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Study of iron and zinc micro- cores on single grass corn function

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ABSTRACT

Stady of iron and Zinc effect on function of three Kind of flint Corn(704,770,7020) experimentally , on factorial base , has been done in the framework of completely random blocks in 4 resptition , at Sistan Dist ., in 2010. Three kind of flint corn (v_1= 704, v_2= 770 , v_3= 7020) were considered as figures factors and fertilizer factors , including (F1= Witness ,F2= Zinc sulphate , F3= iron sulphate , F4= iron sulphate + Zinc sulphate , as the second factors . Results demonstrate that fertilizer treatment have no significant effect on Wight of 100 seeds, function of seed , biologic function harvest index , and protein percentage . Result of variance isolation show that harvest index was different and difference of interaction between figures and fertilizer treatments on the harvest index was significant in 5%.

Key words: flint corn, iron and zinc, function, percentage protein, harvest index.

INTRODUCTION

On of the useful methods to increase function of crops is increasing of nutrition based on their physiologic properties. Of one hand , providing the plant's necessary nutrition , its function will be increased and on the other hand , increasing of osmotic pressure of soil product , increase the problems of plant's needs to water and nutrition and growth of it will be stopped. Applying useful fertilizer and preventing from excess usage or imbalanced representation and using accurate method of propagation, we could survive the plant against harms. Iron and zinc micro cores have role in nutrition of corn more than other elements. Iron in cytocrom as a vehicle for electron in photosynthesis systems interferes in respiratory, oxidation , revival and fabrication of chlorophyll malakouti & tehrani[6]. This plant includes in the plants that are focused, particularly after emergence of hybrid figures with high function and desirable quality , most of research institution s around the world research on this crop by investment value. Corn, after wheat and rice, is the third crop in the world about harvest and second product about amount of production. Our country 's farming soils have lost of iron and zinc micro- cores for several reasons; some of the reasons are : calcareous soils, water bicarbonate characteristic,shortage of water in the farms, and low organic matters in the soils, because of the said matters, absorption

of micro –cores elements especially Zinc (Zn) and iron (Fe) are not done by the plants root and / or providing absorption , because of high PH of cellular sap , sediment in the vessel , they would not reach to edible parts (leave, fruit and seed) . Corn has a high fertilizing specification ; regarding the researches they react in application of low- consumption fertilizers , particularly zinc. Unloading part of the corns is a phenomenon that is observed in several farms. Different researches demonstrate that the main factor of this is thermal and moisture tensions during pollination ; but, others tested that it is because of nutritional factors. Between nutrition,zinc has an important role in pollination and inoculation and shortage of them will be resulted in decrease of seed production Ziyaian, [14]. According to Zirol [13], decrease of zinc in corns will cause yellowish of the leaves and whitening of veins, together with decreasing of function . tish et .al, [12] demonstrated that different types of corns have various mechanisms towards zinc shortage and sensitivity of different types is not equal. Khalil Mahaleh et.al ,[5] study effect of spraying low consumption elements on qualitative and quantitative specifications of soil corn 704 , in khoy, by spraying three micro- core elements of iron , zinc and manganese during bolting and tassel to increase function and improve qualitative specification s of hybrid corn 704 in khoy. Arefkhan et.al, [2], studied application of plough and zinc , altogether , on controlling weeds and function of corn towards witness. Rahimi and Mazaheri [8] investigated corn function towards iron and copper compositions and found that in appling various levels of spraying , the best function is spraying iron sulphate fertilizer 2.5 in 1000 1n 8^{th} fallacious stage . Malakouti [6] stated that shortage of micro-cores in most of the Asian countries , considering soil high PH , salinity stress , continuous drought , and imbalance planning of current irrigation , as well as zinc shortages , have the highest effects on the products . zinc could increase grain yield up to 50%. Ashoka etal [3] studied microelements effect and /or non – usage of organic fertilizers and found that using microelements results in increase of corn's length , weight, green fodders and grain yield . ardakani et.al[1] declare that different levels of nitrogen , iron and zinc have influence on growth , absorption of nutrition and percentage of field corn single grass 704; the highest protein , equal to 12.53 with application of 300 kg nitrogen in a hectare , together with 45 kg zinc sulphate plus 4 kg iron sulphate in a hectare were obtained . Mirzashahi et.al[7], stated that among nutrition, boron and zinc have important effects in pollination and inoculation ; shortage of these elements will decrease function of flint corn seeds.

MATERIALS AND METHODS

This test have been done in Research center of Sistan university in 2010, located at chahnimeh , 30 km of southeastern part of Zabol in geographical position: eastern length 61 ^{0} 41" and northern width 30 ^{0} 54 ", and 480 m of height from sea level. This test was executed on factorial base by completely random blocks with 4 repetitions each repetition includes 12 plots. Three kinds of single grass corn (v_1= 704 , v_2= 770, v_3 = 7020) and 4 fertilizing levels (f_1= witness , f_2 = zinc sulpate , f_3= iron sulphate , f_4 = zinc sulphate + iron sulphate) were considered land was ploughed on July 2010 and necessary action were taken about removing weeds , Land grading and also fertilizing based an soil testing . stand was considered as 55000 bushes in a hectare .Each testing plot has 4 rows distance between the rows as 20 cm. measuring of each plot was 12 sq, meters. Irrigation was done based on local tradition and need of corns, every 7 days. In growth time, encountering weed, hand cultivating was done two times. Result of soil analysis before plan implementation:

Table1-Results of soil testing before implementation

Depth 0-30	Physical & chemical properties of soil
2/7	(Ds/m)EC
8/38	Ph
16/2	%T.N.V
0/35	%o.c
0/03	%Total
11	Ava p ppm
112	Ava k ppm
16	%Clay
Silt loam	Tissue

Measurement was done of the two medial lines of each plot and bush,s height indexes , flag leaf width, and number of leaves , stem diameter , corn diameter , corn size,peduncle length ,biologic function , harvest index, and grin yield were studied.

In other to analysis of data variance and comparison of treatments, MSTAT-C Software was used and treatments averages were compared by Duncan Test in 5% probability level . Excel softwere was used for drawing diagrams.

RESULT AND DISCUTION

Biologic Function: as a result of biologic function variance analysis, there is no significant difference about figures, fertilizing treatment and interaction between figures and fertilizer treatments.(Teble1).

Weight of 100 Seeds :about Weight of 100 seeds, there was a significant difference between figures in 1% probability level, in a way that v3 (7020) has the highest weight of 100 seeds (Diagram 1).

Grain yield: There was significant difference between flint corn figures about grain yield in 5% probability level , in a way that V3 (7020) with average of 28.92 has the highest grain yield. In the present test, fertilizing treatment has no significant effect on grain yield; while, Bahrevar et.al[4] study nutrition elements effect including iron , zinc, magnesium, and potassium on function on corn (704). Appliction of zinc and iron will increase 450 and 550 kg of flint corn in a hectare, respectively. Also, usage of zinc increase corn production , increase of concentraction and absorption of zinc . Coincidence usage of zinc and iron will result in 24% increase of corn function . More ever considered effect of zinc and potassium sulphate on growth and function of flint corn. Regarding importance of flint cron in poultry 's feeding improve of plant feeding by usage of necessary elements, including potassium and zinc , are necessary to increase seeds function . Increase of corn grain yield will be obtained by application of zinc sulphate fertilizer up to 30% and potash fertilizer as 40%. P uteziski et.al[11] studied spraying of zinc on corn seeds and found that it will increase grain yield up to18%(Diagram2) .

Harvest index: Analysis of harvest index shows that there is significant difference between figures in 5% probability level and 7020 has the highest harvest index. Fertilizing treatments have no significant influence on the harvest index. There is significant difference about interaction between figures and fertilizing treatment in 5% and 7020 was in the highest rank in

zinc sulphate Fertilizing treatment (Diagrams 4-5) . Results of this examination were the same as results of effect of iron and zinc on wheat, which was done by Solemani et . al[9].(Diagram 3-4).

Teble2:Result of variance analysis of different flint corns properties in various fertilizer levels

Sources of variation	Degree of Free			Mean squres		
		100 Grain yield	Biologic yield	Protein%	Grain yield	Harvest index
Repetition	3	13.958	0.185	0.014	729.369**	5738751.381**
Kind	2	30.672**	0.070	8.764**	239.064*	448918.053*
Fertilizer	3	4.142	0.036	1.282	56.615	448918.053
Figure×Fertilizer	6	1.895	0.226	1.688	162.744	3005855.842*
Error	33	3.723	0.125	0.931	67.073	928548.900
cv%		22.01	34.84	6.83	33.12	36.33

**,*:*Significant at the 1% and 5% levels of probability , respectively.*

Fig1:effect variety on 100 grain.

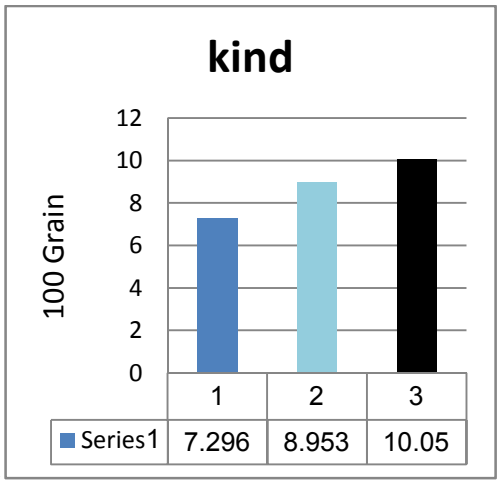


Fig2: effect variety on grain yield.

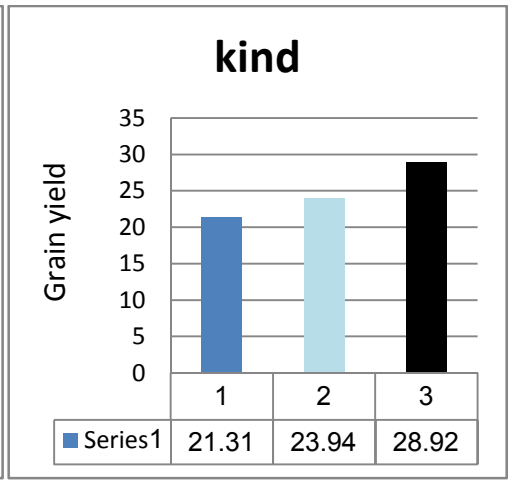


Fig3:effect variety on harvest index.

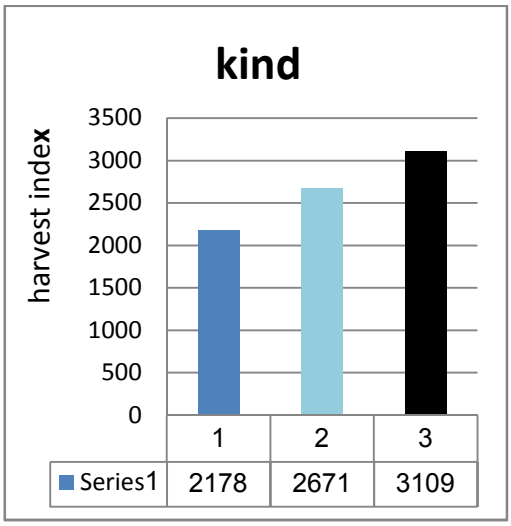
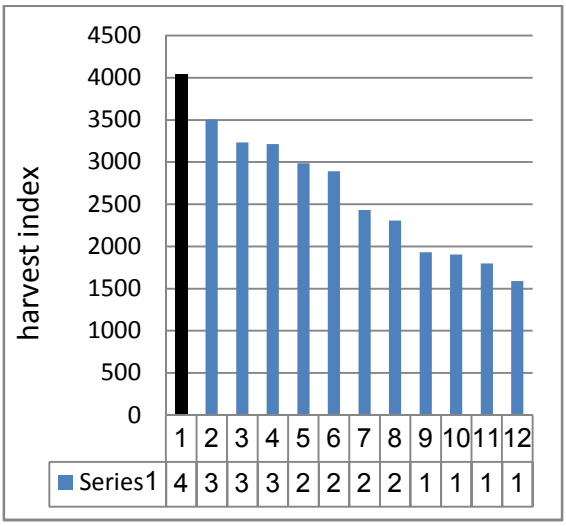


Fig4:effect interaction of variety and fertilizer on harvest index.



Protein Percentage: Results of bush variance analysis demonstrated that there is significant difference between experimental figures in 1% probability level and 704 and 770 are placed in

the same level. there is no significant difference between fertilizing treatment and interaction of treatment and figures. In a study by Ardakani et.al [1] , different levels of nitrogen , iron and zinc in nutrition absorption and protein percentage of field corn single grass , 704 has the highest protein percentage as 12.53 with application of 300 kg net nitrogen in hectare together with 45kg zinc sulphate , plus 4kg iron sulphate in hectare (Sheikh Beglou et.al[10]. In stydy of spraying effect of zinc on qualitative and quantitative function of flint corn , under water stress, it is demonstrated that the highest protein percentage of oil seed was in spraying of zinc sulphate(Diagram 5).

Teble3:comparison of average of evaluated properties in various flint corns

Experimental factors	Weight of 100 Grains	Biologic yield	Protein%	Grain yield	Harvest index
Kind					
704	7.296(B)		14.66(A)	21.31(B)	2178
770	8.953(AB)		14.45(A)	23.94(AB)	2671
7020	10.05(A)		13.29(B)	28.92(A)	3109
Fertilizer					
Witness					
Iron sulphate					
Zinc sulphate					
Zinc sulphate+iron sulphate					4043(A)

**statistically , means differences with similar letters, in each column , are not significant based on Duncan test in 5% probability level.*

CONCLUSION

In the present paper, applying fertilizing treatments have no significant effect on the studied factors. Considering the above results , both 704 and 770 are appropriate for cultiavation in sistan region.

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