Evaluation of horse bean production components

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Abstract: this study was performed in the Research Station, Islamic Azad University of Ahvaz fact Southern city of Ahvaz in the geographic profile: latitude: '20 º 31 Longitude: '40 º 48 Altitude: 18 m and average rainfall: 256 mm in 2006 year. Research projects using the project once chopped plots in a randomized complete block design with treatments main bean varieties: four cultivar horse bean (*Vicia Faba*L.) plant: BARAKAT, ZOHRE, SHAMI and JAZAYERI and sub-levels of nitrogen fertilizer treatments three levels of nitrogen fertilizer (N1, N2 and N3 treatments, respectively 20 and 40 and 80 kg fertilizer N ha) were performed. A BARAKAT variety with highest yield was 4880 kg ha. Among the cultivar, the BARAKAT & JAZAYERI with the amount of dry matter 8209.06 and 8201.01 kg ha from a higher level than other cultivars, respectively. Process of dry matter accumulation in cultivar BARAKAT and T 80 = N3 kg per hectare were higher in treatments 20 = N1 and 40 = N2 kg ha of nitrogen fertilizer at 1% level with a time difference did not check growth parameters indicate superior varieties BARAKAT on the other cultivar in indicators of total dry matter, crop growth rate and leaf area index is. High yield in the treatments 80 = N3 and 40 = N2 probably due to supply fertilizer base required for plant growth in early stages yet stabilized biological nitrogen begin has not plants need nitrogen fertilizer have to be able to level green field increases and photosynthesis do more are to be. This higher amount of leaf area index of this treatment with a mean 3.7 which leads to higher dry matter accumulation was visible in the cause of dry matter allocation to seeds is more.
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1. Introduction

Structure yield in legumes

Grain yield components as follows:

$$U = \frac{K.L.Z.A}{10^5}$$

***U** -yield (ton/ha)*
***K**- Number of plants*
***L**- Average number of pods per plant*
***Z**- Average number of seeds per pod*
***A**- Grain weight (g)*

To obtain a more precise, it is necessary, the amount of waste resulting from decreased harvest (6 to 10 percent or more.) Values of k, L and z can be measured as well as observation.
Number of plants per square meter in different parts of the vegetation should be evaluated. (In compare was with the cereals). Non-uniformity also is considered. Plants should be 4 to 8 adjacent rows and rows of about a meter long were counted. During part of rows evaluated using the following formula may be calculated:

$$d = \frac{1}{n.a}$$

***d**- Destination in which the evaluation*
***n**- Number of rows*
a- *rows wide (m)*

1. *The average number of pods per plant*

In different locations should be evaluated within the vegetation, must be the minimum number of 30 to 50 plants, the pods should be on neighboring plants and on the main axis and branches are counted together.

2. *The average number of seeds per pod*,

The proper evaluation component of yield, pods plant a seed to be harvested and then be counted. Upper plant seed pods usually number less.

3. *Seed weight*

Such as seeds and reach non-uniform moisture content are different. This component is usually specific for each species and cultivar with regard to conditions prevailing during the investigation and consideration of other adverse factors that have adverse effects on the characteristics of the common value can be estimated.

Under very adverse conditions, grain weight probably 20 to 25 percent less than the average figure to the desired decrease. Determining grain weight using the following formula is calculated:

$$A = \frac{Ay(100 - V)}{100 - V_S}$$

***A**- Thousand grain weight.*
***Ay**- Grain weight (7 percent moisture)*
***V**- Actual moisture content of seeds.*
***V_s** - Seed moisture content is standardized.*

Seed weight with grain moisture content below 40 percent to almost fully mature stage remains constant. Since determining yield through yield components is almost complex, the possibility of using a more simple way exists. This method, based on average grain weight of standard (25%, 50% or one square meter) based on seed moisture content is determined. Predicted yield calculated from the formula:

$$U = \frac{p \times (100 - V)}{(100 - V_s) \times 100}$$

***U** -yield (ton/ha)*
***P**- Seed weight in one square meter.*
***V**- Seed moisture content, percent.*
***V_s** - Standard seed moisture content*

The correct way to decide how to use the complete coating of some vegetation (mainly beans) which has a weak classification sheath helps. If the prediction is low yield, the better the forage plants are allocated.

2. Material and Method

In this study, the Research Station -Research, Islamic Azad University of Ahvaz fact

Southern city of Ahvaz in the geographic profile: latitude: '20 º 31 Longitude: '40 º 48 Altitude: 18 m and average rainfall: 256 mm was in 2006 .

Research projects using design plots once chopped the block ¬ randomized complete with treated major cultivar Bean and treatment sub-levels of nitrogen fertilizer was performed in the treatment main cultivars plant beans (V1=BARAKAT, V2=ZOHREH, V3=SHAME and cultivar V4=JAZAYERI) and secondary treatment levels of nitrogen fertilizer (2 = N1, 40 = N2, and 80 = N3) kg ha were studied in mid-November planting date for two years was conducted. Before this date, including plowing and land preparation operations and drive me yours do calcium phosphate and fertilizer to the land was then based on the experimental plots map classification was done in the field and 24 plots in each square meter of bed by 10 lines were cultured and treated according to the amount of nitrogen fertilizer to test strip was added to the stack. During the test two to three times weeding grass weeds for disposal was done .

3. Result

A - Review of functional components

Growth parameters

ANOVA table of results shows that the trend bean varieties total plant dry matter accumulation and different levels of nitrogen fertilizer treatments at 1% significant having been so matter accumulation with increasing N fertilizer - the total dry plant increased This is due to increased leaf area and photosynthesis in line with the increase in plant dry matter accumulation is (9).

Among the cultivar, the BARAKAT & JAZAYERI with the amount of dry matter 8209.06 and 8201.01 kg ha from a higher level than other cultivars, respectively (Table 1).

But the different levels of nitrogen fertilizer treatments 80 = N3 kg per hectare in terms of higher average dry matter accumulation and treatments have been 20 = N1 and 40 = N2 kg ha of nitrogen fertilizer at 1% with no difference lower dry matter accumulation than treatments 80 = N3 kg ha of nitrogen fertilizer showed (Table1).

Table1. Evaluation of horse bean production components

Yield(Kg/hac)	TDW(Kg/hac)	Treatment
4880 a	**8209/06 a***	**V_1**
4200 b	**6998/81 b**	**V_2**
3998 c	**6896/21 b**	**V_3**
4236 b	**8201/01 a**	**V_4**
4875 b	**8049/62 b**	**N_1**
5114 a	**8051/09 b**	**N_2**
5120 a	**8960/60 a**	**N_3**

****: Average each experimental factor in each column at least one common letter are not statistically different according to Duncan test at 5 percent level be.***

Sinha (1998) declared the process of dry matter accumulation bean varieties depends on two important parameters which are: leaf area index and leaf area duration and the period to digit growth during his slow and more rapid enter a period of rapid growth be more leaf area duration can offer. Results in higher dry matter accumulation of figure gets BARAKAT with the variety of this is completely true. LAI chart bean varieties from a sigmoid curve indicated that it's in elementary period of growth, that trend has slowly until 50 days after planting, leaf area index value of only the numeric value 0.7 is taken to this trend LAI to develop legume family is a special, high levels of applied nitrogen fertilizer (80 kg per ha), first period to reduce leaf area was expanded, and secondly in the treatment LAI value of treatments which lower levels of nitrogen were applied more so were reduced to 44 and 49 percent respectively LAI values at levels 40 and 20 kg ha treatments than in the early stages of growth were observed.

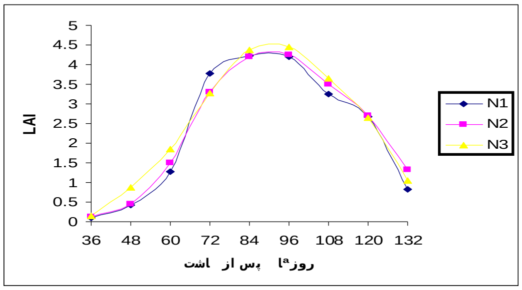

Fig1. Different amounts of nitrogen fertilizer on LAI

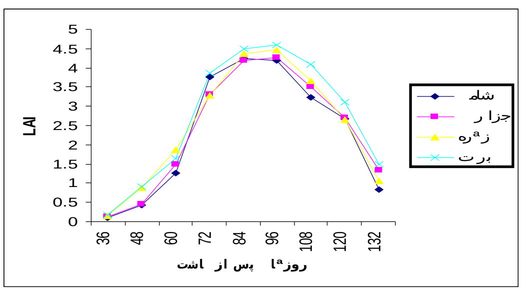

Fig2. Amounts of nitrogen fertilizer on cultivated varieties LAI

But over the early stages of growth and the start biological nitrogen fixation, leaf area index less nitrogen fertilizer treatments which had received approximately parallel to the LAI received more fertilizer treatments had expanded, so biological nitrogen fixation somewhat in terms of the plant need nitrogen fertilizer on the leaves and the growth has caused. Among the cultivars studied process of expanding leaf area index figure was more BARAKAT than other varieties, this variety of courses to and early growth in 43 days to complete, and delivered them into their rapid growth period was the, numerical maximum level indicator BARAKAT with a mean leaf number four quarters was to varieties JAZAYERI, ZOHRE and SHAME respectively maximum LAI at flowering time allocated .

With the number of nodes during flowering varieties were observed when the LAI their peak reached in the bean varieties, the number of nodules on roots showed a significant decrease .

Summer Field (1996) announced during the flowering plants because of their high metabolism and high energy expenditure for flowering, carbohydrate allocation to roots in high doses that it is used to cut nodes will result in symbiotic Rizobium bacteria and plant disorders and nodes are not due to arrive on the carbohydrates of plant roots are starting to fall, this phenomenon during the flowering peak LAI was clearly observed in the tested varieties. High levels of nitrogen fertilizer to increase and expand the base of leaf area index were at an early stage and growth period may reduce LAI and faster plant growth phase of LAI is rapid. CGR indicator of production efficiency in the production of ground vegetation is the live weight, i.e. an indicator of the ability of agricultural production that Watson presented the calculated data. However, only plants that together, in a package of crop covers or natural communities grows used to.

B. Crop growth rate (CGR)

Indicator of production efficiency in the production of ground vegetation is live weight, CGR index of agricultural production capacity is calculated and Watson it has provided. Only plants that together, in a package of crop covers or natural communities grow used to.

Studying the trend of values and crop growth rate in the different treatments applied in this trial was concluded the following :

1- ***N fertilizer in the early stages of the growth increased crop growth rate and the slope was the early stages of growth (48 days after planting) was fast and soon entered a period of rapid ¬ crop growth rate, which was due to high LWR and leaf area index in this time period, because crop growth rate (CGR) is obtained by multiplying these two parameters .***

2- ***maximum crop growth rate(CGR) in N31V treated with 22.5 g m a day were almost within 96-72 days after planting when the maximum crop growth rate and this will keep one of the main reasons increased grain yield in this treatment that the topic of grain will be discussed .***

3- N2V3 applied treatment with a maximum crop growth rate at 96 days after planting was obtained (19 g square meter per day) and durable product growth rate of the time interval 96-84 days after planting was obtained. Biological nitrogen fixation process of changes in crop growth rate somewhat different levels of nitrogen has similar with shortages because of high levels of nitrogen with nitrogen managed somehow to equality, but equality in the early stages of growth is seen after getting into a period of rapid growth and the anthesis differences in crop growth rate trend is observed .

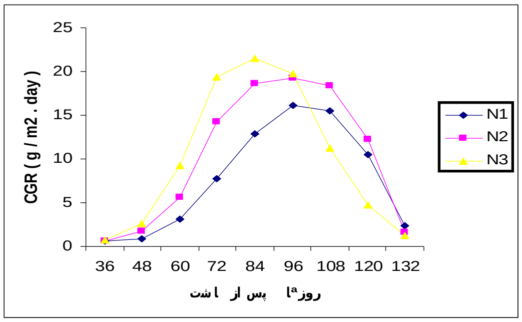

Fig3. Effect of different levels of nitrogen fertilizer on trend CGR $(g/m^2.day)$

B. Yield

ANOVA table of significant treatments by applying different amounts of nitrogen fertilizer and bean varieties and their interactions on yield showed.

Duncan test showed that among the cultivated varieties, varieties with the BARAKAT of the highest yield was 4880 kg ha grain yield than other varieties less demonstrated. Duncan test showed that different amounts of nitrogen fertilizer, causing changes in grain yield and fertilizer treatments were 80 = N3 and 40 = N2 had the highest average yield.

High yield in the treatments 80 = N3 and 40 = N2 probably due to supply fertilizer base required for plant growth in early stages yet stabilized biological nitrogen begin has not plants need nitrogen fertilizer have to be able to level green field increases and photosynthesis do more are to be. This higher amount of leaf area index of this treatment with a mean 3.7 which Chart 3-4: Effect of different amounts of nitrogen fertilizer on TDW leads to higher dry matter accumulation was visible in the cause of dry matter allocation to seeds is more. Increased dry matter accumulation in the treatments in line with the high value crop growth rate of these two treatments as the average 19-18 g m is the day that treatment was higher than N1. But the treatment 20 kg ha-N1 Nitrogen fertilizer supply base was not cause the plant and consequently growth and leaf area index has risen slowly, so some of the plant growth period over the farm has no full coverage that reduced dry matter accumulation process and ultimately reduce yield although it has treated approximately 30 days after the biological fixation of nitrogen was started and partly on the plants but the amount of fertilizer is the primary means 20 kg ha as the base is low .

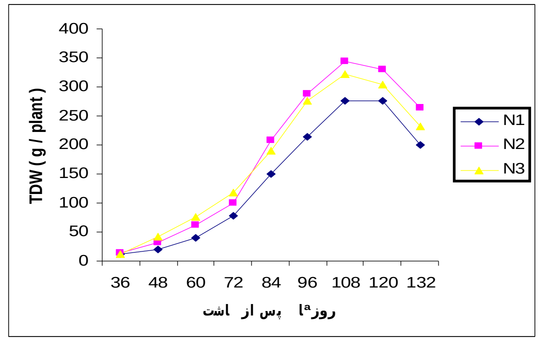

Fig4. Effect of different amounts of nitrogen fertilizer on TDW

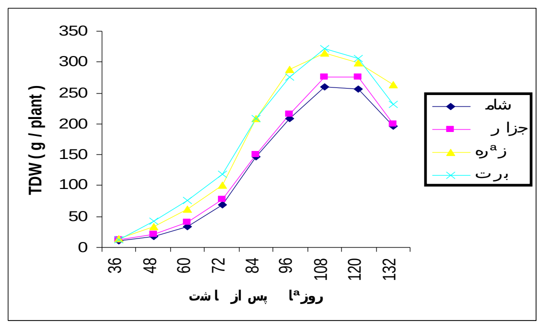

Fig5. Effect of amount of nitrogen fertilizer on cultivated varieties of TDW

4. Discussion

Among the varieties cultivated varieties BARAKAT with the highest yield was 4880 kg per hectare yield and other cultivar far lower than demonstrated. Similarly, different amounts of fertilizer nitrogen causes changes in grain yield were and treatments 80 and 40 kg ha, the highest average yield had, although accumulation of nitrogen in plant fertilizer treatments 80 kg ha highest accumulation of nitrogen in the plant showed that This high potential of the bean plant uptake of this element specifies that the increased vegetative growth and the emergence of a greater number of side branches that eventually became the plant grain yield increase. Digit growth parameters indicate superiority over other varieties BARAKAT of LAI, total dry matter and crop growth rate can be BARAKAT with a total consumption figure 40 kg ha nitrogen fertilizer is recommended - should be .

Duncan test showed that among the varieties cultivated varieties BARAKAT with the highest yield obtained with 4880 kg per hectare and other varieties yield much less demonstrated. Duncan test showed that different amounts of nitrogen fertilizer, causing changes in grain yield and fertilizer treatments were 80, 40 had the highest average yield

With the number of branches per plant FabaL correlation coefficient (0.69 = R^2) was calculated and a direct positive regression (but not too high) of it's offered. Applying more fertilizer N_3 in tests to increase the number of branches found significant spatial yield was increased. Among the figures of the number of digits Blessing had more branches that this figure will increase performance.

Applied nitrogen fertilizer in the early stages of growth has increased and the slope CGR early growth (48 days after planting) was sharp and rapid phase earlier that CGR has been high due to NAR and LAI in this period, because CGR is obtained by multiplying these two parameters. Maximum CGR treatment with 22.5 m g per day is achieved in approximately 72-96 days interval after planting around the maximum amount, CGR, and retains one of the main reasons for increased yield this is seed treatment.

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