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Effect of Chemical Nitrogen, Vermi-Compost Bio Fertilizer, and Rhizobium Legminozarum Inoculation on the Yielding Components of Flava Beans

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ABSTRACT

This research is conducted to find out the applicability of Rhizobium legminosarum and vermi compost biochemical fertilizer to reduce chemical fertilizer's use in flava beans and make a comparison between Vermi Compost biochemical fertilizer application and Rhizobium legminosarum bacteria compare to mineral fertilizers in the quantitative and qualitative functioning of flava beans. The test is conducted in the form of factorial in blocks and randomly in the city of Behbahan with 3 times repetitions. The test elements consisted of Nitrogen fertilizer application in 3 different levels of 50, 75, and 100 percent of the area use, second element consisted of Vermi Compost bio-fertilizer in 3 different levels of 0, 5 and 10 tons in each hector and the 3rd seed's assimilation with Rhizobium bacteria in two levels of inoculation and without inoculation. Test results showed that Nitrogen chemical fertilizer in seeds functioning has a significant effect in the number of pods per plant and protein, but regarding the number of seeds in a plant and weight of each one thousand seeds, it is not significant and on the other side Rhizobium is significant only in one thousand seeds weight, but it is not significant in the other characteristics. Results from the average comparison according to "LSD" test show that most seeds functioning in nitrogen treatment with 65.7 kilograms in a Hectar belong to 25 kilograms treatment in a Hectar of nitrogen. In simple vermi compost treatment also the most seeds functioning is done with 67.9 kilograms in Hector with treatment of 5 tons vermi compost in a Hectar and the least seeds functioning with 60.2 kilograms in Hectar which belong to 10 Tons od compost in Hectar. the most pods in a bush belong to nitrogen treatments of 50 kilograms nitrogen in a Hectar and the least number of 37.5 kilograms nitrogen in a Hectar also the most percentage of protein in seeds are in treatment with Nitrogen with 23.75 with treatment of 25 kilograms nitrogen in a Hectar and the least percentage is in protein with 22.93 with the treatment of 50 kilograms of nitrogen in a Hectar. Reaction of Nitrogen to Vermi Compost in all the characteristics are significant and also it is the same interaction of Nitrogen to Rhizobium. In seeds functioning, number of seeds in a plant, number of pods in a bush and protein is significant, but it is not significant in one thousand seeds, and on the other hand interaction of Vermi Compost - Rhizobium is significant in all the characteristics, except in regard to number of seeds in a plant. Finally results show that use of 25 kilograms of pure Nitrogen and 5 tons of Vermi- Compost bio-fertilizer in a Hector gives the best result which is very important environmentally and economically since the amount of 50% of Nitrogen chemical fertilizer is being saved.

Keywords: Flava Beans; Nitrogen; Vermi Compost; Rhizobium; Functioning; Functioning Components

Introduction

Flava beans (Broad beans) is one of the oldest cultivated legumes which has been fascinating in human life and it is mainly cultivated for human consumption, especially in Asian and African countries. In all parts of Ethiopian Mediterranean areas and some parts of South America this food has been planted. In the recent years it has also become interesting in some of European, American and even Australian areas [1]. Cultivating land for Broad beans in Iran is about 30000 hectors with the average functioning of 5 tons per Hector and the amount of annual fertilities is about 50000 Tons. Flava Beans in one of the main product in the Khozistan province and it is mainly cultivated in the areas of Dezful, and Shoshtar. The amount of land cultivated with this product in Khozistan is about 4500 Hectars [2]. Beans and grains contain lots of proteins as such the amount of grains is different from 1.17 to 2.28 percent [1]. Flava beans is an annaul plant which is standing straight, strong and form (without pubes) and full of leaves with the height of almost between 30-180 cms. Its shoots are very strong and four squares and hollow with 1 to 7 base in a bush [1]. Nitrogen is the most used element in this plant and this is the most important element of production and limiting nutrition element in agricultural production in the world [3]. Morphological & physiological characteristics of the plant is especially under the influence of fertilizers especially Nitrogen fertilizer. Nitrogen fertilizers are important in increasing the agricultural production functioning through development of their aerial organs and also production of more carbohydrate material and also increase in the carbon absorption. Increase in the amount of nitrogen not only effects the growth, but also is effective on the main morphological parts of the [4,5]. mentioned that there should be an increase in different levels of Nitrogen use on the functioning and functioning components of flava beans and increasing the amount of nitrogen causes increase in the flava beans production. In the last few decades, since there has been a rapid increase in the population and therefore more demand for nutrient, the chemical fertilizers are being used as a tool for producing maximum food products at a high level of production and therefore it causes a serious damage to the environment [6]. On the other hand additional production and use of chemical production (such as chemical fertilizers, fungicides, pesticides Etc.....)in agriculture in the recent decades caused difficulties in the environmental conditions such as water and soil contaminations, reduction in the quality of food, break in the biological balance, in the soil, it causes destructive damages to the ecosystem [7]. The main solution for this problem is moving towards stable agriculture on the base of using more internal agricultural characteristics such as bio-fertilizers [8,9]. mentioned that biological fertilizers are called as fruiting materials which contain enough number of one type of useful microorganisms in the soil [6]. Bio-fertilizers have many advantages compare to chemical fertilizers. They don't produce poisonous and microbial materials. They proliferate rapidly and spontaneously and also cause physical and chemical corrections in the soil, they are more beneficial economically and more acceptable biologically [10]. Vermi compost is a type of organic hormonal fertilizer which is produced by a special earth worm. These useful animals are used for transferring different types of natural waste material such as plants remaining, animal waste food industries, companies waste material, city wastes and sewage sludge Etc.... into compost and the result has been satisfactory. These types of fertilizers contain vitamins, hormones, and other nutritious materials needed for plant growth which are without any kinds of bacterial contamination [11]. Figures 1 & 2 [12] in their research mentioned that the effect of vermi compost on the number of seeds in plant has effect of about 1% and on the number of plants in a bush is at the level of 5% which is significant but it is not significant on the seed's protein. [13]. mentioned the reasons for increase in the functioning by the vermi- compost fertilizer in maintenance of earth nutrition elements and protection of nitrogen from being washed by water, increase in the bio-functioning and improvement in earth makeup. Results from [14]. research show effectiveness of the vermi compost fertilizer as such that with the use of this fertilizer functioning of the components such as weight of every thousand seeds will increase rapidly. Now a days in programming for stable agricultural systems use of Rhizobium Regominoz is very important. Careful programming is conducted through the use of suitable Regominozes which is available in the agricultural use and replacing the single cultivation which is dependent on the chemical fertilizers [15]. Figure 3. Microbial inoculum have been successful in increasing the number of earth microbial society. The most prominent among them is inoculation of legumes with Rhizobium inoculum which in this way the product absorb the most nitrogen through increase in the biological nitrogen stability which is very much successful [16]. Figures 3 & 4. Analysis of the effect of nitrogen and inoculation of Rhizobium on the functioning and agricultural characteristics of peas at the rain fed condition showed that the effect of nitrogen level and interaction of nitrogen level and plants inoculation on each thousand seeds is significant at the level of 5% [17,18]. mentioned that use of inoculum can not only reduce the use of nitrogen fertilizers, but also can increase and give a better production with more percentage of proteins which is due to use of continuous inoculum Rhizobium and it also reduces the environmental contamination and also stops spending money on Nitrogen fertilizer. Human had value for the organic mineral elements from the old age for growth of plants and in the recent years considering the harmful materials in the food stuff and known characteristics of organic agriculture. The positive points of this method in relation to modern agriculture, bio-agriculture is being predominant. Now with regard to different and numerous points in using biological fertilizers and valuable characteristics of flava beans the best aims which are being followed in this research are:

1. Analysis of applicability of Rhizobium Legominozaroom and biological Vermi Compost to reduce the chemical fertilizer's use in Flava beans agriculture.

2. Comparing application of Vermi- Compost fertilizers and Rhizobium legominozaroom in relation to mineral fertilizer in qualitative and quantitative amount of Flava beans.

Figure 1: Vermicompost.

Figure 2: Worm casts.

Material and Methods

Test has of 30° 36′ north with the height of 320 meters from the sea level. Behbahn is an area with semi deserted climate and located in been conducted in the city of Behbahan in the southeast of Khozistan province with the longitude of 50° 12′ east and latitude STEPPE hot climate. Mean rain fall and 10 years temperature average equal to 313/5 millimeters and 25 degrees centigrade. The test is conducted in factorial random blocks with 3 times repetitions. Test factors consisted of first factor with nitrogen fertilizer in 3 levels of 50, 75 and 100 percent use in the area, second factor is vermi compost bio-fertilizer at 3 levels of witness (0), 5 tons in Hectar equal to 1 kilo gram in each PLOT which is 2 square meters and 10 tons equal to 2 kilo grams in each plot (in 2 square meters) Figures 1 & 2. The 3rd factor is inoculation of the seeds with Rhizobium bacteria at two levels of inoculation and without inoculation Figures 3 & 4. The inoculation method was such that the seeds were mixed with bacteria and then seeds were ready for plantation. Nitrogen fertilizer and vermi compost fertilizer were added to the earth according to map planed for different plots and then mixed with the earth. The land suggested was about 800 square meters and it was prepared well in the month of October for plantation. The cultivation was in the rows (FAROEE) and every treatment was repeated 3 times. Each test plot was consisting of 2 rows of 3 meters length and the space between each row was 60 cms. On each rows 2 line were planted and therefore each plot consisted of 4 lines of cultivation. After considering the place of test to determine the earth texture and physical and chemical characteristics, the earth for testing was selected, and then plotting and blocking were done, and vermi compost and nitrogen fertilizers were added according to what was mentioned before and with the use of shovel and other tools the earth was dug up to 30 cms and then mixed well and 3 rows of cultivation conducted in each plot. To determine the functioning components such as number of pods in each bush and number of seeds for each pods physiological consideration, 10 bushes were chosen randomly from each plot for testing and counted (evaluated) and averages of them were calculated. To measure the weight of every one thousand seeds, 5 samples were collected consisting of 200 seeds each and weighed by a weighing scale and registered. The final harvesting for all the treatment time has been conducted up to the time the leaves became yellow and fell and color of pods from green turned to brown Figure 5. Therefore after emitting two margin lines of each plot, a one square meter margin was collected for comparison and the seeds from each plot was weighed carefully with a weighing scale and therefore the functioning of the seed is calculated according to tons in each Hectar. To conduct other tests such as measuring proteins, some samples were taken randomly and transferred into the laboratory. Raw protein measurement is conducted with "Micro keldahl" instrument. Statistical measurement is conducted with SAS software. To compare averages the "LSD" test was used at the error level of 5%. To draw diagrams "EXCEL" software was used.

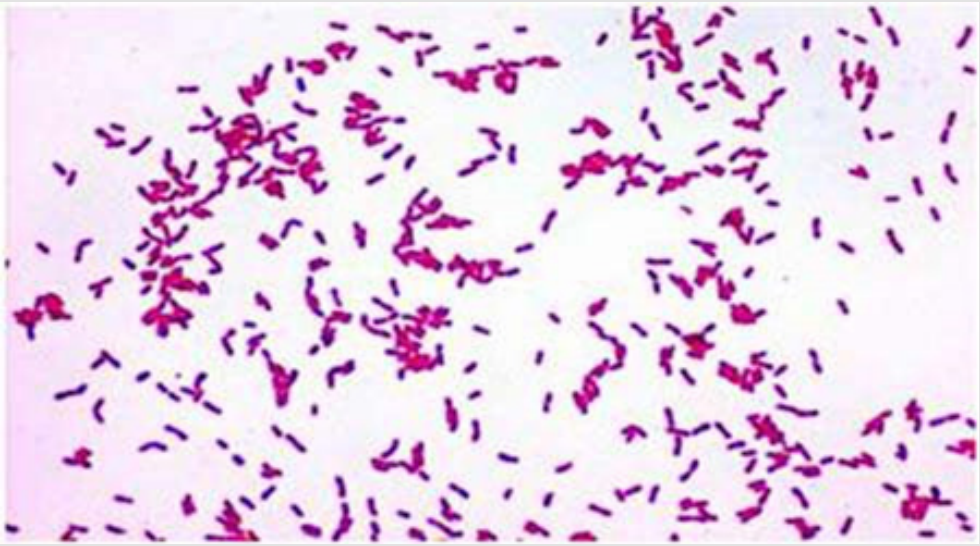

Figure 3: Image rhizobium microscopic.

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Figure 4: Rhizobium bacteria.

Figure 5: Flava beans.

Figure 6: Root nodes.

Results and Discussion

Seed's Functioning

Analysis variance result table shows the seed's functioning in nitrogen, vermi compost treatment and interaction of treatments (Nitrogen- vermi compost) (Nitrogen- Rhizobium) were significant at the level of 5%, but at the normal treatment of Rhizobium it is not significant (Table 1). Results from the average comparison according to "LSD" test show that most seeds functioning in nitrogen treatment with 65.7 kilograms in a Hectar belong to 25 kilograms treatment in a Hectar of nitrogen. In simple vermi compost treatment also the most seeds functioning is done with 67.9 kilograms in Hectar with treatment of 5 tons vermi compost in a Hector and the least seeds functioning with 60.2 kilograms in Hectar which belong to 10 Tons od compost in Hectar vermi (Table 2). (Noori, et al. [5]) mentioned that the effects of different levels of nitrogen on the functioning and functioning components of different kinds of flava beans increases with an increase in the amount of nitrogen. Vermi compost has growth enzymes and hormones and many different nutrient elements which has effect on the increase in the functioning of product (Rigi [19]). (Roesty, et al. [13]) presented the reasons for increase in the functioning by vermi compost in protection of earth nutrient elements and preventing nitrogen from being washed, biological increase in the activity and improvement in earth construction Figures 1 & 2. Results obtained (Table 3) show interaction between Nitrogen-vermi compost treatment, the most functioning of the seed is with the use of 72 kilograms in Hectar having treatment of 25 kilograms in Hectar of nitrogen and 5 Tons in Hectar of vermi compost and the least functioning belongs to 48.83 kilograms in Hector with the treatment of 37.5 kilograms in Hector of nitrogen without any vermi compost. (Mohammadi, et al. [20]) in an analysis of the effect of vermi compost and nitrogen fertilizer on the green pepper seeds mentioned that the effects of vermi compost and nitrogen fertilizers and also interaction of vermi compost and nitrogen due to the seed's functioning have significant differences at the level of probably 1%. Results obtained (Table 4) for comparison of average reaction (nitrogen- Rhizobium) show that the most seed's functioning with 67.88 kilograms in a Hectar belong to the treatment of 37.5 kilograms in a Hectar of nitrogen with the treatment of 5 Tons in a Hectar of vermi compost and without inoculation and the least functioning belong to 57.44 kilograms in a Hector with treatment of 10 Tons in a Hectar of vermi compost and without inoculation (Table 5).

Table 1: Varianceanalysis of quantitative and qualitative functioning of flavabeans under the effect of different amount of nitrogen; vermicompost and biological rhizobium legominozarom fertilizer.

Mean Squeres						
Protein	**Each 1000seedweight**	**No. of Pods in Bush**	**No. of Seeds in Pod**	**Yield**	**Degree Feredum**	**Change Resources**
3.15880741*	8505.2750^{ns}	0.75018519*	0.00934630ns	0. 1852*	2	nitrogen (a)
12.72387407*	2752.2075^{ns}	1.53240741*	0.21856852*	0.3501*	2	vermicompost (b)
0.08800741^{ns}	40002.2402*	0.13500000^{ns}	0.00240000^{ns}	0.0089^{ns}	1	rhizobium (c)
3.29548519*	15319.8595*	0.65768519*	0.04186574*	0.3391*	4	a*b
5.39814074*	1326.5868^{ns}	1.34055556*	0.18807222*	0.1898*	2	a*c
4.53347407*	7283.8124*	0.34388889*	0.01365000^{ns}	0.0844*	2	b*c
1.26487407^{ns}	38796.1204^{ns}	0.47361111^{ns}0	0.13354722 ^{ns}	0.2223^{ns}	4	a*b*c
4.4948486	6333.4883	0.13498911	0.05891558	0.0884	34	Test error
9.09	7.44	10.55	7.1	14.96	(%)	Changes coefficient

Note: ns *respectively not significant: significant at the level of 5%probability.

Table 2: comparison of average of effects of simple nitrogen; vermicompost: and rhizobium on the functioning and components of function. Numbers with similar alpha bet in each column are not significant according to test of minimum of lsd ($p<0.05$).

Protein (%)	Weight of Each 1000seeds(kg)	No. of Pods in Bush	No. of Seedin Pod	Yield(kg|hectar)	Treatments
22.9389^{a}	1045.07^{a}	3.6111^{a}	3.39111^{a}	63.444^{a}	n_1
23.2000^{a}	1074.66^{a}	3.2444^{b}	3.43389^{a}	59.389^{a}	n_2
23.7589^{a}	1087.44^{a}	3.5833^{a}	3.42611^{a}	65.722^{a}	n_3
1.51	56.67	0.2616	0.1728	6.697	LSD
23.9333^{a}	1060.44^{a}	3.4889^{b}	3.31500^{b}	60.333^{b}	v_1
23.6189^{ab}	1063.51^{a}	3.7667^{a}	3.40222^{ab}	67.944^{a}	
22.3456^{a}	1083.22^{a}	3.1833^{c}	3.53389^{a}	60.278^{b}	
1.51	56.67	0.2616	0.1728	6.697	LSD
23.3396^{a}	1041.84^{b}	3.5296^{a}	3.42370^{a}	62.444^{a}	r_0
23.2589^{a}	1096.27^{a}	3.4296^{a}	3.41037^{a}	63.259^{a}	r_1
1.173	44.02	0.2032	0.1343	5.202	LSD

Table 3: comparison of average effect of interaction of nitrogen and vermicompost on the functioning and component functioning. LSD ($P\leq0.05$) similar nos. in each column are not significant according to test min.

					Treatment	
Proteins (%)	Weight of each 1000seeds (kg)	No. of Pods in Bush	No. of seedin pod	functioning (kg/hectar	Vermicompost	Nitrogen
23.820^{ab}	1075.69^{ab}	3.9333^{a}	3.2433^{b}	68^{a}	v_1	n_1
23.633^{ab}	1065.23^{ab}	3.7000^{ab}	3.4717^{ab}	67.5^{a}	v_2	
21.363^{b}	994.28^{b}	3.2000^{cd}	3.4583^{ab}	54.833^{bc}	v_3	
23.617^{ab}	1048.45^{ab}	2.8833^{d}	3.3050^{ab}	48.833^{c}	v_1	n_2
22.812^{ab}	1043.29^{ab}	3.6000^{acd}	3.3983^{ab}	64.333^{ab}	v_2	
23.172^{ab}	1132.24^{a}	3.2500^{cdb}	3.5983^{a}	65 ^{ab}	v_3	
24.363^{a}	1057.18^{ab}	3.6500^{cad}	3.3967^{ab}	64.16^{ab}	v_1	n_3
24.412^{a}	1082.01^{ab}	4.0000^{a}	3.3367^{ab}	72^{a}	v_2	
22.502^{ab}	1123.15^{a}	3.1000^{d}	3.5450^{ab}	61^{ab}	v_3	
2.89	108.5	0.5008	0.3309	12.82	LSD	

Table 4: Average comparison of the interaction effects of nitrogen and rhizobium on the functioning and functioning components. similar nos. LSD($P\leq0.05$) in each column are not significant according to test min.

						Treatment
Protein (%)	Weight of each 1000seeds (kg)	No. of Pod in Bush	No. of Seed in Pod	Yield (kg|hec)	Rhizobium	Nitrogen
22.9322^{a}	1020.45^{b}	3.7111^{ab}	3.3511^{a}	64.111^{ab}	r_0	n_1
22.9456^{a}	1069.68^{ab}	3.5111^{cad}	3.3511^{a}	64.111^{ab}	r_1	
23.8100^{a}	1054.43^{ab}	3.0000^{d}	3.5578^{a}	55.333^{b}	r_0	n_2
22.5900^{a}	1094.89^{ab}	3.4889^{a}	3.3100^{a}	63.444^{ab}	r_1	
23.2767^{a}	1050.64^{ab}	3.8778^{a}	3.3622^{a}	67.889^{a}	r_0	n_3
24.2411^{a}	1124.25^{a}	3.2889^{cd}	3.4900^{a}	63.556^{ab}	r_1	
2.288	85.89	0.3965	0.2619	10.15	LSD	

Table 5: Average comparison of effects of interaction of vermicompost and rhizobium on the functioning and functioning components similar nos. LSD(P≤0.05) in each column are not significant according to test min.

						Treatment
Protein (%)	Weight of each 1000seeds (kg)	No. of pods in bush	No. of seeds in pod	Yield(kg|hec)	Rhizobium	Vermicompost
23.8067^{ab}	1017.66^{b}	3.6889^{a}	3.3233^{a}	61.667^{ab}	r_0	v_1
24.0600^{a}	1103.21^{a}	3.2889^{b}	3.3067^{a}	59000^{ab}	r_1	
23.2622^{ab}	1059.01^{ab}	3.7889^{a}	3.4356^{a}	68.222^{a}	r_0	v_2
23.9756^{ab}	1068.01^{ab}	3.7444^{a}	3.3689^{a}	67.667^{a}	r_1	
22.9500^{ab}	1048.85^{ab}	3.1111^{b}	3.5122^{a}	57.444^{b}	r_0	v_3
21.7411^{b}	1117.60^{a}	3.2556^{b}	3.5556^{a}	63.111^{ab}	r_1	
2.288	85.89	0.3965	0.2619	10.15	LSD	

(Bhattarai, et al. [21]). mentioned that symbiotic bacteria has effect on the growth of root and increase its amount of absorbing level of water and nutrient elements cause better growth in the aerial parts and finally the functioning of the plant. Figures 3 & 6. Use of Urea fertilizers and inoculation of seeds by Rhizobium cause increase in the amount of all characteristics compare to witness group and seed's functioning in bush increases (Poorhadian, et al. [22-24]). analyzed the effect of adding chemical fertilizers on the process of stability of nitrogen molecules in Soya Beans plant and obtained the result that chemical fertilizers decrease the processes of stability of the plant rapidly and hardly causes increase in the functioning.

Number of Seeds in a Pod

Results from the table of variance analysis show the number of seeds in a pod with treatment of vermi compost and reaction of (nitrogen-vermi compost) (Nitrogen- Rhizobium) is significant at the level of 5%, but it is not significant with the treatment of Nitrogen and Rhizobium and reaction of (vermi compost –Rhizobium) (Table 1). Results from the average comparison according to "LSD" test show that the most of seeds in a pod is with the treatment of vermi compost with 10 Tons in a Hectar vermi compost and the least number of seeds in a pod is belonging to treatment without vermi compost (Table 2). Increase in vermi compost from 0 to 10 Tons in a Hectar causes increase in the number of seeds in a pod. (Khoshnood, et al. [12]) in their research mentioned that the effect of vermi compost on the number of seeds in a pod is significant at the level of 1%. In (Nitrogen-Vermi compost) treatment reaction belong to the most seeds in a pod with the treatment of 37.5 kilograms in a Hectar of Nitrogen without vermi compost and the least number of seeds in a pod belong to 50 kilograms treatment of Nitrogen in a Hectar without vermi compost (Table 2). In the interaction treatments (Nitrogen- Rhizobium) the most number of seeds in a pod belong to the treatments of 37.5 kilogram of nitrogen in a pod and inoculated seed (Table 2). Inoculation has no effect on the number of seeds in a pod. Number of seeds in a pod is mainly being effected with the genetic construction and these characteristics is among the most stable functioning of the components of beans, since the number of cellules eggs in all ovaries are equal. Nitrogen mainly cause production of Biomass, increase the amount of photosynthesis in plants and therefore the plants will be able to protect more seeds in a pod (Kenndy [25]).

Number of Pods in A Bush

Variance analysis table show that the number of pods in a bush with the Nitrogen- vermi compost treatment and in interaction (Nitrogen-vermi compost) (Nitrogen-Rhizobium) (vermi compost-rhizobium) at the level of 5% is significant, but with the Rhizobium treatment it is not significant (Table 1). Average of comparison results show that the most pods in a bush belong to nitrogen treatments of 50 kilograms nitrogen in a Hectar and the least number of 37.5 kilograms nitrogen in a Hectar (Table 3). (Glabi & Lack 2014) mentioned that with increase in the amount of nitrogen use, the number of pods in a bush in Flava beans increases significantly. Also in treatment of vermi compost the most number of pods in a bush are in 5 Tons in a Hector of vermi compost and the least number of pods are in a bush belong to 10 Tons in a Hectar of vermi compost (Table 2). (Khoshnood, et al. [12]) in a report regarding their analysis of different amounts of vermi compost on the number of pods in a bush of lentils mentioned that this effect is significant at the level of 5%. In another interaction (Nitrogen-Vermi compost) the most number of pods in a bush belonged to the treatment of 25 kilogram in a Hectar of nitrogen and 5 Tons of vermi compost in a Hector and the least number of pods in a bush belong to 37.5 kilograms of Nitrogen in a Hectar without any vermi compost (Table 3). In an interaction of (Nitrogen-Rhizobium) the most number of pods in a bush belong to treatment of 5 Tons in a Hectar of Vermi compost and without inoculation and the least pods in a bush belong to the treatment of 10 Tons of vermi compost in a Hectar and without any inoculation (Table 5). (Ghasemzadeganjaei, et al. [18]) in analysis of the effect of inoculation of seeds with bacteria on the bean's components functioning found out that inoculation cause significant increase on the number of pods in soybean bush. The number of pods in a bush is the most variables characteristic in components functioning.

Weight of One Thousand Seeds

Table of variance analysis show that the weight of each thousand seeds are significant in treatment of Rhizobium and interaction of "Nitrogen-Vermi compost" and also interaction of "Nitrogen -rhizobium" (Table 1) at the level of 5%, but in treatment with Nitrogen- Vermi compost and interaction of "Nitrogen- Rhizobium" it is not significant. Results of the average comparison shows that the most and the least weight of each thousand seeds which are treated with Rhizobium treatments with 1096.2 and 1041.8 belong to inoculation and without inoculation respectably (Table 2) and weight of each thousand seeds inoculated is being increased. In an interaction of "Nitrogen-Vermi compost" the most weight of thousand seeds with 1132.24 belong to treatments with 37.5 kilograms of Nitrogen in each Hectar and 10 Tons of Vermi compost in each Hectar (Table 3) and the least weight of every thousand seeds is equal to 994.2 with the treatment of 50 kilograms of nitrogen in each Hectar and 10 Tons of Vermi compost (Table 3). Increasing the amount of Vermi compost causes increase in the weight of thousand seeds. In interaction of "Vermi compost - Rhizobium" the most weight of every thousand seeds is 1117.60 with the treatment of 10 Tons of Vermi compost and inoculated seed and the least weight of every thousand seeds is 1017.66 which belong to treatment without Vermi compost and without inoculation (Table 5). In a research by (Singh, et al. [26-28]) which were conducted in field they noticed that application of 10 Tons of Vermi compost in comparison with non- application of Vermi compost, caused noticeable increase in the weight of each thousand seeds of Barley plant. They mentioned that use of Vermi compost cause incitement of functioning of microorganisms useful for soil and produces mineral elements continuously and stably especially Nitrogen and therefore cause increase in the components functioning and seeds. (Jashankar, et al. [29]). mentioned the reason for positive effect of Vermi compost on the weight of each thousand seeds as the availability of useful aerobic microorganism. They also mentioned that PIT material which have porous, air supplying, drainage and high capacity of water preserving and can preserve food stuff at a high capacity are considered as the advantages of Vermi compost. (Nanjappa, et al. [30]) reported the positive effect of Vermi compost on thousand seeds weight.

Protein

Variance analysis table show that the protein in seeds treated with Vermi compost and the interaction effect of treatments of "Nitrogen- Vermi compost" "Nitrogen- Rhizobium" "Vermi compost- Rhizobium" is significant at the level of 5%, but it is not significant at treatment of simple Rhizobium (Table 1). Comparison of results averages show that the most percentage of protein in seeds are in treatment with Nitrogen with 23.75 with treatment of 25 kilograms nitrogen in a Hectar and the least percentage is in protein with 22.93 with the treatment of 50 kilograms of nitrogen in a Hectar. In excess use of fertilizers, most of the nitrogen used is gathered instead of Amino Acids or proteins in the form of nitrogen ions (Emamy, et al. [31-33]). Also in treatment with vermi compost the most percentages of seeds' protein with 33.93 belong to treatment with vermi compost and the least percentage of seeds' protein with 22.34 belong to 10 Hectar of Vermi compost in a Hector (Table 2). With decrease in the amount of vermi compost, the amount of protein increases. In an interacting effect of " Nitrogen-Vermi compost" the most percentage of protein with 24.41 belong to treatment with 25 kilograms of nitrogen in a Hectar and 5 Tons of vermi compost in a Hectar and the least percentage of protein belong to seeds with 21.36 with treatment of 50 kilograms nitrogen in a Hectar and 10 Tons of vermi compost (Table 3). In interacting effect "Nitrogen-Rhizobium) the most protein percentage of seed with24.24 belong to treatment with 25 kilograms of nitrogen in a Hectar of inoculated seeds and the least percentage of seeds' protein with 22.59 belong to treatment of 37.5 kilograms of nitrogen in a Hectar and inoculated seeds (Table 4). (Khoshnood, et al. [12]) analyzed different amounts of vermi compost on the seeds' protein and lentil straw and obtained the result that vermi compost has no significant effect on the percentage of seed's protein. The most percentage of seed's protein belong to the use of 20 tons of vermi compost bio-fertilizer in a Hectar with an average of 24.27 percent of seed and the least of average belong to witness with 23.27percent of protein of seed which they believe the reason for it is because more percentage of nitrogen belong to the seeds with the use vermi compost and Urea fertilizer compare to their application alone, that cause increase in the density of seed which is because of high correlation of nitrogen percentage of seed and seed's protein's density. Analysis of the effects of strains of Rhizobium and use of nitrogen in the functioning and protein of haricot beans show that is inoculation is conducted on strained active bacteria, it causes stability in the nitrogen in haricot beans without using any nitrogen fertilizer (only use of 15 kilograms urea in a Hectar as Starter) can obtain the maximum functioning and percentage of protein (Hemati, et al. [16]). (Ghasemzadeh Ganjeie, et al. [18]) mentioned that with the use of inoculating material, not only the use of Nitrogen fertilizer can be avoided, but also more and richer products can be obtained which is due to different effects of inoculating material and higher protein production and this is while avoiding the contamination of biological environment and no more expenses for nitrogen is needed. In interacting effect of "vermi compost-Rhizobium" the most percentage of seed's protein with 24.06 belong to treatments without vermi compost and inoculated seeds and the least percentage of protein with 21.74 belong to treatments of 10 Tons of vermi compost in a Hector and inoculated seeds (Table 5).

Conclusion

Results of the test show that nitrogen chemical fertilizer in the seeds functioning characteristics, no. of pods in a bush and protein is significant, but in the number of seeds in a pod and weight of 1000 seeds it is not significant and vermi compost bio-fertilizer is significant in the seed functioning characteristics, number of seeds in a

pod, number of pods in a bush and protein, but it is not significant in weight of each 1000 seeds , on one hand Rhizobium is only significant in each 1000 seeds and in the other conditions it is meaningless. And also the interaction effect of "nitrogen-vermi compost" is significant in all characteristics and also the effect of "Nitrogen-rhizobium" is significant seed's functioning, No. of seeds in a pod, No. of pods in a bush and protein, but it is not significant in the weight of thousand seeds. On the other hand the interaction effect of "vermi compost-rhizobium) is significant in all characteristics except in the number of seeds in a pod. Use of 5 tons of vermi compost in a Hectar and 25 kilograms of pure nitrogen in a Hectar without inoculation of seeds with rhizobium bacteria is generally considered as the best treatment which causes saving of up to 50% of the nitrogen chemical fertilizer which is important in biological and economical condition.

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Conflict of Interest

All authors declare that there is no conflict of interest in this work.

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