to screen out salinity tolerance cultivars for saline areas of N.W.F.P.

MATERIALS AND METHODS

Germination experiment was conducted in the plastic trays. The plastic trays were washed first and then foam was placed in the bottom of each tray. Two salinity levels of 140 mol m^{-3} and 220 mol m^{-3} were prepared with sodium chloride salt, while distilled water was acting as control, the treatments were replicated three times.

Thirty seeds of each variety were sown in each plastic tray. Trays were covered with plastic sheets to reduce water losses by evaporation. The solutions of each treatment were renewed daily. The emerged plumules of 1 cm length were considered for germination data. Daily number of germinated seeds was counted for 15 days.

RESULTS AND DISCUSSIONS

In generally, the seed germination of the wheat cultivars decreased with increased salt stress (Table 1 & Figure 1). Remarkable decrease in percent germination of wheat cultivars was found at high salt stress that is 45 percent. Significant decrease in percent germination of wheat crop was noted with increased external salt concentrations in growth. The interaction effect of salinity and variety were significant. Varietal mean value showed that percent germination of pirsabak-85 (82.78%) was significantly greater than the other cultivars, while the percent germination of Barani 91, sarhad-82 and Pak-81 was similar. The percent germination of Khyber 87 was highly decreased (61.11%) closely followed by Koh-e-noor and Zarghoon.