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Examine the morphological and physiological characteristic of those genotypes hoped to be resistant to drought in chickpea (Cicer arietinum L.) in complementary irrigation.

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Abstract. An Investigation was done in educational- research farm of Agriculture college of Shahid Rajaei in Neyshabour from 2010 to 2011 to examine the morphological and physiological characteristic of seven genotypes resistant to drought in chickpea (Cicer arietinum L.) whit complementary irrigation (irrigated in planting and flowering period). The test was performed in randomized complete block design with four replications. Results showed that there was considerable diversity among examined genotypes from the phonological (days lasting from planting to flowering and from planting to pod construction), morphological (plant height, plant dry weight, 100 seed weight, seeds yield per square meter). Comparing the response of genotypes revealed that the MCC80 genotype has the highest rate of seed production, and hence suggested it is most desirable genotype for complementary irrigation in this site.

Keywords: Complementary irrigation, growth index, morphologic characteristics, chickpea.

1. INTRODUCTION

Peas, every 700 Thousands acre under cultivation has got 64 percent of cultivated grains in Iran[1]. This plant has the most level of cultivation and production in Iran[6]. From 11 million acre of cultivation of this grain and production of 6 million ton of it in the world, 625 thousands acre and 223 thousand tons are belonged to Iran respectively among the grains[6]. Pea has the least need to water which can compromise with lack of water[3]. Sing and his colleague's[5] mentioned that in years that raining has been very low in proportion to other years, due to the drought the production of it reduced. This two men find positive and correlation between season raining and both winter and spring cultivation. They reported that the average product of % 75 much than spring cultivation. They cited that the increase of time of growing of pea in winter as the main factor of increasing of biomass and higher function in relation to spring cultivation.

Due to lack of raining spring in Neyshabour and confronting of plants whit drought and heat this study performed to access the genotypes tolerated to drought and performing precise studies an also investigation the compromising of above genotypes in producing areas with two irrigation times, the first irrigation at the cultivation step and the second one as a complementary irrigation at flowering time. In order to introduce the types who could tolerate lack of water and have more production in complementary situation.

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2. MATERİAL AND METHODS

This planning was performed in educational- research collage of Shahid Rejaei in Neyshabour in farming year of 1389- 90 the studied soil had %32 silt, %44 sand, %24 clay soil, and % /195 carbon, 5 PPM absorbent phosphors, 100 PPM absorbable potassium, %18 neutrals materials (T.NN) with PH: 7/5 and EC: 2/8 ds/m. that is suitable cultivation of pea. the test was performed in randomized completely block design whit four replications.

The needed seeds was prepared from Mashhad Ferdowsi University.

Seven pea genotypes were investigated with 30 bushes in each square line and with fixed 50 centimeter between the cultivated rows along with complementary irrigation in the time of flowering.

The phenology steps including the day of growing, flowering, pod construction, bush height in investigating time philologically and the average height of main stem from the earth level, weight of 100 seeds, the whole produced seed in each time in gram sand the average of five dry plant when they completely grew, was defined.

3. RESULTS

The duration of plant from time of cultivating to flowering and from cultivating to pod construction:

The results of variance analysis showed that genotype factor has meaningful influence during the cultivation to flowering and to pod construction of the peas.

The results of study in average way confirmed that MCC80, MCC696, MCC392, MCC537 genotypes the least time from cultivation lasted flowering and pod construction, and MCC252, MCC358 genotypes lasted the longest time from cultivation to flowering and pod construction.

The bush height and its dry weight:

The results got from variance studies showed that genotype factor has meaningful influence on the height of peas bushes.

The results of study in average way confirmed and showed that MCC80 had the least bush height while MCC537 and MCC392 had the longest bush height.

Weight of 100 seeds:

The results of variance analysis showed that genotype factor has meaningful influence on the number of pod in each pea seed.

The results of comparing shows that MCC252 has the most weight of the seed in 100 seeds.
The function of seed:

The results showed that genotype has active affect on peas seed function. The comparing of average studies confirms that the MCC252 and MCC358 types have the least seed function and

MCC80 has the most seed function in each acre. The genotypes MCC252 and MCC358 have important difference with MCC80 but their difference with other genotypes was meaning full.

Table 1. Analyze, Variance of Pea genotypes in complementary irrigation

Source changes	Freedom grade	Days lasting from planting to flowering	Days lasting from planting to pod construction	Plant dry weight (g)
Repeat	3	13.560	2.131	261.532
Treat	6	137.333 **	659.226 **	404.350 **
Experimental mistake	18	18.32	1.797	95.981

Table 2. Continuing of Analyze, Variance Table of Pea genotypes in complementary irrigation.

Source changes	Freedom grade	plant height (cm)	100 seed weight (gr)	seeds yield (Kg /acre)
Repeat	3	0.603	1.265	16630.014
Treat	6	38.296**	66.146**	68288.49*
Experimental mistake	18	6.347	3.255	14649.410

4. DİSCUSSİON AND RESULTİNG

Research results indicates that by complementary irrigation in time of flowering, the seed function becomes better in comparison with the dry farm (without complementary irrigation). By complementary irrigation the farming increase of seed function in MCC80 genotype has been about 970 Kg in each acre. And it is two flood more than function in dry farming condition. And about %75 in comparison with irrigation conditions.

While the seed production in MCC358 genotype is about 320 Kg in each acre. And of MCC252 about 320 Kg in each acre and it has been less than the average seed function in peas in dry farming condition.

Thus it is possible for that group of farmers who have cultivated the MCC80 genotype and com per from the irrigation during flowering time, could increase their production (about two-fold more than dry farming condition or about %75 in relation to irrigation type) in this way performing complementary irrigation would be economical.

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