Evaluation of changes the qualitative & quantitative yield of horse bean (*Vicia FabaL*) plants in the levels of humic acid fertilizer

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Abstract :Much of the farmland in IRAN was consisting of soils arid and semi-dry, which of organic matter are also poor. Organic compounds used in these areas can improve the physical properties, chemical, and soil fertility, In this regard, this test was performed in 2010 year; design was used split plot randomized complete block with 3 replications. Main plots, cultivars with 3 levels: BAREKAT (V_1), JAZAYERI (V_2) and the SHAMI (V_3) and sub-plots, treated with acid Humic 4 levels including: controls (F_0), acid humic (F_1), humic acid +macro- elements (F_2) and humic acid + micro-elements (F_3) were considered. Acid composition of micro and macro elements humic in the prolonged stages of bean growth was caused increase the number of seeds per pod, seed yield, harvest index, grain protein percentage. Among the traits related to yield, most yield-related biological treatment (V_3F_2) with a numeric value and the highest grain yield 6233 kg ha treatment (V_3F_2) 2,942 kg per hectare with the average number of seeds won.

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Introduction

Clate Humic producing acid from various nutrients such as sodium, potassium, magnesium, zinc, calcium, iron, copper, and Humic acid solution used in the food category growth, and nitrogen content in the aerial roots (and not your Nvpamvr, 1979) and the disappearance of chlorosis in corn leaves (Fernandez, 1968) and was Lupine (Santiago et al, 2008).In a three-year study of three amounts of phosphorus acid with and without Humic it looked on the growth of potatoes. The results showed that the phosphorus content of leaflets on treatments with acid Humic 03 . 0% increase. Treated with acid to humic tuber yield more than 10 times increase in 2 to 3 years of study. The results showed that treatment with acid humic tumor had no significant effect on density.

The researchers used the acid levels in the soil Humic the spraying and application of quantitative and qualitative yield of the pepper. The results showed that acid humic significant effect on chlorophyll content of leaves, especially on a chlorophyll b. The experimental spray Humic acid 200 mg per liter, an increase of 38 percent, 74 percent of the plant to absorb nitrogen and phosphorus uptake of barley was 72% (Yvsv et al, 1996) and Khazaei Sabzevari (2009) Effect of spraying acid levels Humic (0, 100, 200 and 300 milligrams per liter) at four different times (tillering, stem elongation, flag leaf emergence and pollination) on growth and yield characteristics were investigated. The results showed that acid humic dry weight, leaf area, stem height was a significant effect. Turkmen et al (2004) showed that tomato plants grown in quantities of 1000 mg .kg humic acid soil increased tomato yield was increased.

Avayd and Chen (1990) showed that acid Fvlvyk Humic acid in concentrations of 25 to 300 milligrams per liter in the nutrient solution is able to stimulate the growth of stem plants. In the pilot stage of development in wheat spikes Humic spray materials in high winds and hot dry conditions, yield 7 to 8 percent increase compared to the control treatment (Zvdan, 1986). 8 to 20 percent yield increase in the use of acid Humic, 14 percent rice and 44% in the radishes (and Meyer, 1998). In terms of greenhouse effect, acid Humic on oat growth were investigated. The results showed that application of Humic acid 100 mg per pot had a significant effect on dry matter yield.

Karakart and colleagues (2008) 5 Humic acid concentration on yield and fruit quality in pepper leaf and soil treatments were studied. Treatments were applied at the beginning of the fourth week after planting. Humic significant effect on acid stability, length and diameter did fruit. The use of acid fruits with low sugar levels through both increased Humic. Humic acid also have significantly effective in leaf chlorophyll content and its effect on the content of chlorophyll in the leaves. Humic acid in 20 mL quantities of water, a spray of dirt and leaves the

chlorophyll content was highest. Humic acid also significantly increased compared to the total weight of fruit.

Soil health is one of the key factors in determining the yield of crops.20 kg ha Humic acid with 100% NPK, plus a 12% increase in the uptake of onions in the highest yield and lowest yield of NPK with control (0 Humic acid and 0 NPK) was.To NPK, respectively, to 105 3 . 199, 9 . 7 to 63.12 and 132 to 139 mg per kg of soil during the experiment by adding acid and fertilizer increased Humic.

The researchers tested three types of acid Humic (uptake, k-Humate, Eko-Fer) on the yield and characteristics such as weight, amount of permeability, PHP, color, and ascorbic acid in tomato fruit and stem thickness were investigated. The results showed that most of the fruit, the flowers and fruit weight (3 . 67 g) using 600 cc . da Eko-Fer Humic acid were obtained. Most of the gum and the highest ascorbic acid was about 5 . 25 mg per 100 g fruit acid used cc.100 300 Humic Uptake and maximum stem thickness (685.10 mm) using the 500 cc.100 Acid Uptake Humic income (safeguards and Akal, 1999.(

Martin (1967) found that the use of derivatives Humic acid in tomatoes grown in pots, especially in the final stages of the yield increased significantly. Humic treated with acid to increase in number of fruit to fruit size, especially in the first harvest was five. I went to see the high quality fruit. Humic acid application also increased 200 percent in the first harvest was in tomatoes.

Branl and colleagues (1987) in a field trial of the combination of oxidized Humicy extracted from tomatoes, cotton and grape were investigated. As a soil treatment at the beginning of another growing season and were applied as a spray in mid-growth period.

Duvall (1998) during the testing of various amounts of up to 400 pounds on two species of rapeseed (Brassica rapa L.) and (Brassica hirta L.) with three different cultures on one-year period studied. The study found no difference in plant growth parameters.the fourth week of rain on the second planting eliminates the increased survival of plants.

The test of spraying acid and nitrogen Humic on durum wheat was investigated. Results showed a significant increase in acid Humic shoot and root dry weight in wheat. Humic acid also increased photosynthetic activity of plant enzyme activity was increased (Dlfayn et al, 2005). Johns et al (2004) the acid test Humic on spring wheat yield were investigated. The results showed that humic acid phosphorus and other nutrients to increase and the increase in yield was significant.

Salmn and colleagues (2005) in a field trial of the three hybrids of watermelon contains acid Humic Sugar belle, Aswan, Gizal looked. Humic acid to drip irrigation in the values of zero (control), 2.4 and 6 liters of the Fdan and fruit yield and quality were investigated. The results showed that the hybrid had the lowest yield Sugar belle largest and Aswan. Humic acid concentrations on 6 liters significantly increased the yield of 3 hybrids.

Seeds were evaluated. The results showed that seed number, plant height and spike traits that were most responsive to acid Humic. The late planting dates (stress), Hybrid 18F average yield was lower than optimal conditions (Yvlvkan, 2008).Humic acid and positive direct effects on crop growth (Linnaeus Vagan and Han, 2004), peas (Vagan, 1974) and chicory (Valdryty et al, 1996) found. Treated was with acid in plant growth response curve showed that increasing the concentration of acid Humic Humic increased plant growth. The reduction in growth was seen in very high concentrations (Chen and Avayd, 1990)., 1986. Infrequently reported and Associates, 1988. Avayd and Chen, 1990. Moscow et al, 1999 and Noble, 2002.(

1. Material and Method

Land preparation and planting procedures

In order to run tests on the grounds of the 7.25.88 irrigation, plowing to a depth of 20 cm, 15 cm and depth of the disk was trowel. Urea nitrogen of 30 kg of pure nitrogen per hectare as basal fertilizer was applied at planting. After preparation, the size plot of land was design on the map, the dimensions of a test plot were 6 × 4 m and 6 m in length planted in each plot was 7 lines. Between two rows of 60 cm and 15 cm between rows of seeds were on. The manual method was performed on 08.03.89.

The final performance of the final harvest

The number of plants per unit area and yield components of four components, namely the number of nodes contained in the plant, pod, pods, seed number per pod and average seed weight is the significance of the number of pods per plant and average seed weight in order to function as important components.

At the end of the growing season of lines 3 and 4 as the final area of one square meter were the yield and its parameters (number of pods per plant, average seed number per pod, seed weight) were measured. This test was used in the following formula:

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

K: number of plants per square meter
L: average number of pods per plant
Z: The average number of seeds per pod
A: thousand seed weight (g)

Statistical computing

Analysis of variance, split plot design with the computer software EXCELL, MSTATC bonds was to compare the attributes of the LSD test was used.

2. Result

2.1.1. Qualitative and quantitative components of the production

2.1.1.1. Yield

A result of the variance shows that the number of humic acid and their interactions in the 1% level has significant effect on yield. The number of treatments on grain yield at 5% level is significant.

Comparisons with the average highest and lowest yield of the macro humic acid treatment and the lowest value in 2765 to control with the numeric value are 2,122 kg per hectare. High yield in positive physiological effects of the macro humic acid treatment effects on plant cell metabolism that plants can increase yield (and infrequently reported, 2002). Alqmry and colleagues (2009) the effect of acid on plant Humic Bean said Humic acid increases the yield and yield components. In a study of spray Humic cluster development stage of wheat, yield 7 to 8 percent increase compared to the control treatment (Zvdan, 1986). Humic acid used in wheat, rice, radish, respectively, 20 and 14 and a 44% increase in yield (and Meyer, 1998).

Based on the comparisons yield the highest average number of islands with the lowest value in 2514 and 2412 the average amount allocated to it is a blessing. Higher performance in a number of islands can be most affected by the number of pods per plant and number of fertilizers, he said.

In examining the interaction of different varieties of acid Humic and comparisons with the highest average performance compared to the macro Humic SHAMI and acid value of 2942 kg per hectare and the lowest figure of the blessing and acid Humic macro with value 1733 kg hectares respectively.

2.1.2. Yield components

2.1.2.1. The number of pods per plant

Due to the variance and number of treatments and their interactions on acid Humic pods on the plant is significant at 5% level. Comparison tests for the effects of acid on the number of pods per plant showed Humic highest number of pods plant to acid treatment Humic macro with the number of pods per plant and the minimum value 20.11 in value with the control pod number 19.14 plant is achieved.. Macro Humic acid prevents loss due to the elements essential to plant flowers that will have enhanced performance. The loss in grain yield of flowers is one of the limiting factors.

Mean table comparisons, the highest and lowest number of pods per plant in treated compared to the number of islands with a numeric value associated with 17.19 and 12.16 the number of pods per plant varieties have been blessed with a numeric value.

The study compared the results for the interaction of acid Humic and more pods per plant varieties and cultivars to acid Humic macro SHAMI with 63.21 and the lowest value of the macro and the amount of acid Humic blessed with the value 2.13 the number of pods in the plant.

Among yield components, number of pods per plant, one of the most important yield components and grain yield than is. Ability of the flowers and pods of beans in the actual production potential is high, but this depends on the genetic makeup and environmental conditions are perfect, and because changes in the yield is very high.

2.1.2.2. The number of seeds per pod

Results of the variance at 1% level indicating that the effects of acid treatments and their interactions humic figure on the number of seeds per pod were significant. The comparisons in Table (2-4) treated with acid Humic highest average acid value of 5.02 seeds per pod and the lowest value in the two quarters is the number of seeds per pod. However, seeds per pod and the number of acid and acid Humic Micro Humic no significant difference.

Comparisons in the average number of treatments to the highest and lowest average value in order to figure blessed with 5.09, and SHAMI with the figure number 93. 4 is the number of seeds per pod. Examining the interaction between the largest number of seeds per pod and number of acid

Humic SHAMI were with the value 5.53 the number of seeds and the lowest number of islands and micro humic acid value of 4.07. Unlike the number of pods per plant, one of the variable component is the number of seeds per pod, grain yield, grain yield is the most constant, because the number of oocytes in the ovaries is almost equal.. The number of seeds per pod and its changes, the effect of fluctuations is not the same as the number of pods. During elongation of seed per pod and seed filling also effective

Harvest index

Harvest index of grain yield to biological function can be divided. Harvest index is the distribution coefficient assimilates and that part of what made assimilate the tank has been transferred. Results showed that 1% of the variance in the number humic acid and their interactions were significant. Comparison tests showed that the treatment of various acids Humic highest and lowest average harvest index, respectively related to the treatment and control of macro Humic acid value was 77.46 and 08.42.

The test compares the average invoice amount for the highest and the lowest harvest index to the figures islands blessed with a numerical average of 63.45 and 09.45 shows.

In reviewing the test results compared to the number of factors and interactions of acid and acid Humic SHAMI Humic highest harvest index compared to the minimum number of macro and micro Humic islands and is acid.

Although the number of islands has a lot of grain, but many of its biological function, provided that the division of these two numbers are low harvest index. But the figure has blessing to yield fewer but much less allocated to dry matter accumulation. this result with two more harvest index is provided. This phenomenon should be studied in a number of islands, which accounts for the biological function of dry matter yield, harvest index is low, and that figure is shrinking.

The percentage of grain protein

Analysis of variance showed that the 1% level humic acid on seed protein content is significant. Comparisons with the average highest and lowest percentage of protein in the seeds treated with acid Humic macro Humic the acid value was 1.30 and the rate was 41.25.. Protein function is a function of plant nitrogen. Humic acids by increasing nitrogen increased leaf area and plant protein does. رIncreasing membrane permeability of root cells in Humic acid absorption and transport are more elements (Akynsy et al, 2009). In a study Noble et al (2002) showed that the use of Humic acid in corn increased 23% and 39% dry weight of shoot and root dry weight increased significantly in soil nitrogen and nitrogen concentrations than the control plants were stored.

Due to the variance effect on grain protein percentage figure is significant at the 5% level. Average highest and lowest average number of treatments in accordance with comparisons of seed proteins, respectively, compared to the islands of 24.26 and 92.25 the number of blessings. I figure between the average grain protein percentage a blessing and SHAMI, there was no significant difference.

The study compared the effects of two treatments Humic acid and the highest number of acid treatments and the number of macro Humic blessed with 53.30 and the lowest value of the acid treatment and the number of macro Humic SHAMI rate was 73.21.

The synthetic amino acid protein is an integral part of the protein nitrogen. The amount of nitrogen to protein can be increased.

A stepwise regression to yield

According to Table 4-6 of the components in the stepwise regression yield the greatest impact on grain yield, biological yield and harvest index have. So we need to achieve higher yield on harvest index and biological function to work. Since the harvest index of economic performance Tqysm biological function is achieved, thus increasing the economic performance can be increased harvest index.

Table 1. The stepwise regression for yield and other traits as the dependent variable as independent variables

1	2	3	Variable added to model
-29.719	-10.2227	-36.2031	Constant
59.0**	45.0**	48.0**	Total dry weight
	03.50**	32.45**	Harvest index
		-10.0^{ns}	Shoot dry weight
93.99	94.99	95.99	R^2

Ns and **: Stepwise regression coefficients in the last stage is Significant at the 1% level

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