

The study of the influences of cultivation date and species on some of the morphological qualities of corn growth in darrehshar climatic

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ABSTRACT: To consider the influences of planting date a cultivation on some of the corn morphological features, a research was conducted in Darrehshar city in 1390(2011-20122). The experiment was done in the form of split plot in a complete random design framework with four time repetition. In the current study, the corn planting date four levels including 10/4/1390, 20/4/1390 and 10/5/90 as the main split and species factor with three levels including 540 SC, 647 SC and 704 SC were considered as the secondary split. The results obtained from variance analysis tables related to the characteristics under study revealed that the bush and corn height, length, corn thickness and its weight were %5 meaningful, while; features such as bush wet weight, bush dried weight, and the leaf level determination were probably %1 meaningful. But the corn thickness feature wasn't meaningful. As well, the current study showed that the effect of cultivation (species) on most of the characteristics in the study was not meaningful. However, it should be said that each of the factors or delay in cultivation will cause downfall of the features under study. Therefore, the second cultivation date, i.e., 20/06/2011 was considered as the best cultivation date for each of the species in the study.

Key words: Cultivation date, species, 540 SC, 647 SC, 704 SC

INTRODUCTION

One of the plants in our country, Iran, which is considered as a main diet and adjustable ecological vast conditions and has a good productivity, is corn. The world under- cultivation level of corn is almost 2/139 hectare and the total production has been reported as 4600 tons. The main producer of the corn in the world was the United States of America with the cultivation of 5/28 million hectares of the lands could produce 7/239million tons of corn grain. The corn under cultivation level in Iran is 156 thousands of hectares and the total production is 941 thousand tons of corn grain. Corn is the third productive cereal in the world after wheat and rice. In the firsthand corn is for producing seed and in the second hand it is cultivated for the production of feedstuff and industrial raw materials (Bahrammojadadi, 2009). In the cultivation of products such as corn, the first step of the research can be considered as the hybrid selection for each area and after that the research on agricultural factors like cultivation date are of importance. However, the aim of determining the best cultivation date of corn, is finding the time after cultivation in which the plant can get the most benefits from ecological and environmental factors as well as can abscond from the environmental disadvantageous factors (Banhehsaz, 1998). The results of the studies done by Darby and Layer (2002), Layer, et al (1999) and Norwood (2001) demonstrated that the later cultivation of corn cause the decrease in the production amount as well as corn foodstuff quality. The experiments done by the Wioteract et al (2004) showed that the delay in cultivation will follow a series of diseases on corn biological function. In one study it was known that the aggregation of the dried matter in 704 SC species has been more than what was in 604 SC. And there was a meaningful difference betweenmatters (Peters & et. al, 1971). Hunter (1980) demonstrates that delay in cultivation causes the plant reaches to the highest level of leaf with a fast speed and starts a descending flow in the shortest time and this shows that agricultural factors affect the corn growth changes trends (Hunter.1980). In a biyearly study it was known that the effect of cultivation date particularly in the second

year has been meaningful on bush height, corn height, and corn wood percent, but has not been meaningful on corn thickness. As well, it was proved that the more the cultivation is delayed the higher the bush becomes (Normohamadi.2001).

The aim of the present research is determining the effect of cultivation date and species on some of the morphological features of corn which clarifies that cultivation date factor by affecting on these features has caused shifts and changes in corn function.

METHODOLOGY

In order to investigate cultivation date effect and species of 540, 467 and 704 on corn morphological qualities, an experiment was done in one of Aramo village piece of land, located in the mild and warm climatic condition in Darrehshahr city in 1390. Darrehshahr city is located in city center 135 Km roads in the east- Southern part of Ilam province. It is located in 160 Km of Lorestan province west southern part. Aramo village located in 47 and 48 degrees of geographical longitudinal and in the circuit 33 degrees and 10 minutes of northern breadth from equator and the height of almost 636 meters from sea level. Meanwhile, the average rainfall in the area under study is 510 millimeter. To prepare the land for cultivation, the intended piece of land was irrigated and furrowed with plough about 12 centimeters. And then two discs were used vertically for leveling of the land and phosphate nitrogen chemical fertilizer distribution. The leveling was done for the second time for better efficiency. It should be mentioned that the whole phosphoresced fertilizer and half of the nitrogenous fertilizer were used according to the experiment trend. The other half of the nitrogen fertilizer was used in the corn eight leaves step. Then by using favorer set the intended land was prepared for cultivation in the form of atmospheric and barrow. The barrows distance in each split was 75 centimeter. This experiment was conducted in split plot in four repeated times complete random framework. The experimented groups from cultivation date onward in four levels included 01/07/2011, 11/07/2011, 22/07/2011 and 01/08/2011 as the main split and the species factor including 540 SC, 647 Sc and 704 SC as the secondary split. The size of each split was 36 square meters and each secondary split included six cultivation rows having eight meters length which between each six rows was a free space uncultivated line. After making split in barrows climax by workers, the 20 centimeters apace for bushes distance were considered. Then, by putting the seeds inside the splits, the seed were covered by soil and the soil on the seeds was compressed so that the seed could touch the ground and germinate better. The depth of the cultivation was considered as 5 to 7 centimeters and the irrigation period was from 3 to 5 days. Since the density and accumulation of the bush while cultivation was considered high, the spar sing of the grown corn was started after complete germination and monoleaving of the corn embryo and the spaces were regulated and organized. The weeding of the brushes was done by the farm workers with dibber.

In order to analyze the gathered date to compare the growth morphophysiological qualities, first; each 5/4 * 8 square meter split was divided into two parts so that only one part was dedicated to the intended qualities. The sampling was destructive and each 10 days one time. The sample taking was 5/0 square meter level and based on Weight (1962) mentioned standards. The split sampling was just done in the first and sixth rows and the acronym (terminable) bushes in each raw as the border effects were removed. The first sampling was done 30 days after cultivation and continued till corn physiological maturation. The investigated qualities in each sampling included: bush height, corn height, length and thickness, corn wood thickness, corn weight, bush dried weight, corn weight and leaf quality level. The measurement of intended morphophysiological qualities was done based on Gardner et al (1985) and Radford (1967) suggestions. The MSTATC, SPSS and SAS software was used for comparing the test average and Danken multidomains.

RESULTS AND DISCUSSION

The summary of the analysis of the measured qualities variance in Table 1 shows that the effect of cultivation date on qualities such as corn height and length, corn thickness, bush wet weight, the leaf level quality and dried weight has been meaningful in %5 level.

The corn height from the ground level

The effect of cultivation date on corn height shows that cultivation date delaying decreases the corn height from the ground. According to Table 1, it was shown that the height corn various qualities in various cultivations has been statistically meaningful in 0/5 level. But the influence of species on this quality we well as the mutual species and cultivation date didn't show a meaningful difference. The maximum corn height from ground level was 16/83 centimeters in 11/07/2011 and the minimum corn height was in 01/08/2011 cultivation dates respectively

(Table 2). Table 3 shows that among the studied numbers, 704 with 44/74 centimeters has been the most corn height from the ground level and 647 with 5/69 centimeters has been the least corn height. Researchers like Saberi (2005) and Siva kumar (1978) point out such results as well.

Corn height

The results of the analysis of the variance of this quality in Table 1 show that the difference between various cultivation dates according to this quality has been meaningful in 0/5 level, but there was not a meaningful difference between the cultivation date and species mutual effects. The influence of cultivation date on bush height show that delay in cultivation date culminates in severe decrease in bush height, so that the minimum bush height was related to the fourth cultivation date (01/08/2011). Among the investigated numbers, 540 with a height average of 167 centimeters had the most maximum and 647 with an average of 155 centimeters had the lowest height bush. Table 3 shows that 540 species has been more adaptable to the environmental conditions in vegetation aspect. Nurmehamadi (2001) knows the cultivation date effect on corn bush height as the effective factor and states that cultivation date deferment will culminate in bush height increase but Saberi (2005) reports similar results to our own results.

Corn length

Table 1 shows that the differences between cultivation dates on corn height have been statistically meaningful in 0/5 level, but the species effect as well as the cultivation date mutual effects were not meaningful. The highest maximum of corn height was 15/19 centimeters related to the species 704, although the difference between the three species was not statistically meaningful (table 3). Hence, it seems that the more the vegetation period is, the more the height of the corn will be. This is due to the efficient use of the environmental conditions and enough opportunity for transferring the photosynthesis matters as well as the genetic quality of this species. Hunter (1980) and Samadia (1993) confirm these results.

Corn diameter

The effect of cultivation date on corn diameter shows that the delay in cultivation date will result in corn diameter decrease so that the second cultivation date, i.e., 01/07/2011 the corn could have the highest thickness and in the fourth cultivation date it had the least thickness respectively (Table 2). The variance analyses of the table like the mentioned qualities showed that just the cultivation date effect has been statistically meaningful in 0/5 level (table 1). The specie effect also revealed that 704 species with an average of 084/4 cm had the least corn diameter respectively (table 3). This shows that the more the vegetation (growth) period is, the more photosynthesis matters are produced. As a result the speed of source transferring to the reservoir increase. The 540 species in four cultivation dates has been followed by 4/0 cm changes; whereas, the species 704 changes domains has been 13/1 centimeters. Murb Shabestri (1990) and Kazemi et.al (1998) also emphasized the cultivation date effects on corn diameter, but Nurmohamadi & et. al (2001) doesn't know the cultivation date effect on corn diameter meaningful.

Corn wood thickness

The findings of table 1 show that the species and cultivation date effect as well as the mutual influence of these two factors didn't show a meaningful difference. The maximum and minimum of corn wood thickness were. Related to the second cultivation date (325/2 cm) and the fourth cultivation date (197/2 cm) respectively (table 2). Perhaps environmental factors such as temperature and insufficient light have culminated in the corn wood thickness in the fourth cultivation date. Domain changes relevant to this quality from the most to the least was about 3/0 centimeters or 3 millimeters and this shows that measuring this quality is required for viewing the difference between the species cultivation dates.

Bush wet weight

There was a meaningful difference between various cultivation dates viewing this quality (Table 1). In the fourth cultivation date (01/08/2011) for severe decrease in temperature at the end of the vegetation season and accumulation of seeds there was not enough time for the bush growth and consequently the bush wet weight decreased in comparison to other cultivation dates (table 2). In this experiment it was known. That the more the vegetation period is, the more the green matter is produced so that 704 species composed the highest wet weight of the bush (table 3). The later matured had higher weights due to having water, nourishment, temperature, light and photosynthesis matters. The more the seeding period, the more stock store and therefore the more bush weight will be as the result (Shabstari& et. al. 1989 and Sarmadi et al (1995).

Bush dried weight

According to the results shown in table 1 it was clarified that the effects of cultivation date on bush wet weight has been meaningful in %1 level, but a meaningful difference was not seen between the cultivation date and species mutual effects. This shows that the numbers in various cultivation dates do not show a regular changes trend on this quality. The bush dried weight like other qualities under study received the utmost amount in the second cultivation date and the highest maximum of the dried matter was related to 704 SC. Therefore, the longer the growth (vegetation) period and the species mature later, the amount of food (nourish) stock will be more and the function of the dried matter increase consequently. As well, it can be said that the bush dried weight is a subcategory of the bush wet weight (if the 704 species have the highest bush weight) (Table 2). Peters et al (1971) stated that the dried matter aggregation in 704 was meaningfully more than 604, so; there is a meaningful difference between the cultivation date and the dried aggregated matter.

Corn weight

The effect of cultivation date corn weight has been 5 percent meaningful and this shows that we have had various corn weights in various cultivation dates. That is, there is a meaningful difference of 5 levels between various species under study while a meaningful difference between species mutual effect and the cultivation date was not seen (table 1). The results of comparison averages showed that in the fourth cultivation date, the corn has had the most weight in 20/5/90 and was put in a raw, while a meaningful difference was not seen between the first and second cultivation dates, but in the 01/08/2011 for decreasing the length of corn vegetation, the weight of the corn decreased dramatically (table 3). The species of 704 with an average of 4/25 gram in group and the two other species with equal weight were in group b (table 3). Environmental factors such as vegetation length, temperature degree, nourishment and water affected corn weight positively (sarmadnia, 1995 and Chogan et al, 2009).

The leaf level quality

The effect of the delay in cultivation date on the leaf level shows that this causes the sever decrease in leaf quality and it was %1 meaningful between cultivation dates. Meanwhile, a meaningful difference of %5 level was seen in the mutual effects of the species and cultivation date; whereas, there was no meaningful difference between the various species (table 1). The lowest leaf quality was related to the fourth cultivation date (283/5) and this shows that cultivation date postponing because of vegetation length period, temperature results in leaf level quality and this will also helps decrease the function in the cultivation date (table 2). Other researchers like Moniee(2003), Hunter (1980), Mokhtarapur (1997) and Sinkliber (1984) also reported the leaf level quality decrease in relation to the delay in cultivation.

Table 1. The variance analysis of the measuring qualities

Mean-square				
FD	Corn height	Bush height	Corn length	Sources of variation
754/4	524/347	323/234	3	Block
*878/35	*548/949	*937/758	3	Cultivation date
620/8	567/176	191/119	9	A error
Ns538/3	ns586/700	Ns718/97	2	Species
Ns116/5	Ns713/58	Ns237/48	6	Cultivation date species
375/5	600/290	244/131	24	B error
%38/12	%48/10	%92/15	-	Correlation variance

ns-* - **They were meaningfully and meaninglessly different in %1 and %5 level respectively

Table 2. the analysis of measuring qualities

Mean-square				
FD	Bush wet height	Corn wood diameter	Corn diameter	Sources of variation
754/17917	010/0	060/0	3	Block
**941/139497	Ns036/0	*696/0	3	Cultivation date
674/15418	Ns34/0	620/8	9	A error
Ns253/11139	Ns008/0	Ns538/3	2	Species
Ns139/47621	Ns15	Ns116/5	6	Cultivation date species
101/16939	Ns015/0	375/5	24	B error
%29/39	%62/5	%38/19	-	Correlation variance

ns-* - **They were meaningfully and meaninglessly different in %1 and %5 level respectively

Table 3. The variance analysis of measuring qualities

Mean-square	Bush wet height	Corn wood diameter	Corn diameter	Sources of variation
FD				
073/0	754/4	676/2970	3	Block
**831/2	*878/35	**335/21378	3	Cultivation date
179/0	620/8	957/1665	9	A error
Ns003/0	538/3	Ns728/2845	2	Species
*205/0	Ns116/5	Ns872/1839	6	Cultivation date species
047/0	375/5	485/1829	24	B error
%68/3	%68/3	%63/22	-	Correlation variance

ns-* - **They were meaningfully and meaninglessly different in %1 and %5 level respectively

CONCLUSION

In conclusion it should be said that between the under investigation cultivation dates, the first cultivation date (01/07/2011) was recognized as a proper and suitable time and opportunity for producing foodstuff (grass) due to leaf level quality increase. Meanwhile, among under study qualities the species 704 in the first cultivation (01/07/2011) will have a better giving foodstuff (grass) function as well as a good seed production due to leaf level quality increase, bush weight increase and aggregation of dried mater as well as high biological function. In reality, it should be said that the cultivation dates effect will affect both foodstuff function and seed function.

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