The Study of Effect Salinity Stress on Germination and Seedling Growth in Five Different Genotypes of Wheat.

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ABSTRACT

For study germination and seedling growth of five different wheat genotypes in the different level of salt stress, experimental by factorial design include two factors bathed on completely randomized design with three replication was carried out in the seed technology Laboratory of Agriculture Collage of the Mohaghegh Ardebili University in 2010. First factor contains wheat cultivars (Azar2, Sabalan, Alborz, Navyed, and Sardary) and second factor consist of different levels of osmotic solution with 0, 0.5 and 1.5 percent concentration of salt (NaCl). Result showed, Sardary cultivar has lowest root numbers, greatest root length, roots cumulative length and coleoptil length. Interaction of (variety× salinity) for the root length and roots cumulative length were significant. Also, Sardary, Sabalan and Azar2 cultivars showed the greatest, leaf length and stem wet weight but Navyed and Alborz cultivars for two above characters were low. Sabalan and Sardary cultivars for stem dry weight were higher than others wheat varieties. Also Sabalan and Azar2 for roots dry weight have greatest but Alborz variety has lowest value. Result showed that with increase salty, root length, root cumulative length, leaf length, wet and dry weight of stem and root decreased in the all of wheat cultivars. Only root numbers was increased by increase salinity (in the Alborz variety).

Key words: germination, salinity, seedling and wheat.

Introduction

Salinity of the factors limiting growth and production of agricultural products is considered. A significant part of the world's land was passion that optimal growth of plants and reach their maximum yields potential will be banned. Salt will quickly Rakm Rshdgayh [12,16]. Plants respond to salt stress is very complex [15]. The most important plant response to soil salinity, growth is reduced. If the salt around the seed germination is now more than 4 mg cm on the mouse may be the initial plant germination and growth stopped Takhyrafad or [2]. Increasing amount of NaCl, germination rate Nyzkahsh finds precedent [9]. Most sensitive stages of germination and poor germination in soil salinity and low Astqar cause poor seedling production, and finally will lead to reduced product [8]. Effect of salinity on root and shoot growth in many crops has shown that salt stress at germination stage of a reliable test in evaluating the tolerance of many species, because salinity reduced root and shoot growth are [11]. In an experiment on wheat, alfalfa, soybean, corn, sweet clover and rye in three years, it was observed that increasing the EC of irrigation water (salt water), shoot height and root length was significantly decreased [10]. On crop, yield reduction and plant growth under saline conditions than non-
saline conditions as a criterion for assessing the salt tolerance is used [15]. Considering the extensive cultivation of wheat and salt levels in the world wide agricultural lands among all the most resistant varieties of wheat varieties can increase yield and will increase production per unit area. In the study of rural and colleagues [3] noted that the figures along with Sardari and Sabalan Klvryptyl, root length, shoot length and shoot weight more in their adaptation to dry conditions, cold and temperate regions is effective. Sadegh Zadeh et al study [4] during Cloptil between different wheat types has shown a significant difference. Wheat seed containing more Cloptil ancestry during the wheat seed containing Cloptil shorter faster bud [5]. The emergence rate of wheat seedlings with Cloptil long, most are selected so that the wheat cultivars of different reaction temperatures on seedling emergence and speed during Cloptil done [7]. Amiri and village [1] based on 24 experimental cultivars, found that during Cloptil Sardari cultivar had the highest and most root length among all the cultivars under study is.

Materials and Methods

Experiment in 2010 in the Faculty of Agriculture University researcher Ardabili two factor factorial with three replications and 25 seeds in each replication were performed. The first factor figures (Azar 2, Sabalan, Alborz, Navid and Sardari), the second factor salinity levels (0, 0.5 and 1.5 percent salt solution) were. Germination test and seedling growth in Petri dishes 9 cm filter paper under Bayk and one was in the seed. In order to disinfect seeds of two fungicides Benomyl was used in thousands. For applying different levels of salinity, different concentrations of 5 ml were poured in each Petri dish. The Petri dish inside the chamber at a temperature germination model Axyos 20 °C and relative humidity of 65 percent was placed. After nine days and counting germinated seeds of different traits were measured. Number of roots, leaves the most elongation, Cloptil length, leaf length, cumulative length of roots, stem fresh weight, shoot dry weight, root fresh weight and root dry weight for normal seedlings were measured. To dry root and shoot her with a significant air temperature 70 ° C for 48 hours were used. Samples were weighed with a precision digital scale was a thousandth. For data analysis of SAS software was used. Also compare with the Duncan test was performed one percent level.

Results and Discussion

Total root length and root elongation most cumulative root:

Comparison showed that among the studied cultivars, varieties and promising Alborz had the maximum number of root level Sabalan obtained. While the Persian date Azar 2cultivars Sardari and had the lowest number of roots. Between different levels of salinity for root traits number of statistically significant differences existed so that the salinity level of 1.5 percent was the first group and the control levels and 0.5 percent were in the next level. Cultivar interaction for number of roots of salt * statistically significant differences were observed so that the figure in the Alborz salinity 1.5 percent was the highest number of roots in Persian date. Azar 2 figure control was the lowest number of roots. Root elongation for most varieties was significantly different and thus the Sardari cultivar had the highest root length. Cultivars Persian date 2 Azar and Sabalan in the second and figures promising and Alborz, respectively at the lower levels were in the study of rural and colleagues [3] also noted that the cultivars Sardari and Sabalan having root length more for areas dryland areas of cold and temperate is appropriate. The results showed that root length with increasing salinity significantly decreased. Concluded that the results are as poultry and Asif [10]. Salinity * cultivar interaction for root elongation most highly significant so that maximum and minimum root length, respectively Sardari cultivar in control and promising figure in the salinity level was 1.5 percent. Cultivars differ in terms of cumulative length of roots was statistically significant figure and figures in the first group Sardari Sabalan, December 2, Navid and Alborz groups respectively were next. Also were observed with increasing salinity along the root aggregation decreased quite significantly. The interaction of salinity * cultivar was significant for this trait and thus control the Sardari cultivar had the highest level and promising figure in 1.5 percent salt cumulative root length was lowest.

Cloptil length and leaf length:

Number of significant length Cloptil had together. Maximum length about Cloptil Sardari cultivar and lowest in the Alborz and promising varieties and cultivars Persian date 2 Azar and Sabalan respectively after figures were Sabalan. These findings with findings in rural and colleagues [3] matches. Comparison showed that the length between the different levels of salinity Cloptil statistically significant difference exists. Cloptil highest level over 0.5 percent and the lowest levels in control and 1.5 percent were observed. The salinity * cultivar interaction was not significant for Cloptil. Comparison between the figures showed that of the leaf length is significantly different. Sardari figures, and the Persian date 2 Azar jointly Sabalan highest leaf length and figures were promising and were later in the Alborz. For leaf length traits between different levels of salinity differences existed. Thus the leaf length in control and 0.5 percent in the highest value and 1.5 percent had the
lowest salinity. Salinity * cultivar interaction for this trait also did not differ statistically.

**Fresh weight and shoot dry weight:**

Among varieties of fresh weight and shoot dry weight differences were significant. Cultivars Sardari, Sabalan, Persian date 2 Azar with shoot fresh weight were more promising Alborz and were jointly the next level. Comparison showed that increasing salinity reduced shoot fresh weight is such that more weight had the lowest level was 1.5 percent. The results reported Jkf Vlrnr Paul [12], Zidane and Malybary [16], Zmy and suffering [6] matches. Salinity * cultivar interaction for this characteristic did not differ statistically. Figures Sabalan and Sardari highest shoot dry weight and Figures Persian date 2 Azar, Navid and Alborz respectively had the lowest shoot dry weight. Between salinity levels and salinity * cultivar interaction for this characteristic was not statistically significant.

**Fresh weight and root dry weight:**

Differences between cultivars for fresh weight and dry weight of roots were statistically significant. Sardari was also the highest figure and figures Alborz and promising root fresh weight were the lowest. Results showed that increasing salinity reduced root fresh weight, so that the highest fresh weight of root control level, respectively. Sabalan figures also were observed and the highest figure of Persian date 2 Azar Alborz root dry weight were lowest. Root dry weight decreased with increasing salinity and least root dry weight to surface salinity was 1.5 percent. Dry weight loss due to salinity has been reported in most studies. [13,14], so many studies of this trait as the main indicators of salinity tolerance are mentioned [13]. Salinity * cultivar interactions for both traits were not significant statistically.

**References**

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