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The Surveying of Eco Physiologic and the Effective Factors on the Seeds Germination of Weeds *Malva Neglecta, Echinochloa Crus-Galli* and *Sorghum Halepense*

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ABSTRACT

Malva, *Echinochloa*, *Sorghum* and *Malva* are the persistence and problematic weeds on wheat sugarcane, rice, corn and gardens in north of Khuzestan. In order to determine the effect of salinity stress in exhaustion and non-exhaustion on the ability of seed germination and seedling of these weeds the testing has been implemented on laboratory as a factorial and in the accidental project in 4 replications in 2013.The first factor of the weed, the second factor of exhaustion treatment: (non- exhaustion) and the terms of exhaustion (3, 5 and 7 days) and the third salinity treatment (4, 8 and 12 days decimeter per second and salinity certification 0.7)were. The obtained results of the variance decomposition of the test datum showed that among of studied subject treatments, there is more different significant between probable level of 1 percent according to all assessed characteristics.The exhaustion and stress of salinity caused to decrease all surveying characteristics on weeds has been mentioned. Echinochloa has the most maximum exhaustion and stress on germination speed and indexes of uniformity and Sorghum weeds has the minimum of the exhaustion and stress amount of them on characteristic. The 7 days of exhaustion and salinity 12 decimeter per second have shown the most minimum of rate on characteristics.

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INTRODUCTION

A recent advance in managing of weeds is often due to their physiological and ecological characteristics. Excessive consumption herbicides in recent years, many researchers and farmers thinking about the alternative methods to help them to deal with the problems caused to minimize effects abuse weeds.Many researchers believe that the eco-physiological characteristics of weeds and their biological relationship with the environment and how it relates to weed control are steady of control weeds is only way.One of this methods is Testing and investigation such as population density, controls weed seeds in the soil seed bank for the reservoir model and capture the nature of the climate and the forces of nature [25]. In ecological methods of weed control, with emphasis on environmental protection and ecological health of the agricultural and reduce the fees toxins and herbicides resistant to weeds can be created and prevented. For the more their knowledge of weed management and population density of seeds starts in soil seed bank and this way of the conditioning, soil, water and oxygen relations, soil salinity conditions, the seeds of a dry or wet the major elements are considered in management of ecological [6]. Significant differences are between the old seeds and old artificially seeds in reduced the germination percentage and slower germination rate in old seeds [24]. Although much research has been implemented on the degradation effect on seed germination but their effect on the germination of seed deterioration under environmental stresses, few studies have been done. It can be concluded that the deterioration of seed, seed vigor, and seed quality is the first component decreases and subsequent germination capacity and viability will be reduced. Figorid, D et.al [10] reported that the strength of the effect of seed germination and seedling greening depends on the action of environmental stress during germination and seedling greening, as well as the effects of stress varies in different species. Salinity with increasing drought intensity stress of seedling length, also stem-growing and the dry weight of growing-plant in comparison with evidence will be significantly increased.

Relationship between water potential and germination rate is a line and germination rate is boosted by increasing water potential [7].

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Understanding the ecology of germination and seedling of weed Malva neglecta, Echinochloa crus-galli and Sorghum halepense have important role in their long-term management and control.Therefore, this study aimed to determine the effects of salinity on germination and seedling emergence Malva neglecta, Echinochloa crus-galli and Sorghum halepense has been done.Until studies on the effects of environmental stresses on seed germination crumbling Malva neglecta, Echinochloa crus-galli and Sorghum halepense has been done.Therefore, it seems it should be necessary to operate. The study on the effect of seed deterioration can sprout seeds Malva neglecta, Echinochloa crus-galli and Sorghum halepense under control and salinity conditions were studied.

MATERIALS AND METHODS

Seeds of Malva neglecta, barnyard grass (Echinochloa crus-galli) and Johnsongrass (Sorghum halepense) have been provided on natural gene bank of the Research Institute of Forests and Rangelands, Karaj Seed and Plant Centre. The research in crop year 2013 in the laboratory has been implemented as a factorial randomized complete block design with four replications. Procedure for the accelerated aging test exhibited 100 g of seeds from each of the tested weeds first in order to sterilizing in solution of %10sodium hypo chloride solution on 2 per thousand carboxin thiram about three minutes has been located and then samples were washed with distilled water. Samples have been located for the drying at a temperature of 32 ° C for 24 h germinator. After wards in order to adjust the relative humidity (100%) of the weeds seed tested on an aluminum wire mesh inside sealed plastic containers and has been located on separate vacuum vessels was spilled on the floor of distilled water.for seeds were 0, 3, 5 and 7 days in a closed plastic containers with 100% relative humidity at 40 ° C were located in germinator. At the end of the seeds has been simultaneously got out of germinator. The treated seed based on an international standard test method for testing germination of seeds were located in the oven.

*Experimental treatments***:**

Weeds, including three weeds, Malva neglecta, Echinochloa crus-galli and Sorghum halepense

Aging treatments: Duration of exercise exhaustion include fatigue duration (3.5 and 7 days) and specimen testifier (without depreciation). Salinity treatments included four levels of salinity (7/0, 4,8,12 dS m)

Requirements Petri dishes to test were sterile in the oven at 180 ° C for half an hour.The numbers of 50 seeds in four replications for each of the tested weeds were placed on two sheets of filter paper and 10 ml of distilled water was added to each 9 cm Petri dishes.Germinator temperature was considered at 20 ° C for weed Malva and 25 ° C for Echinochloa crus-galli and Sorghum halepense. Seed germination assessments were conducted regularly during each 24 hours.The seeds that their radical root was grown 2 mm, the seeds was considered as germinated seeds. The evaluation of germination was attended in seventh day and the time is corresponded the number of Germinated seed for 2 consecutive counts was Completed and this time was considered as the end of Seed germination. After completion of the characteristic were measured as following below; after end of germination, seedling growth test by measuring radicle length, shoot and seedling dry weight of 10 seedlings randomly was implemented of each replicate at the end of the seventh day.

Percentages germination: percentage germination by counting the number of normal seedlings in standard germination in end of period was calculated by dividing the total number of seeds [17].

Germination time average: germination time average was estimated by using equation (1).

$$MGT = \sum n_i d_i / \sum n_i$$

Equation *(1)*

Germination time average [12].

n_i: The number of germinated seeds per day

d_i : According to time of day

The equation (2)

$$CUE = \sum n / \sum [(t - \bar{t})^2 \times n]$$

The uniformity of seed germination [13].

n: the number of germinated seeds per day

t : the time in days from seed planting

$\bar{t}$: Germination time average

Length of coleoptile and root length

At the end of the seventh day of seedling growth test, 10 seedlings were randomly selected from each container and root length and coleoptile (shoot) was measured.

Dry weight of seedling:

Seedlings dry was located on the oven with a temperature of 70 ° C for 48 h and then dry weight of seedling was measured. Vigor indicators were calculated by using the following relations.

Equation (8) First vigor index = (length Coleoptile + Average length of root) × percentage Seed germination

Equation (9) the vigor index= seedling dry weight × percentage Seed germination

Analysis and decomposition of datum were performed by using MSTAT-C software. In order to compare average, Duncan's multiple range tests was used in probable level about 95%.

Discussion and conclusion:

The results of the test characteristic variance decomposition shows that the effect of salinity also based on the implemented salt concentration caused to decrease germination. So that treatment 0.7 DS per meter and salinity 12 DS per meter appear the most maximum and the most minimum of germination respectively. The sort of weed also has been significant on the characteristic of germination percent in the probable level is 1 percent. About this characteristic, Echinochloa has the most maximum of value as a characteristic and Sorghum was observed the most minimum of germination. The seed of Echinochloa weeds of exhaustion evidence under the solidity evidence treatment and 4 DS per meter and the 3- 5 days of seeds under solidity evidence have the maximum of germination percent. The reaction compared to different exhaustion level show that the highest value of germination percent related to the exhaustion evidence Echinochloa weeds (84.75) and the least of germination percent is on Sorghum under 7 days treatment of exhaustion (2.000), comparison of treatments exhaustion interaction moderate on salinity, shows that the term of exhaustion has been decreased by boosting of duration of exhaustion and the salinity stress concentrations of germination present. So that salinity evidence treatment and exhaustion evidence (73.00) and the seven days exhaustion seed treatment and salinity with concentration 12 DS per meter (13.33 and 12.00) have shown the highest and the least of germination percent respectively. The different studies have been implemented about the effect of seed exhaustion on the germination of different plants.

Isa Vand and Ali Zadeh have operated on their test in order to assessing the quality characteristic of Moldavian balm herbal plant. They reported that it is not observed different significant between 0, 12, 14 hours of exhaustion treatment but the exhaustion treatment on 48 and 72 hours has shown the significant decreasing as germination percent. Similar results such as decreasing germination percent according to seed exhaustion on grass [1], rapeseed [15], wheat [22] and Nut have reported that the germination is decreased by increasing the durations of exhaustion.

CHAUHAN [9], main changes in the cell have been introduce to reduce germination due to the exhaustion (membrane, mitochondria, protein synthesis, ribosomal DNA) and enzyme system led to decrease vital ability and seeds dream ability. The results showed that treatment 0.7 DS per meter and salinity 12 DS per peter is involved the highest of time germination average. The weed type on mentioned characteristic in probable level 1 percent has been significant. About this characteristic, Sorghum and Malva have been indicated the highest value and the lowest time average of germination. The interaction seed-kind and exhaustion shows that the seeds Sorghum exhausted in 5 and 7 days has the highest germination time average (6.615 and 6.552) and Malva certificated exhaustion has the lowest amount of this characteristic (3.152). In surveying of exhaustion effect and salinity stress, salinity evidence were observed the highest mentioned characteristic exhausted in seven days under treatments 8 and 12 DS per meter (6.259 and 6.133) the lowest its value (3.458) in the seeds certificated exhaustion.

Soltani and et.al [22] have reported that in evidence seed wheat will be started and ended its germination in short duration of time. Larson et.al also have presented the germination time average as a main index of brave correlation by percent and appearance value of seedling in the farm of Brassica Napus exhausted germination. Demmir Kaya and et.al [11] have expressed that the NACL prevents penetrating water onto seeds by making osmotic pressure and with envenoming seeds by the ions Na^+ and Cl^- caused to decrease and postponing of the germination.

The results of datum shows that the highest of germination rate has been belonged to Malva under the erosion control treatments and salinity evidence with average of 0/441 and the lowest of mentioned characteristic value to the seven days of erosion seeds Echinochloa under treatments 8 and 12 DS/m and 5 and 7 days of Sorghum erosion seeds under the treatment 4, 8 and 12 DS/m with average of 0/000.

In according to comparison with average of the weed-kind interaction and erosion of evidence Malva have the highest germination (0/332) and Sorghum under the treatments of 5 and 7 days exhaustion has the lowest germination (0/048 and 0/046).

In the surveying of reaction of the researchable weed according to salinity, decreasing germination rate is observed due to increasing of salinity value every one of weeds. Of course, there is also no different significant between Sorghum 8 DS/m and Sorghum 12 DS/m.

The comparison of the treatments interaction average of erosion and salinity showed that the erosion control seeds and salinity evidence had the highest of germination rate (0/311) and seed exhausted 7 days old under 8 and 12 DS/m had the lowest germination rate value (0/070 and 0/076).

In surveying of seed erosion effect on implementation and performance component of two style of chick pea, Roz Rokh and et.al have shown that germination rate in comparison with other characteristics indicated more intensity for erosion and it has been appeared different exhaustion between masses.

Soltani and et.al [23] have shown according to obtained results, germination rate was significantly decreased by the period of erosion.

Betti and et.al duration of co-relation observation on decreasing of germination rate by reducing of oxygen consumption on seed on seeds of led to the erosion, the deterioration of structure of respiratory enzymes included Glucose Di-Hydrogenous, Pyrophosphate fructose -6and Phosphate- Transferase -1 have introduced as a factor of increasing rate and speed of germination and the seedling basis of erosion seeds.

The reason of decreasing speed and percent of germination can be consumedly related to presence of cations and anions on cultivation environment as their reaction capacity is located on environment in the existence ions occupancy and therefore the plant is not able to absorb water and faced to lack of water [16].

The results showed, for a trait of root length, seed treatments and salinity stress caused to decrease this characteristic significantly at the probable level 1% of.

According to shows the effects of salinity significantly reduced wear and exhibited this characteristic. The effect of weed species also shows that the maximum and minimum of root length owned to Echinochloa crus-galli and Sorghum halepense respectively. Comparison of average shows that the four control Echinochloa seed and erosion control has the highest salinity (6.41) and Echinochloa seeds, 7, 8 and 12 DS/m salinity and ***Malva neglecta*** seeds, 5 and 7 days old under salinity 4 and 8 and 12 DS/m had the lowest average yield. Comparisons of average reciprocal effects of weeds, erosion seed showed Echinochloa under control treatment has the highest level of root length (4.301) and seeds 7 days old Sorghum has the lowest yield (0.050) of this characteristic value. Meanwhile seed treatment 7 days old Echinochloa also with old Sorghum 7 days did not show significant differences. Surveying of weeds reaction compared to Sorghum under saline-treated controls is the highest salinity (4.066) and Sorghum under untreated is the lowest salinity of 12 DS/m root length (0.287).

According to the average comparison, erosion control plots, salinity control has the highest average of root length (4.837) and under the concentration-aging treatments 7 days 8 and 12 dS m, salt has the lowest (0.067) root length Average.

Stress (erosion or dryness), not only the air system but also affected on the plant's root system, which can also affect the root dry matter production.Therefore the amount of dry matter production of roots in non-stress conditions more than normal and stress conditions. However, the production rate at the root of stress and erosion in a dry state is much more pronounced [3].Bsra et.al in cotton and in sunflower reported that erosion in sunflower seeds was significantly reduced seedling growth. Foujikora and et.al [14] changing of protein seeds for seedling roots of cabbage (Brassica oleracea L.) with 10 percent humidity at 42 ° C in 3 day aging were observed.Some studies indicate that germination of Atriplex triangularis in salinity environments are shorter step-growing and road length NaCl salinity compared to other materials causing a greater inhibitory effect on the appearance of fetal tissues [18].

Weeds reaction also shows some ***Echinochloa crus-galli*** and Malva indicates the highest and lowest of shoot length average respectively.

In this experiment ***Sorghum halepens***e under control treatment (corrosion and salt) has the highest (355/10) and 5 day wear Malva and ***Echinochloa*** under similar treatments under salinity of 12 dS m-aging treatments, 7 days 0, 4, 8 and 12 dS m and ***Sorghum*** under 5 days erosion and salinity treated, 4, 8 and 12 DS/m as well as the seed ***Sorghum*** in 7 days salinity treated 0, 4, 8 and 12 dS m had the lowest shoot length. According to the comparisons of average of interactions between weeds and erosion, the control ***Sorghum*** showed the highest (8.122) and three weed seeds 7 days old study is the lowest shoot length. Deliberation response of weeds in comparison to saline-treated control group Johnsongrass seeds was observed that most (4.808) and treated seeds Malva 12 dS m (0.115) had the lowest shoot length.The results of the comparison between the effects of erosion and salinity control treatment (control erosion and salinity) has been the highest rate of shoot length and worn in all salinity treatments Seeds 7 days old and treated seeds of 5 in Average 12 dS meters lowest length of root.

Mortazavi *et al* [20], in his experiments on peas reported that increased levels of burnout and decrease the length of the stem and buds also increased the percentage of non-normality in all the genotypes. Seedling length decreased due to accelerated aging treatments can result in loss of cell membrane integrity, resulting in the withdrawal of seedlings grown from seed and soluble intracellular adhesion is injured.

Marlys *et al* [21] reported the inhibitory effects of salinity by reducing the average length of seedlings seeds collected in the field with low salinity, medium and high categories. They also can be the seeds of E. crus-galli in sodium chloride solution 5/1% buds get, but the seedlings for 20 days in the top 1% sodium chloride salt was able to maintain their life. They concluded seedling growth stage is more sensitive to salinity at germination. Related results to the first and second characters vigor indicators showed that weed barnyard characters indicate the highest and lowest Johnsongrass.

seeds of ***Echinochloa*** under the erosion control treatment is the highest and treatments of ***Malva*** and ***Echinochloa*** seven day old erosion and ***Sorghum*** 5 and 7 days old erosion are the lowest average of these brave characteristics.

Surveying of studied weeds reaction compared to salinity, its interaction showed Sorghum under saline-treated controls is the highest and Sorghum under untreated is the lowest of this characteristic average 12 DS/m root length (0.287).

The decline in seed vigor traits and seed-aging effects of time exercise salinity is downward, so that the treatment for exhaustion 3 and 5 day treatment for 7 days, salinity and erosion 12 dS m the treatments were of 0, 4, 8 and 12 dS m caused the greatest reduction in seed yield is strength.

The control treatment (erosion and salinity) is allocated to the highest average yield. Mansour et.al reported that salinity is decreased the enzyme amylase Alfa. This enzyme caused to break down the starch in the cotyledons and any decrease in the activity of this enzyme is naturally fast break that stores and indexes germination of seeds is reduced. In according to obtained results of this study is determined that the treatments of applied seed erosion duration has been effectively affected the ability of germination, seed basis and seedling and the surveyed features on three weeds relatively is important as a remaining of weed seed in soil seed bank for this conclusion. By surveying results were compared with the attributes of both weeds was found that Malva in characteristic related to germination has been more successful than other weeds.With proper management techniques can be applied to many of germination and establishment of weeds in agricultural fields to prevent the dramatic impact in reducing the cost of fighting chemically and biologically against of these weeds. Islamic Azad University, Shoushtar Branch, Shoushtar, Iran, will be appreciated.

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