Survey Simple Correlation, Yield and Yield Components of *(Cucurbita Pepo Var. Styrica)* Influenced by Treatments Different Bio –Fertilizer

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Abstract: In order to evaluate correlation, yield and yield components of (Cucurbita pepo var. Styrica) influenced by treatments different bio fertilizer, Experimental crop year 2010 at the Research Farm of Agriculture and Natural Resources Research Center of West Azarbaijan Randomized complete block design with 13 fertilizer treatments in 4 replications was performed, Analysis of variance showed the data The significant difference between treatments was observed in 1% probability level the highest percentage of 61% and oil yield 2634 (kg / ha) of 13 fertilizer treatments, Obtained. The highest amount of protein yield related to the treatment 13 as well as the lowest amount percentage and protein yield related to the treatment 4 (control) is. Highest percentage and lowest values of protein yield, respectively, 1976 (kg / ha) and 375 (kg / ha) is allocated to. According to this survey results yield of fertilizer treatment 13 (30 tons of Livestock Manure per ha, phosphate barvare(2) one hundred grams per ha+ Nitroxin fertilizer 1 liter per ha+Thiobacillus fertilizer 1.5 kg per ha) is recommended for increase yield quality and quantity of cucurbita. also results of simple correlation analysis between the traits studied in the cucurbita due to applied different biological fertilizer treatments showed The strong correlation between grain yield and oil yield and protein yield is very high so that with increasing amounts of oil and protein, grain yield is increased and also high correlation between oil yield and protein yield was significant means with increasing protein yield also amounts of oil increased as well as between protein yield and harvest index and number of branches high and significant correlation exists so that by increasing the number of branches and harvest index , protein yield increases.
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Introduction

Cucurbita is an annual and herbaceous plant. This plant is native to tropical and subtropical regions and from the America has spread to other parts of the world (25, 36). For optimum plant growth, nutrients must be available in sufficient and balanced quantities (10). Farming regions that emphasize heavy chemical application are led to adverse environmental, gricultural and health consequences Shehata and El-khawas, (29). Seeds of these plant are rich source of protein, oil and valuable active ingredients such as fatty acids, Phytosterols and Vitamin E. and from the active ingredients of that,drugs such as Peponen, Prostaliquid and gronfing for trait of prostate swelling and irritation urine is made(11). the amount of oil in seed is about 40 to 60 percent and most important fatty acid constituent the oil of this plant is linoleic acid 45 to 50 (19). One of the major problems of the cucurbita manufacturing is that low yield due to the weakness in manufacturing fruit of this plant given that this subjects the first fruit and its growth. In the cucurbits family plants as a strong physiological target for photosynthetic material acts, so the formation of next fruit limited and therefore makes it difficult for them to grow. In addition excessive growth of fruit in this plant causes to prevent the seeds formation in that or greatly reduce that (Robinson, 1993; Rylsky 1974). in the numerous references to the positive effect of organic fertilizers on the composition and extension of microbial communities, Fauna and flora of soil, and exacerbation of metabolic processes within the soil, root and plant foliage is emphasized (47 & 44,39). biological fertilizers exclusively are not applicable to organic fertilizers derived from livestock manure, plant additions and etc., but also production, obtained from the activity of microorganisms which are in the connection with nitrogen fixation and bioavailability of phosphorus and other nutrients, that are active in the soil, also includes (51,46). One of the possible options to reduce the use of chemical fertilizers could be use of bio and organic fertilizers. Biofertilizers are products containing living cells of different types of microorganisms which when, applied to seed, plant surface or soil, colonize the rhizosphere or the interior of the plant and promotes growth by converting nutritionally important elements (nitrogen, hosphorus) from unavailable to available form through biological process such as nitrogen fixation and solubilization of rock phosphate (27). Beneficial

microorganisms in biofertilizers accelerate and improve plant growth and protect plants from pest's anddiseases (13). To increase the availability of phosphorus and nitrogen for plant, large amounts of fertilizers are used on a regular basis soon after application of a large proportion of phosphorus fertilizer is rapidly immobilized and becomes unavailable to plants (37) and also, 25% of the applied nitrogen fertilizer is lost from the soil plant system through leaching, volatilization and denitrification (28). Symbiotic nitrogen fixer and phosphate solubilizing microorganisms play an important role in supplementing nitrogen and phosphorus to the plant, allowing a sustainable use of nitrogen and phosphate fertilizers (35). The fixed phosphorus in the soil can be solubilized by phosphate solubilizing bacteria (PSB), which have the capacity to convert inorganic unavailable phosphorus form to soluble forms HPO4 2-and H2PO- through the process of organic acid production, chelation and ion exchange reactions and make them available to plants. Therefore, the use of PSB in agricultural practice would not only offset the high cost of manufacturing phosphate fertilizers but would also mobilize insoluble in the fertilizers and soils to which they are applied (9, 6, and 11). Biological nitrogen fixation is one way of converting elemental nitrogen into plant usable form (21). Nitrogen-fixing bacteria (NFB) that function transform inert atmospheric N2 to organic compounds (8, 13). The ability of these bacteria to contribute to yields in crops is only partly a result of biological N2-fixation. The Mechanisms involved have a significant plant-growth promotion potential. In these relationships the bacteria receive non-specific hotosynthetic carbon from the plant and, in turn, provide the plant with fixed nitrogen, hormones, signal molecules, vitamins, iron, etc (24, 17). Previous studies showed that the combination of biofertilizers with organic or chemical fertilizers further enhanced the biomass and grain yield of crops (4, 1). Soils of arid and semi-arid regions have low organic carbon content and need organic amendments to improve their properties and consequently their productivity and natural fertility. Addition of organic matter, from different sources, improved physical and chemical properties of soil and consequently affects the growth and development of plant roots and shoots (12, 9).Although, information on the effect of animal manure and the other organic fertilizers on crop yield areavailable, farmers in the Iran rely on chemical fertilizers to maintain crop yield, and pay little attention to maintaining soil organic matter in soils in Iran (30). Some manure- bound nutrients are gradually released from the organic component of the manure. The release rates of these organic nutrients can conceivably be affected by the chemical nature of the manure and SOM that forms from the manure (20). The use of animal waste in maintaining soil organic matter is a popular practice in all parts of the world. It is not only a safe and effective way of recovery for lost plant nutrientslike nitrogen and phosphorus but also improves the physical and chemical attributes of the soil (3). Municipal solid waste can be composted to reduce the volume of waste and disease-causing organisms and to convert it in an organic-rich, soil-like product, through aerobic or anaerobic fermentation (16). The addition of municipal solid waste compost to agricultural soils has beneficial effects on crop development and yields by improving soil physical and biological properties (14). Positives effects of organic fertilizers on growth of pumpkin were reported in several studies (36,2) Economic and environmental problems caused by the indiscriminate use of chemical fertilizers and due to the inherent capabilities as well as very interesting and diverse creatures terricolous and especially microorganisms that caused one of the most important and useful fields of research in scientific studies, efforts to produce biological fertilizer (bio) is (5). The use of biological fertilizers in agricultural ecosystems with the purpose of eliminating or substantially reducing the use of chemical inputs, one of the main elements of sustainable agriculture is important in (31). Bashan and partners (8) showed that the use of Azotobacter causes to increase nitrogen content in grains. consumption of chemical fertilizers is one of the main objectives of sustainable production in agricultural ecosystems is, in this regard, this study had a survey on the effect of various biological fertilizers on morphological characteristics and yield of cucurbita plant was done.

Material and methods

This experiment in 1387 in Research Center for Agriculture and Natural Resources of West Azarbaijan with latitude 37 degrees 53 minutes North and longitude 45 degrees 10 minutes east and with a height of 1325 meters above sea level is carried out. The average annual precipitation of 236.7 mm and mean annual temperature is about 13.1 ° C is. Coldest and warmest months of the year to January and July respectively are.To determine soil characteristics, from zero to 30 cm depth were sampled and determined that the clay loam soil texture and pH equal to 7.9 is. Hydrometer method for determining soil texture and pH meter devices was used to determine the pH (Table 2- 1).

For preparing the soil of farm in autumn, moldboard plow land with deep plowing and in spring with favorable conditions , secondary tillage for the final seed bed preparation, was done by a cultivator.Research in a randomized complete block

design with 13 fertilizer treatments (Table 2) in four replications was done. Each plot consisted of five rows refer to distances of 100 cm from each other was. cucurbita seeds as univalve were planted 40 cm apart, 4 seed was planted in each hole and after emergence, plants were thinned and remained a strong plant.planting Wet planting (irrigation before planting) was done on 7 May. Rotted livestock manure before planting,were given to treatments intended,results achieved from livestock manure nutrients are presented in Table 3. Seeds after inoculation with bio-fertilizers were planted at a depth of 4 cm. any kind of poison not used on the farm. Operations against weeds were done two times,by hand and by mechanical method. Farm irrigation during the growing season due to weather conditions and phenological stages of plant at the appropriate time depending on the crop water requirement three times in 4 leaf stage, flowering and 100 percent of fruit set) was performed. Were harvested in late September and the main stem length traits, sub stem number, 1000 seeds weight, humid fruit yield, biological yield, seed yield, harvest index, oil and protein percentage and yield were measured.Statistical calculations were performed using MSTATC, SPSS-19 and Minitab software. Charts and statistical tables took place as Excel and Word software. Average under-study traits were compared using LSD test at 1% probability level.

According to the chart of scotter plot, seed yield kg per ha and protein yield regression line shows that the highest yield obtained from combination of treatment 13, that the most appropriate treatment combination. also treatment compounds 7,8 and 12 also are devoted the medium to high yield. And lowest yield amount is allocated to control treatment.

Results from this study showed that biological fertilizers combined with livestock manure treatments 7, 8, 9, 10, 11, 12 and 13 the best results in terms of oil and protein content and yield, main stem length, number of lateral branches , yield biological, seed and harvest index showed in cucurbita plant (Table3-2). Rotten livestock manure thoroughly supply the needed food of plants, also has a very important role in improving soil physical and is very effective in enhancing soil fertility, livestock manures have a main role in increasing soil humus and fertility of soil, use of this fertilizers improving gas exchange in soil, maintain water and nutrients in the soil, lightening the heavy soils and enhance the adhesion properties sandy soils and an increase of yield is efficient. yield increase in livestock manure treatments, perhaps due to increased activity of microorganisms, and release of some co2 in plants and in result that causes to photosynthesis of plant (31) were observed significantly enhancement in vegetative traits such as plant height, stem diameter and diameter, biological yield, oil percentage in seed and grain yield of sunflower in the result of application of bio fertilizers. They knew the reason for this increase in relation to improving soil structure which increasing soil water holding capacity, with proper ventilation and drainage and causes to root growth and nutrient uptake (Somasundaram etc, 32).

Table 1 Analysis of Some Physical and Chemical Characteristics of Soil, Experiment Place

Characteristic	Saturation S.P	Electrical conductivity	pH	Neutral Materials T.N.V	Organic matter	Phosphorus absorption	Potassium absorption	Sand	Silt	Clay	Soil texture
Unit	%	$Ds.m^{-1}$	-	%	%	ppm	ppm	%	%	%	-
Amount	56	0.117	7.91	29.8	1.5	16.4	222	13	46	41	loam Clay

Table 2 Fertilizer Treatments and Amount of Used Per Unit Area

Number	Treatment	Amount of Fertilizer per unit area
1	Phosphate Barvar 2 +Phosphorus fertilizer	Phosphate barvar 2 (100 gr/ha) +Phosphorus Fertilizer (60 kg/ ha)
2	Nitroxin	Nitroxin Fertilizer (Azotobacter) (1 liter/ha)
3	Thiobacillus	Thiobacillus Fertilizer(1.5 kg / ha)
4	Control	Non-use biological and chemical Fertilizers
5	NPK	Phosphorus Fertilizer(120 kg/ha)+ Potassium Fertilizer (100 kg/ha) + Nitrogen Fertilizer(60 kg/ha)
6	Livestock Manure	Livestock Manure (30 ton/ha)
7	Livestock Manure+Phosphate Barvar 2	Livestock Manure (30 ton/ha)+ Phosphate Barvar 2 (100gr/ha)
8	Livestock Manure+Nitroxin	Livestock Manure (30 ton/ha)+ Nitroxin Fertilizer (Azotobacter) (1 liter/ha)
9	Livestock Manure+ Thiobacillus	Livestock Manure (30 ton/ha)+ Thiobacillus Fertilizer(1.5 kg/ha)
10	Livestock Manure+ Nitroxin+Phosphate Barvar 2	Livestock Manure (30 ton/ha)+ Phosphate Barvar 2 (100gr/ha)+ Nitroxin Fertilizer (Azotobacter) (1 liter/ha)
11	Livestock Manure + Thiobacillus+Phosphate Barvar 2	Livestock Manure (30 ton/ha)+ Phosphate Barvar 2 (100gr/ha)+ Thiobacillus Fertilizer(1.5 kg/ha)
12	Livestock Manure + Nitroxin+ Thiobacillus	Livestock Manure (30 ton/ha)+ Nitroxin Fertilizer (Azotobacter) (1 liter/ha) + Thiobacillus Fertilizer (1.5 kg/ha)
13	Livestock Manure+ Thiobacillus+Nitroxin+Phosphate Barvar 2	Livestock Manure (30 ton/ha)+ Phosphate Barvar 2 (100gr/ha) + Nitroxin Fertilizer (Azotobacter) (1 liter/ha) + Thiobacillus Fertilizer (1.5 kg/ha)

Table 3 The Results Analysis Of Variance Of Fertilizer Treatments On Yield And Yield Components Of Cucurbita.

S.O.V	Mean of square						
	df	Seed Yield kg/ha	% Oil	Oil Yield kg/ha	% protein	Protein Yield Kg/ha	Length main Stem(m)
Replication	۳	۷۹۶۳,۲۱۸**	۰,۰۱۹ ns	۲۵٤۳,۸۰۸**	۰,۰۰۰۰۱ ns	۱۳۳٤,۸۹۰**	۰,۰۰٦ ns
Treatment	۱۲	۱۲۵۸٦۰۹,٦٩۸**	۱٦۳,۲۲٩**	۱۰۰۰۷۲۰,٦٦۵**	۲٤۲,٤۱۰ ns	۸٤٩۷٩۵,۲۸۲**	۳,۱۱٦**
Error	۳٦	۱۵٦٦,٦٤۰	۰,۰٤۷	۳۸۷,۷۰٦	۰,۰۰۱	۲٦٩,٦٦۲	۰,۰۰۳
% CV	-	۱,٤۲	۰,٤۱	۱,۳۰	۰,۰۱	۱,۳۷	۱,۵٦

ns, non-significant **, significant in 1% probability level.

Table 3 Continued.

S.O.V	Mean of square				
	df	Biologicdal Yield (ha)	HI	Count lateral branch	Length Lateral Stem(m)
Replication	۳	۰,۰۰۰۰۱ ns	۰,۲۵٤**	۰,۰۰۰۰۱ ns	۰,۰۰۱ ns
Treatment	۱۲	۲۰۲۱۳۲۹۳,۲٦٩ ns	۱۳,۷۷٦**	۲,٤۱۰ ns	۲,٤۱۸**
Error	۳٦	۰,۰۰۱	۰,۰۵۰	۰,۰۰۱	۰,۰۰۲
% CV	-	۰,۰۰۰۱	۱,٤٦	۰,۰۱	۱,٤۰

ns , non-significant **, significant in 1% probability level.

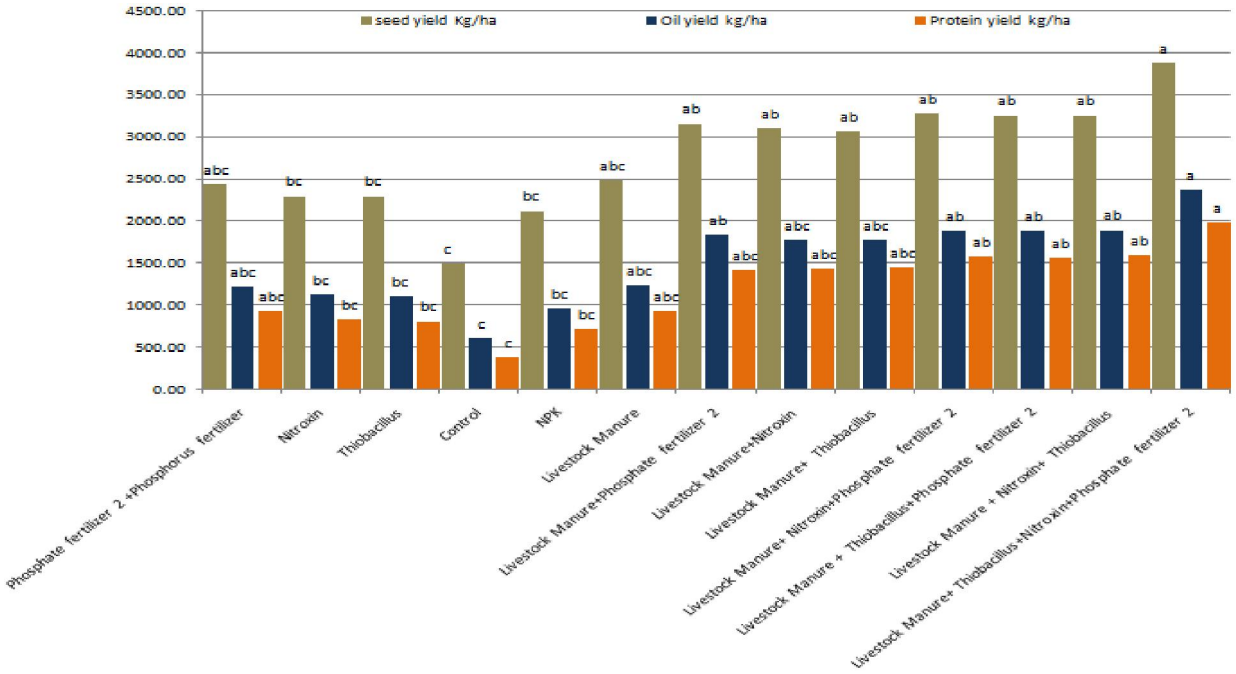

Figure 1 Effect of different fertilizer treatments on yield, seed protein of ucurbita
Dissimilar letters is Indicate significant differences at 1% probability level

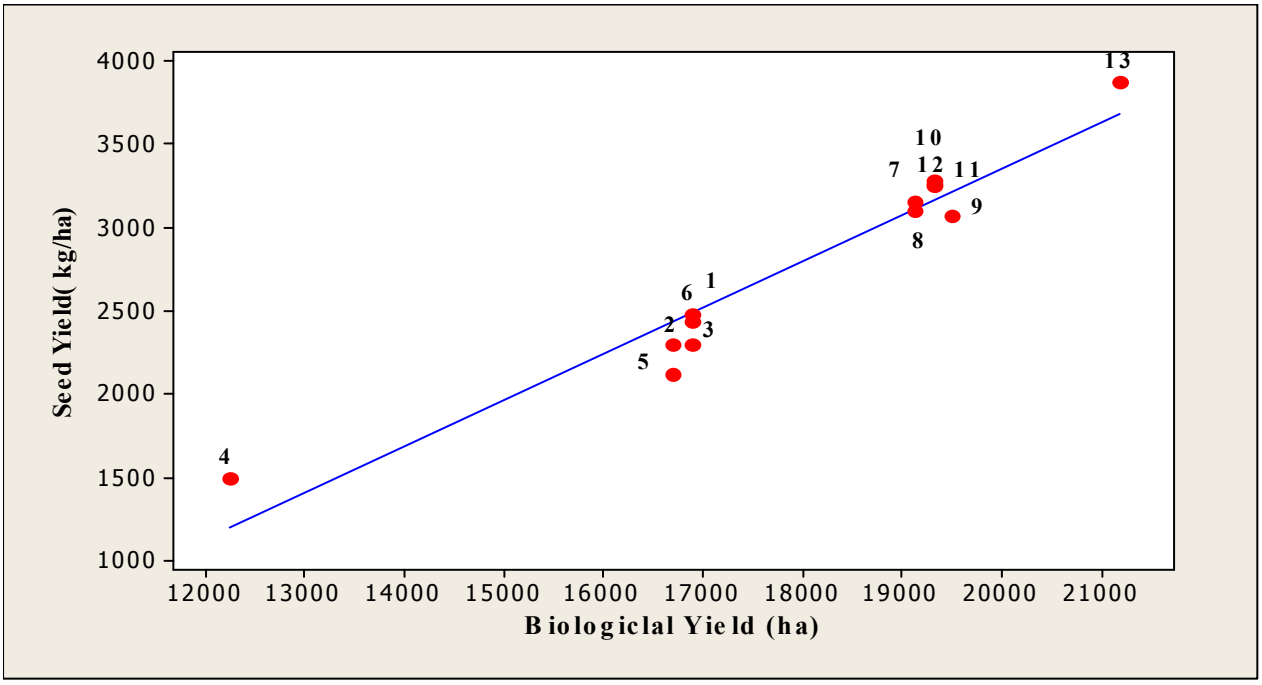

Figure 2 the scotter plot chart, linear regression of grain yield and biological yield under the effect of applied different fertilizer Treatments

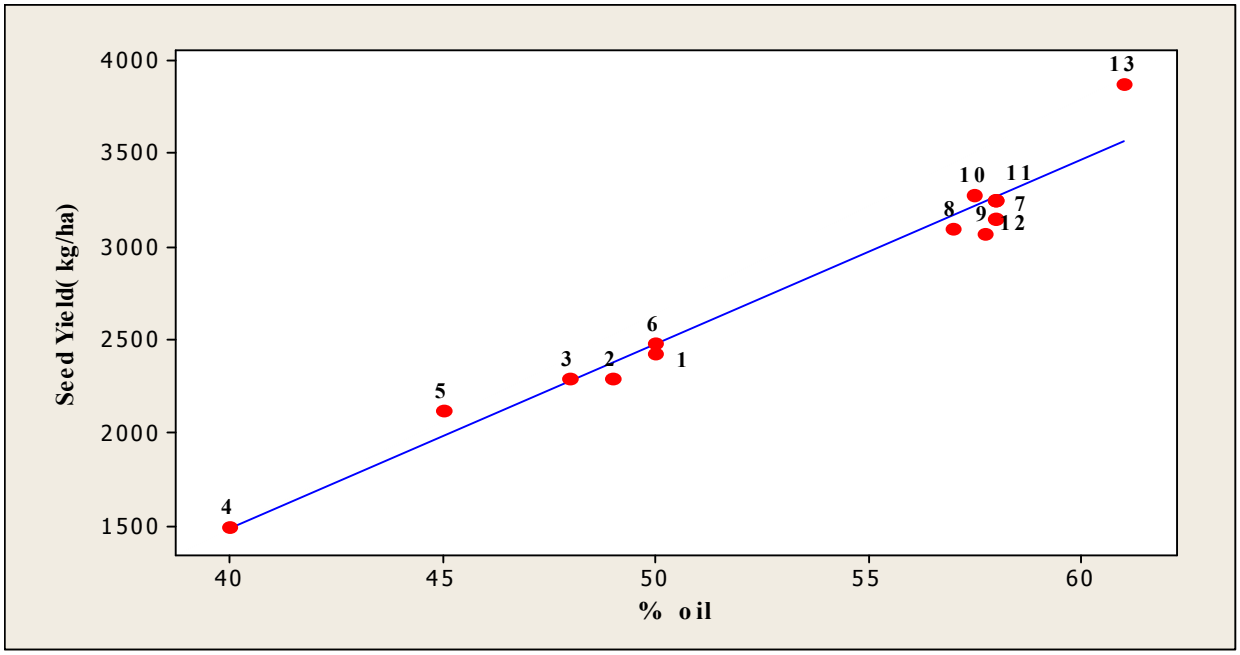

Figure 3 chart of scatter plot, linear regression of seed yield and oil percent under effect of different fertilizer treatments.

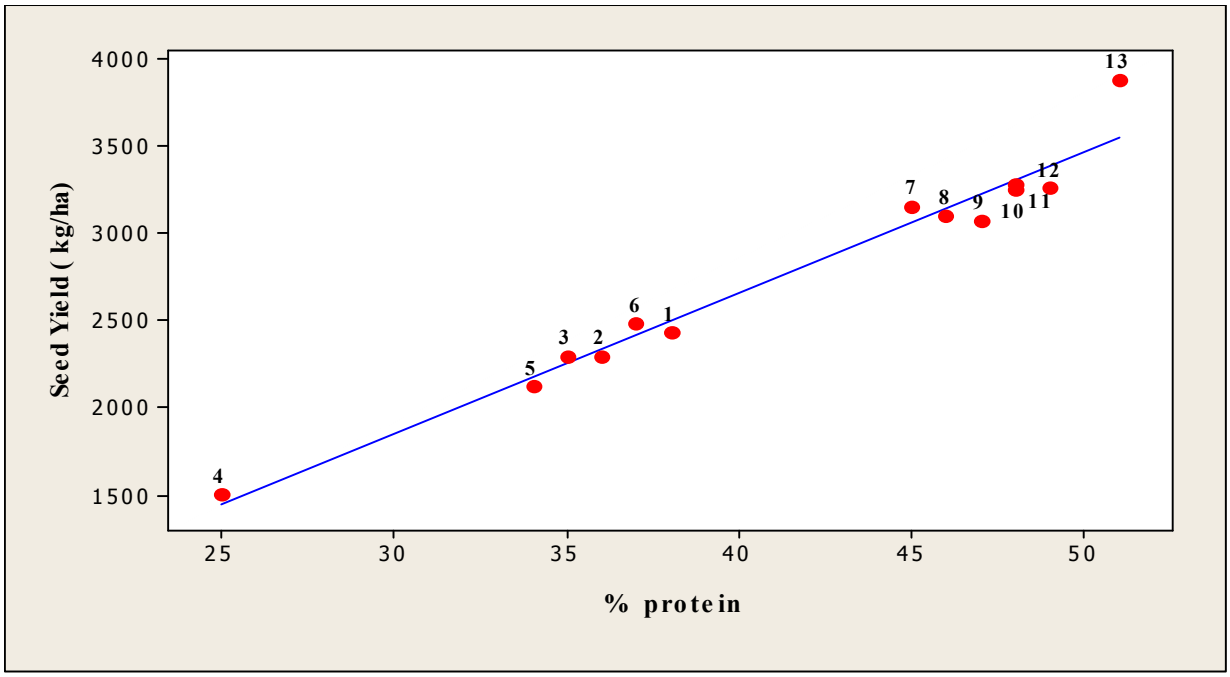

Figure 4 chart of scatter plot, linear regression of seed yield and protein percent under effect of different fertilizer treatments.

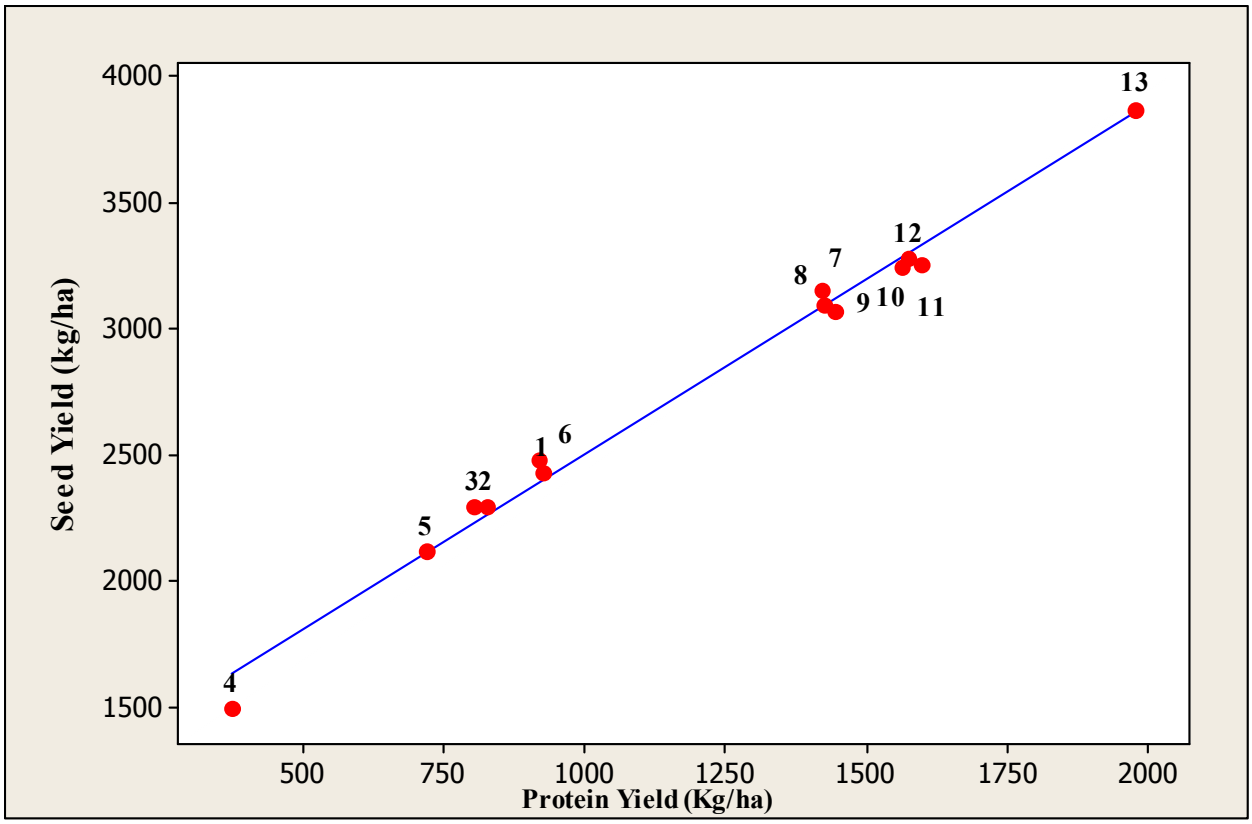

Figure 5 chart of scatter plot, linear regression of seed yield and protein yield under effect of different fertilizer treatments.

Table 4: Mean comparisons for measured traits

Treatment	Mean comparisons													
	Seed Yield kg/ha		% Oil		Oil Yield kg/ha		Protein Yield Kg/ha		Length main Stem(m)		Length Lateral Stem(m)		HI	
۱	۲٤۳٤	abc	٥۰/۰۰	abc	۱۲۱۷	abc	۹۲٤/۹	abc	۳/۰۷٥	abc	۲/۷۷٥	ab	۱٤/٤۲	abc
۲	۲۲۹۷	bc	٤۹/۰۰	abc	۱۱۲٥	bc	۸۲۳/۹	bc	۲/۸۰۰	bc	۲/٥٥۰	ab	۱۳/۷٦	bc
۳	۲۲۹۷	bc	٤۸/۰۰	abc	۱۱۰۲	bc	۸۰۳/۹	bc	۲/۷۰۰	bc	۲/٤۷٥	ab	۱۳/٦۱	bc
٤	۱٥۰۰	c	٤۰/۰۰	c	٦۰۰/۰	c	۳۷٥/۰	c	۱/۲٥۰	c	۱/۰۰۰	b	۱۲/۲۷	c
٥	۲۱۱۹	bc	٤٥/۰۰	bc	۹٥۳/٦	bc	۷۲۰/٥	bc	۲/٥۰۰	bc	۲/٤۲٥	ab	۱۲/۷۰	bc
٦	۲٤۸۲	abc	٥۰/۰۰	abc	۱۲٤۱	abc	۹۱۸/٤	abc	۳/۰۲٥	abc	۲/۷٥۰	ab	۱٤/۷۰	abc
۷	۳۱٥٤	ab	٥۸/۰۰	ab	۱۸۲۹	ab	۱٤۱۹	abc	۳/٥۲٥	ab	۳/۳۰۰	a	۱۷/٤۹	abc
۸	۳۰۹۹	ab	٥۷/۰۰	ab	۱۷٦۷	abc	۱٤۲٦	abc	۳/٥٥۰	ab	۳/٤۲٥	a	۱۷/۲۰	abc
۹	۳۰۷۰	ab	٥۷/۷٥	ab	۱۷۷۳	abc	۱٤٤۳	abc	۳/٦٥۰	ab	۳/٤۲٥	a	۱٥/۷٤	abc
۱۰	۳۲۷۹	ab	٥۷/٥۰	ab	۱۸۸٦	ab	۱٥۷٤	ab	۳/۷۰۰	ab	۳/٥۰۰	a	۱٦/۹۸	ab
۱۱	۳۲٥۲	ab	٥۸/۰۰	ab	۱۸۸٦	ab	۱٥۷۱	ab	۳/۷٥۰	ab	۳/٥۲٥	a	۱٦/۸٤	ab
۱۲	۳۲٥۷	ab	٥۸/۰۰	ab	۱۸۸۹	ab	۱٥۹٦	ab	۳/۸٥۰	ab	۳/٦۰۰	a	۱٦/۸٦	ab
۱۳	۳۸۷٥	a	٦۱/۰۰	a	۲۳۲٤	a	۱۹۷٦	a	٥/۰۰۰	a	٤/۰۰۰	a	۱۸/۲۹	a

Table 5: Simple linear correlation between the studied traits cucurbita, in applied different treatments of bio-fertilizers

	Seed Yield (kg/ha)	% Oil	Oil Yield kg/ha	% protein	Protein Yield (Kg/ha)	Length main tem(m)	Count lateral branch	Length Lateral stem(m)	Biologiclal Yield (ha)	HI
Seed Yield(kg/ha)	۱									
% Oil	۰/۹۸۲**	۱								
Oil Yield kg/ha	۰/۹۹۸**	۰/۹۸۳**	۱							
% protein	۰/۹۸۲**	۰/۹۸۸**	۰/۹۷۹**	۱						
Protein Yield(Kg/ha)	۰/۹۹٥**	۰/۹۷۷**	۰/۹۹۸**	۰/۹۸۳**	۱					
Length main tem(m)	۰/۹۷٤**	۰/۹٤۲**	۰/۹٦۲**	۰/۹٤۷**	۰/۹٥۸**	۱				
Count lateral branch	۰/۹۸٦**	۰/۹٦۰**	۰/۹۸٤**	۰/۹٦۲**	۰/۹۸۲**	۰/۹٦۸**	۱			
Length Lateral stem(m)	۰/۹٦۸**	۰/۹٦٥**	۰/۹٥۲**	۰/۹۷۸**	۰/۹٥۱**	۰/۹۷۱**	۰/۹٥٤**	۱		
Biologiclal Yield(ha)	۰/۹٦٥**	۰/۹٥۷**	۰/۹٥۱**	۰/۹٦۷**	۰/۹٤۷**	۰/۹٦۹**	۰/۹۷۱**	۰/۹۹۱**	۱	
HI	۰/۹۸۳**	۰/۹٦۹**	۰/۹۸۷**	۰/۹٦۰**	۰/۹۸٤**	۰/۹۳٦**	۰/۹٤٦**	۰/۹٦۳**	۰/۹۰٥**	۱

Increase in crop yield under the application of bio-fertilizers have been reported. the positive impact of bio fertilizers on growth and plant yield, not only because it provides essential elements in providing, Elements influencing of plant growth, like auxin, amino acids and vitamins that are By analyzing plant growth is stimulated (23) Yazdani and etc reported that the use of different types of chemical and bio fertilizers in the soil on oil percent, cilimarin and cilibin in seed of maritighal had a significant effect, so that the treatment (Silybum marianum) manure compost had the highest percentage of oil compared to other treatments, and then fertilizer treatments of Azotobacter and mix of Azotobacter and compost, had the highest percentage of oil, also chemical fertilizer treatment had the lowest percentage of cilibin. kennedy and etc (19) and use of Nitrazhin bio fertilizer caused to increase of 28% seed yield in comparision to control treatment, although between this treatment and mix of Nitrazhin and PSB, there was no statistically significant disorders.The results of three-years research of murkovic and etc was done in 1996 on 100 lines of cucurbita with the aim of achieving the varieties with high oil yield and high linoleic acid showed that the seed oil content and percentage of linoleic acid sequence is variable from 21%.They also - 56/5-39/5/67 and from 4 reported in a delay in harvesting and And the use of bio fertilizers the fruit and reducing the temperature,in stage of fruit maturity linoleic fatty acid amount of seed oil increases. Tajbakhsh and etc (34) in their report stated that if nitrogen usage at flowering time was in a suitable amount it can increase storage compounds and seed oils. recommendations of fertilizer treatment for medicinal plants should be done with considering to all effective conditions, because it a Fertilizer treatment may lead to increase of product whereas causes to reduce the amount of active ingredients of medicinal plants or the cause to change the material components. (Active ingredient that is not useful) (5) And (48 in all

these systems, bio fertilizers) biologic (as a natural alternative to chemical fertilizers, and undeniably positive role in the sustainable management (32,27) in this,has the soil and ultimately the whole system stability direction, the status of soil from organic matter and therefore the existing biodiversity. Biological fertilizers containing microorganisms which are capable of nutrients from unusable to usable form to convert and this conversion is done in a biological process. Biological fertilizers production cost is low and do not create pollution in the ecosystem, the consumption of these fertilizers not only increased yield but also decreased the use amount of chemical fertilizers, in research of Iranipour and etc (17, 38) on the impact of biological fertilizers on plants similar results achieved. the most common bio fertilizers, containing micro-organisms can point to Molecular nitrogen stabilizer bacteria(Diazotrophs) such as Azotobacters phosphate solubilizing microorganisms as phosphate barvar 2+(8), given that the consequences of leaching nitrogen and contamination of water resources and fixation of phosphorus and calcium compounds accumulate in alkaline soils and lime with aluminum and iron in acidic soils can have a profound impact in achieving the purpose of sustainable agriculture and have increased yield (33). Matsi and etc (21) showed that use of livestock manure can increase High consumption elements nitrogen, phosphorus and potassium accessibility.these results with the results of the research of the other researchers is consistent on other plants (34). However, use of livestock manure has a very important role in soil improving and compaction, in addition, adding livestock manure to soil leading to improve soil structure, fertility and increasing soil organic matter (22).

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