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Research Article

SOURCE – SINK RELATIONSHIP IN CORN AT THE COMBINATION APPLICATION OF CHEMICAL AND BIO PHOSPHORUS FERTILIZER

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ABSTRACT
To study the effect of different levels of nitrogen in combination with bio-fertilizer phosphate-yield corn single cross 704 split plot experiment based on randomized complete block design with three replications, Islamic Azad University, Isfahan was implemented in 2012. Treatments consisted of four levels of nitrogen (50,100,150,200) kg ha as the main plots and three levels of bio-manure to fertilize 2 (0,100,200) grams per hectare in sub-plots were. And Single cross 704 maize varieties were used in this experiment. Results of data analysis showed that the levels of nitrogen fertilizer in combination with bio-fertilizer phosphorus on grain yield was significant However, the leaf area index at Tassel, remobilization of assimilates, the leaf phosphorus, resource constraints, soil pH levels were not significant. The results showed that the highest mean grain yield between 200 and 150 kg per hectare of nitrogen fertilizer on nitrogen fertilizer is concerned. The results showed that the highest mean grain yield between 150 and 200 kg per hectare of nitrogen fertilizer on nitrogen fertilizer is concerned. The comparison showed that the level of 200 grams per hectare for bio-fertilizer, bio fertilizers greatest impact (6571/30 kg ha) on grain yield. Comparison also showed interactions of biological nitrogen fertilizer, the highest seed yield of 200 kg per hectare of nitrogen fertilizer treatments with bio-fertilizer treatments were obtained from 200 g per hectare and lowest with 4460/60 kg per hectare nitrogen fertilizer treatment of 100 kg hectare biological treatment of zero g.

Keywords: *Corn, Nitrogen Fertilizers, Phosphate Fertilizers, Bio, Resource Constraints*

INTRODUCTION
Sustainable agriculture as a farming system involves finding ways to reduce the dependence of farmers on agricultural institutions and lead to reduced degradation of the environment and is a balance between the generations Environmental problems resulting from the use of chemical fertilizers, energy and production costs, and their use of the most important issues in the world today (Ghalavand *et al.*, 1986). Although the use of bio-fertilizers for various reasons over the past few decades has fallen.
But today, due to excessive use of chemical fertilizers has caused problems, using them as an essential component of sustainable agriculture has been reintroduced (Alksandratvs, 2003). Bio-fertilizers, solid, semi-solid or liquid containing live microorganisms or their products, which are provided in relation to biological nitrogen or phosphorus, sulfur and other nutrients, especially micronutrients in soil are working. When consumed, the microorganisms in the root zone of the plant or colony formation and increasing the supply of nutrients to increase growth and are host plants (Amuagayi and Mostajeran, 2007). Currently, bio-fertilizers as an alternative to chemical fertilizers for improving soil fertility in sustainable agriculture are discussed Grains are important sources of human food supplier and chemical fertilizers are most needed (Zahir *et al.*, 1999). Organic phosphorus brand fertile 2 a bio-fertilizer containing two types of PSB Bacillus lentos species and is Pseudomonas putida. Thus, the two mechanisms that produce organic acids and acid phosphatase leads to the solution of soluble phosphorus compounds and are therefore attracted to the plant (Malbouyi, 1987). These bacteria are able to salinity and pH 5 to 11%, three and half percent to endure. Such circumstances make this fertilizer can be used in a range of different areas (Malbouyi, 1987). The biological importance of phosphorus fertilized 2 expression can be said that the use of 100 g per 100 kg of phosphorus chemical fertilizer efficiency is. This fertilizer also increases with LAD (leaf area duration) leading to is increased use of solar energy,

resulting in higher plant photosynthesis (Malbouyi, 1987). Nitrogen is the most important element in soil fertility, makes up the core of chemical fertilizers. Annual Soil considerable amounts of nitrogen in effect lose irrigation, causing them, the amount of nitrogen available to plants sharply reduce (Bashan, 1990).

MATERIALS AND METHODS

This Research was conducted in Branch of Islamic Azad University Research Farm latitude 32 degrees 40 minutes north and 51 degrees 48 minutes east longitude, and altitude 1555 m. Classification is based on the regional climate-dry coupon Long-term average annual rainfall and temperatures are very hot and dry summers, the region is 120 mm and 16 ° C. The experimental design was a split plot with 3 replications and experimental treatments consisted of four levels of N (50,100,150,200 kg per hectare) as main factor and three levels of bio-fertilizer phosphate fertilizer 2 (0 100 200 g per hectare) was designated as the subplot. The main plot length of 12 meters and a width of 3 m plots were classified. The main plot by Labor to manually specify a length of 4 meters and a width of 3 meters and a stream to irrigate farm was set between each repetition. After preparing the ground for two-thirds of the amount of urea was determined by the ground. The amount of fertilizer for each treatment (Table 1), respectively To apply the amount of bio-fertilizer, bio fertilizer treatments fertilized with manure than 2 soaked seeds were then planted. The amount of bio-fertilizer fertilize 2 (Table 2) were used. In this experiment characteristics such as light absorption at Tassel, leaf area index Tassel time, remobilization of assimilates, the leaf phosphorus content, grain yield and soil pH levels were measured resource constraints.

Source Constraints

Completion time of pollination of two plants in each plot were randomly selected plant was opened, and husk corn and half the ear was cut transversally And was removed from the cob with husk impregnated with paraffin wrap the yarn around the ear pods were returned to the initial state During ripe corn the that half of it was cut at the end of pollination, harvest and seed weight as a potential weight were measured. The mean weight of the control Corn flakes was identified and then the following formula was used to calculate the resource constraints. % Average grain yield potential resource constraints= Average grain yield potential - Average weight control / Average grain yield potential *100. The results of each trait was measured using the software MSTAT-C were analyzed and the results were compared with Down can test (s) and interaction effects were examined.

RESULTS AND DISCUSSION

Results

Light Percent of Absorption

Based on the analysis of variance showed a significant is not effect of any treatments on light absorption (Table 1). Nitrogen fertilizer levels showed that absorb light at different levels of nitrogen fertilizer with a range from 90/15 to 92/75 percent were no statistically significant differences within a group. Biological phosphorus fertilizer mean comparison showed that the least amount of light absorbed by 90/86, respectively bio-fertilizer treatment of 100 kg per hectare and a maximum percentage of light absorbed by the 91/61 were obtained from the treatment without bio-fertilizer which did not differ significantly (Table 2). The mean Biological interactions nitrogen fertilizer showed the highest percentage of light absorbed by the 93/79 level of 200 kg per hectare of nitrogen fertilizer; bio fertilizer was achieved with 200 g hectare And less well with the 88/527 in the treatment of 150 kg N ha with 200 hectare bio obtained showed no significant differences in the level of five percent, though the variance analysis table interaction, bio nitrogen fertilizers for this trait was not significant.

Leaf Area Index

Significant differences between levels of nitrogen fertilizer, bio-fertilizer levels and their interaction for yield Leaf area index was observed (Table 1). According to the comparison results, the interaction of bio nitrogen fertilizer phosphorus, maximum Leaf area index of treatment of 100 kg per hectare of nitrogen fertilizer, bio fertilizers obtained with 200 kg hectare While the lowest Leaf area index treatment of 200

kg per hectare of nitrogen fertilizer which is bio-fertilizer with zero grams did not show statistically significant differences (Figure 2).

Remobilization of Photosynthesis

Analysis of variance (Table 1) showed that the simple effect of nitrogen fertilizer had a significant effect on the remobilization of photosynthetic while the simple effect of bio-fertilizer and bio-fertilizer nitrogen interaction was not significant for this trait. Comparison showed that the highest remobilization of photosynthetic nitrogen fertilizer and 100 kg per ha of nitrogen were 150 and 50 kg ha the three levels of fertilizer were placed in one group (Table 2). The levels of bio-fertilizer, bio-fertilizer levels g ha had the highest average and lower than average amounts of fertilizer, but all three were in a group And no statistical differences were found (Table 2). Mean comparison of interaction effects showed that the highest percentage of bio-fertilizer nitrogen remobilization of photosynthetic nitrogen fertilizer level of 200 kg ha-ha to 100 g were obtained from biological And the lowest value in the treatment of 150 kg N ha with 200 ha biological obtained were not significantly different.

Leaf Phosphorus

Analysis of variance showed that different levels of nitrogen in the five percent level had no significant effect on leaf phosphorus while the effect of bio-fertilizer and their interaction on leaf phosphorus was not significant (Table 1). Comparisons showed that the mean effect of the nitrogen fertilizer Phosphorus leaves in treatment of 100 kg per hectare per cent level was significant (Table 2). Comparison of bio-fertilizer and nitrogen Mean interactions in the first rank of the average treatment (100 kg N and 200 g of bio-fertilizer) devoted significant difference was observed between all treatments (Figure 4-18).

Source Constraints

Analysis of variance (Table 1) showed that the simple effect of nitrogen fertilizer and bio-fertilizer had no significant effect on resource constraints. While the interaction of biological nitrogen fertilizer is not significant for this trait comparison showed that the most resource limits (Table 2) between the levels of bio-fertilizers, bio-fertilizer is related to the level of 200g hectare and they were in a group. The comparison showed that the nitrogen levels of 50, 150 and 200 kg nitrogen per hectare had the greatest impact on resource restrictions were put in a group with 100 kilograms of fertilizer per hectare of nitrogen fertilizer level had significant difference (see Table 2).

The Grain Yield

Variance (Table 1) showed that the simple effect of nitrogen fertilizer, bio-fertilizer and bio-fertilizer nitrogen interaction on grain yield is a significant comparison showed that the highest grain yield (Table 2) between 200 and 150 kg per hectare of nitrogen fertilizer on nitrogen fertilizer is concerned and two others had the same effect in a group of patients. The comparison showed that the level of 200 grams per hectare for bio-fertilizer, bio fertilizer had the greatest effect on grain yield And the functional equivalent of 6571/30 grams per square meter were obtained (Table 2).

The interaction between nitrogen fertilizers, bio comparison showed that the highest seed yield of 200 kg per hectare of nitrogen fertilizer treatments with bio-fertilizer treatments were obtained from 200 g hectare And lowest with the 4460/60 grams per square meter in the treatment of 100 kg per hectare of nitrogen fertilizer with zero grams of treated bio-fertilizer per hectare, respectively.

Discussion

Light Percent of Absorption

Light absorption of physiological parameters in maize affected by nitrogen fertilizers and bio-fertilizer that is causing photosynthesis and ultimately increase the performance is better. Influence of light, photosynthetic activity, light use efficiency, dry matter partitioning to reproductive organs, leaf area index, leaf area duration and crop growth rate are affected by nitrogen (Keks *et al.*, 1993).

\But in this study, none of these traits was not affected by nitrogen and bio-fertilizer, although a decreasing trend was observed but was not significant. The reason for the choice of inappropriate levels of nitrogen fertilizer and bio-fertilizer and increase the amount of phosphorus in the soil and soil salinity can be.

Leaf Area Index

Significant increase Leaf area index of corn nitrogen rate increased by Hani *et al.*, (2006) have been reported. However, deselect the appropriate levels of nitrogen fertilizer and bio fertilizers addition to soil salinity and high soil P levels may be due This trait is not affected by any of the treatments.

Remobilization of photosynthetic.

Despov and Gagynas (1991), in an experiment and the accumulation of dry matter and nitrogen remobilization efficiency with the use of And nitrogen at different times on two cultivars of wheat bread and two double Rome studied and reported. Further production of dry matter at a thesis resulted in greater dry matter remobilization. In general, stem carbohydrates before and during the period of pollination are usually 10 to 30 percent of their dry seeds sent and in some of the grains are exposed to environmental stresses may be transmitted to more than 70% (Citrate *et al.*, 1998; Wang *et al.*, 1995).

Source Constraints

Assimilates from source to sink or place of production based on photosynthetic source capacity and sink one side and the other side is the balance between the will be reduced by Research on source-sink relations in maize with different treatments such as shading, reducing the number of leaves in the canopy angle light amplification arising from the plant has been (Hamid and Dabag, 1995). Reallocation of stem reserves to grain stress by Gouyina (1995) all vegetative organs of their growth period can act as a reservoir for the storage of assimilates. Since the close relationship between photosynthesis and storage of materials within a plant is there any change in environmental conditions that affect photosynthesis, construction and transportation may affect soluble carbohydrates. Analysis of variance showed that the simple effect of nitrogen fertilizer, bio also has a significant effect on resource constraints, while the interaction of biological nitrogen fertilizer is not significant for this trait. Comparison showed that the highest levels of resource constraints, bio-fertilizer, bio fertilizer is related to the level of 200 g ha And two others had the same effect in a group of patients. Most of bio-fertilizer causes high phosphorus according to their performance and not lose too much phosphorus absorption and increase resource limits.

Leaf Phosphorus

Leaf phosphorus levels are not significantly affected by nitrogen level and mean comparison showed that the five percent. The high levels of phosphorus and nitrogen in leaves of maize will increase. It seemed to increase the efficiency of nitrogen fertilizers and nitrogen with greater shoot growth and thus increased P sorption and subsequently transported to the plant and thus further increased the phosphorus has been leaves. A simple comparison of the average effect of nitrogen showed that the best treatment was 100 kg ha of nitrogen fertilizer on the surface, Leaf P increased Then again it could have been a decreasing trend to soil salinity, high levels of soil phosphorus and High levels of soil phosphorus and bio-fertilizer phosphate inefficiency at high levels of nitrogen and phosphorus in the soil is fertile -2. Heydari and Golpayegani (2012) in their research showed that drought stress increased, the amount of CAT and GPX enzymes and leaf chlorophyll content increased while the amount of APX ¬ enzymes ratio FV / FM decreased. He stated that using the Rayzobakteri drought stress conditions leading to improved antioxidant activity - and photosynthetic pigments were. So that the Pseudomonas species, was leading to a significant increase in CAT activity while in treatment, consisting of three species of bacteria, most of APX and GPX enzyme activity was observed.

Soil pH

In this study, nitrogen fertilizer and bio-fertilizer had no significant effect on soil ph. Eyidizade *et al.*, (2011) in their study showed that the use of bio-fertilizers on nutrient content and some chemical and physical properties of soil affect This means that after the application of bio-fertilizers, soil total N content of 100% chemical fertilizer treatments, respectively, 25% fertilizer + bio fertilized, chemical fertilizer + 50% bio-fertilizer and bio-fertilizer is 100% equal to 0/10 /0/11 0/12and 0/ 890respectively. The amount of available phosphorus in the soil also grew increasingly ¬. He also used to increase soil pH and lack of stabilization in the presence of potash fertilizer biological fertilizer increased availability of these elements found in the soil.

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Table 1: Analysis of variance of the effect of treatments on the characteristics

Grain yield	Leaf phosphorus	Resource constraints	Remobilization PHOTOMISSLE	The leaf area index at TASEL	Light absorption at TASAL	AMOUNT OF SOIL PH	DEGREE FREE	CHANGING RESORESE
/139 32226	0/002	44/08	0/21	0/21	28/33	0.038	2	REPITATION
/7** 3314840	0/0017*	568/84**	0/21	0/21	14/59	0/011	3	NITROGEN)(A
/97 155184	0/0004	60/71	0/87	0/87	11/61	0/014	6	ERROR A
** 1468926 1	0/0004	206/85**	0/39	0/39	1/73	0/01	2	P
/7** 2090093	0/0007	41/27	0/09	0/09	4/52	0/013	6	FERTILIZER
/51 131388	0/0004	21/76	0/41	0/41	9/31	0/007	16	ERROR B
6/81	6/34	7/32	14/67	14/67	3/34	1/004	2	CHANGING FACTOR

Mean Square

Table 2: Compares the average effects of treatments on evaluated traits

Resource constraints (Percent)	Soil pH levels	Grain yield (kg ha)	Leaf phosphorus (Percent)	Remobilization of assimilates (Percent)	LAI at TASAL	Light absorption at TASAL	Fertilizer N (kg ha)
ab/11 34	8/49	b4748/80	b0/34	a27/56	4/49	90/17	A1 150
b22/41	8/49	b4851/10	a0/36	a28/78	4/31	91/75	A2 100
a37/90	8/43	a5836/60	b0/33	a28/44	4/47	90/16	A3 150
a40/36	8/43	a5860/40	b0/34	b11/18	4/16	92/75	A4 200
a35/60	8/43	c4460/60	b0/34	26/17	4/15	91/61	B1 0
a36/56	8/49	b4940/70	ab0/34	26	43/4	90/86	B2 100
b28/93	8/45	a6571/30	a0/35	25	4/49	91/15	B3 200

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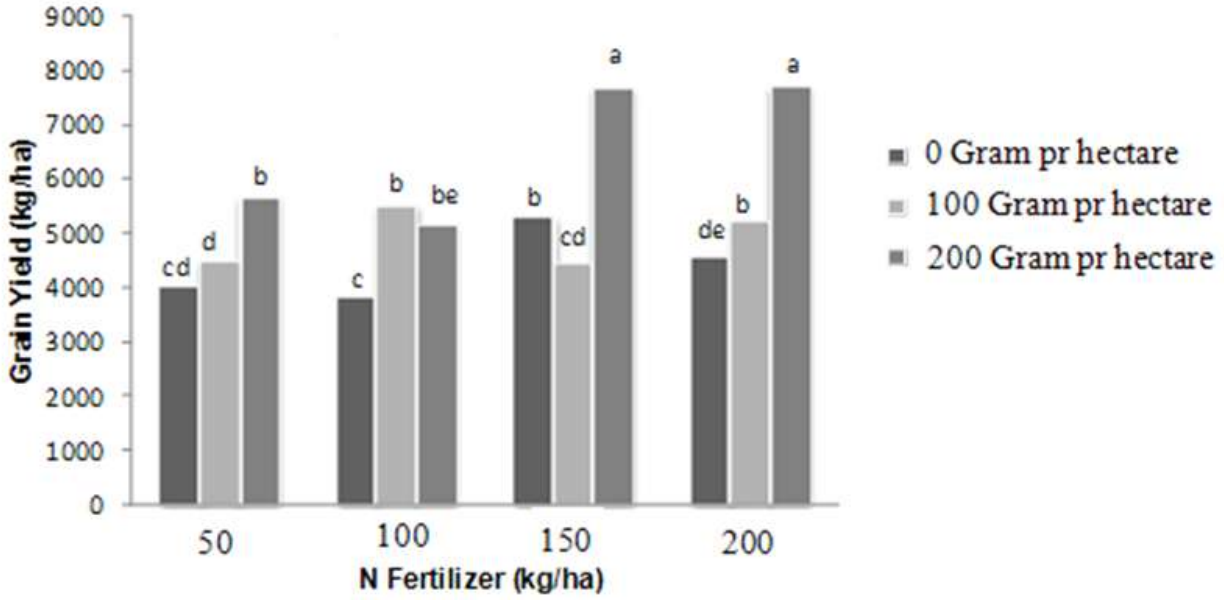

Figure

Chemical phosphate fertilizers in conventional farming the soil is used for deficiency, but in practice, a high percentage of soil amendments used in combination with ion ¬ and insoluble and non-absorbable to the plant are (Rakhzady *et al.*, 2004).

Conclusion

The results of this experiment showed which is associated with bio manure fertilizer can have positive effects on corn yield and yield components and yield of corn in this test was positive. Considering that, according to an annual test cannot be made recommendations based on the results of these experiments seem Bacterial compounds are used as bio-fertilizer, it can improve the product and increase its effectiveness and popularity in the country, is a good alternative to chemical fertilizers. In addition to increased production, increased security, agricultural soils and reduce environmental pollution is associated with If you order more tests and research to reach this achievement. The use of bio-fertilizer can increase the functionality of the application of fertilizers is looking for qualified plant brought To replace or associated with bio-fertilizer with chemical fertilizer to increase the yield of crops and the health of the environment with lower consumption of chemicals guaranteed.

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