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THE EFFECT OF FERTILIZERS OF DIFFERENT CHEMICAL RATES AND COMPOSITION ON THE NUMERICAL DENSITY (*Aphis fabae* SCOPOLI) ON BEAN

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ABSTRACT: The study was carried out at the research station of the Department of Crops Faculty of Agriculture, Omar Mukhtar University, Al-Bayda - Libya during the agricultural season 2005 – 2006 to study the effect of different rates of fertilizer on *Aphis fabae* Scopoli and bean yields. The results showed that there is a relationship between the numerical density of the pollen and the different fertilizer levels, where the results showed the following: 1- the highest numerical density of Aphid is on the beans when add in Aphid to the laboratory beans by 0.0 nitrogen ,144 Phosphorus, 144 potassium, while it decreased to 65.0 upon addition when adding 30 nitrogen and 144 phosphors and 0.0 potassium and these levels negatively affect the number of seeds and the number and pods for different levels and rates. 2- The flowering characteristic is delayed for (116.5) days upon addition of 144 kg/ ha phosphorus, 144 potassium and 30 kg/ ha nitrogen. 3- The effect of plant height on fertilization levels, as the highest was 50.3 cm, either when adding 144 kg/ ha phosphorus, 57 kg/ ha potassium and 60 kg/ ha nitrogen and there were significant differences between numbers of branches at fertilization levels. 4- Also, it was found that there were significant differences between the weight of pods, had the most weight when the reaction of 74 phosphorus, 57 potassium and 60 nitrogen kg /ha which was 12.25.

Key words: Faba bean**,** Aphid**,** *Aphis fabae* Scopoli, fertilizer, NPK, yield, chemical composition.

INTRODUCTION

As a result of the steady increase in the population due to the progress of civilization, which has led to improved standard of living and increased demand for diverse foodstuffs, the global food crisis has become real and is constantly worsening. The expansion of the cultivation of legumes and attention to their research, improving their quality and raising their nutritional value will of course provide new economic resources that will increase agricultural expansion, especially in the Arab world, given the favorable climatic conditions in this region **(Ali *et al.*, 1990)**.

Legumes played a key role in human food and came immediately after the grain crops because of the high protein content of these crops compared to the grain crops that are characterized by high protein compared to grain crops in addition to containing starch, vitamins and salts necessary for the body **(Bishop *et al.*, 1980)**. It is noticeable that the proportion of the area of food legumes increases in countries where the sources of animal protein (meat and milk) are low and decrease as animal protein increases **(Mayouf, 1982)**.

Faba bean (*Vicia faba* L.) is a major food and feed legume containing 24–30% protein **(Sahile *et al.*, 2009)** and 51–68% carbohydrate **(Hendawey and Younes, 2013)** depending on the genotype. Protein content of faba bean is two–three times higher than that of staple cereals **(Basra and Randhawa, 2002).** Faba bean cultivation increases the sustainability of cropping systems by adding nitrogen (N) to the soil through symbiotic N_2 fixation and therefore reducing the consumption of fossil fuel energy required for manufacturing fertilizer **(Jensen *et al.*, 2010)** and improving soil health. In addition, faba bean is beneficial to cropping systems as a break-crop, where it plays an important role in rotation with cereals by breaking

the disease cycles of various pathogens and pets (**Nebiyu *et al.*, 2016; Rose *et al.*, 2016).**

Faba bean (*Vicia faba* L.) is an important cool-season legume crop that ranks fourth after chickpea (Cicer arietinum L.), field pea (*Pisum sativum* L.) and lentil (*Lens culinaris* L.) in terms of total production. The global production of faba bean was 4.8 Mt in 2017, with China, Ethiopia and Australia being the largest producers (1.8, 0.93 and 0.37 Mt, respectively). However, its area of production is not increasing relative to other crops, mainly because of high yield instability. This can be attributed to several factors related to plant traits (e.g. phenology, morpho-physiology) and biotic and abiotic stresses. Faba bean has a very poor flower: pod ratio, with a maximum 20% of flowers resulting in pods **(Alharbi and Adhikari, 2020)**.

Its area in Libya is estimated at about 5,000 hectares and an average output of 0.5 tons/ha **(FAO, 2000)** and beans are considered important crops in Libya and the Tripoli region alone produces 53.5% of the production of dry beans and is tracked by the corner, while the Green Mountain area is one of the most important areas for growing beans.

Increasing interest in Libya in the cultivation of the bean crop to contain its seeds on high protein and carbohydrates, which is an important source of food for the ease of planting it for farmers **(Mohammed, 2003)**, so that the beans are grown in most types of soil and the seeds are grown and they are dry, but the farmer prefers the process of purification in water for a period of between (12-24 hours) before planting where it helps and speed up the germination process **(Hassan al-Toumi, 1995)** but the bean crop is infected in the field with many insect pests and some diseases and parasites, which some researchers listed in their scientific studies such as **Mustafa and Moumni (1990) and Gerges and Mohammed (1992).**

Aphids cause considerable damage to numerous crops all over the world and insecticides are the main means of controlling them, despite their detrimental impacts on human and environmental health **(Nordey *et al.*, 2021).**

It is considered one of the most important insect pests scattered inside Libya **(Najjar and Nfarya, 2001)** as confirmed **(Al-Ghariani *et al.*, 2000)** that one of the most important pests recorded in Libya on legumes in the Green Mountain region

The economic importance of the insect of beans is due to the fact that it infects many economic families and wild, and attacks whole insects and nymphs and new leaves developing, and when the severity of the injury on the plant leads to twisting of the leaves and yellowing and the fall of a high percentage of flowers and different injury of black man on beans between varieties, some varieties are medium injury and others are highly sensitive **(Gerges and Mohammed, 1990).**

The symptoms of direct injury are the absorption of plant juices, peripheral growths, leg, branches, flowers, buds, green pods, and results from the injury, the distortion and wrinkle of leaves, and therefore the severe injury to the fall of fruits and the wrapping of buds and honey symposium secretions, which helps to grow and the occurrence of secondary injuries such as black mushrooms on the plant in the areas of nutrition in the areas of nutrition and due to the importance of this economic crop increased interest by researchers in the study of plant varieties with high tolerance or less sensitive to insect infections, as have been conducted control methods with different methods of what are different. Positive effect in reducing the number of men and thus increasing production **(Younis *et al.*, 1985)**.

MATERIALS AND METHODS

The place of study

The study was carried out at the research station of the Department of Crops Faculty of Agriculture, Omar Mukhtar University, Al-Bayda - Libya during the agricultural season 2005 – 2006.

Source of insect community for insect of *Aphis fabae* scopoli

The insect community was obtained from plants infected with black beans in the same geographical scope of the study (infected farms in the intermediate area) and various phases were placed in well-ventilated petri dishes and transported to the laboratory on the same day directly

Laboratory education

Planting the municipal bean plant in medium-sized plastic bags in the laboratory of the prevention department under conditions (temperature 2∓23 and humidity 5∓37). All the appropriate conditions were provided for him from agricultural processes such as irrigation, freshness of grass, daily observation of plants and the growth of the vegetative total, i.e. when the formation of three or four leaves were transferred from the beans to the bean plant by a small brush by placing it on the leaves where the accuracy was taken into account in the transfer process. This study, which is in our hands, was carried out in three stages.

First: Laboratory study

To identify sensitive and resistant species of bean species for black bean aphid, (*Aphis fabae* Scopoli) the laboratory study was conducted in the laboratory of the Department of Prevention - Faculty of Agriculture - Omar Al-Mukhtar University during the agricultural season 2006/2005 by designing

completely randomized block segments with four repeats and each containing a duplicate of five plants.

Four varieties of beans were grown in the region, namely (municipal, Egyptian, English, Reina Blanca) and obtained from many research sources (Agricultural Research Center in The District of Al-Fatayeh, Derna Department of Prevention and Crop Department, Faculty of Agriculture Omar Al-Mukhtar University and some research stations in the region).

These items were planted in plastic bags and placed in each bag 6 seeds, after they were confirmed free of any faba and then soaked to help the speed of germination, and all the laboratory conditions suitable for the growth of plants were provided from the temperature of 2∓23 and relative humidity 5+37% and appropriate lighting 12:12 (L:D).

As well as all agricultural processes of regular irrigation were carried out at appropriate rates and the removal of grass escarpments and after the growth of plants was relieved plants in order to give a good vegetable compound in order to cause industrial infections and then move the insect community to an insect of black beans of infected plants from some fields through a small brush so that they were touched to the leaves gently and carefully.

A week after the procedure of industrial infection, tested the severity of the sensitivity of the varieties by direct counting of insects of the form on different plant parts (upper leaves - the leaves in the middle as well as the bottom leaves of the plant) by following the method of counting **(Hindi *et al.*, 1998)** weekly during the study season and on different ages of the plant.

Second: Field Education

The beans, the most commonly traded municipal plant for farmers in the region, were grown in medium-sized plastic bags, after the seeds were tested and free of any injuries, and soaked in water to help speed up the germination process, which was carried out in the research station in the department of crops Omar Al-Mukhtar University, Al-Bayda and then do all the agricultural processes necessary for the growth of a plant healthy and free of any injuries, and after the growth of the vegetable total appropriately Insects were raised from the beans on it and obtained from the source of the insect community, in order to conduct further field studies, knowing that the plants were not treated with any kind of pesticide and did not use any method of pest control.

Third: The effect of different fertilizers chemical compositions on the numerical density of the pest and the crop

The field study was conducted in the research station in the Department of Crops - Faculty of Agriculture - Omar Al-Mukhtar White University during the agricultural season 2005-2006. Planting of the municipal item, which was obtained from the Agricultural Research Center in Al-Fatayeh area/ Derna.

In large plastic bags and the design of the practical experiments was implemented - random sectors three factors i.e. 3 types of fertilizer and each fertilizer three levels and four repeaters, and the bags were numbered and placed in each bag 5 seeds, and were monitored daily with the commitment to provide all the conditions suitable for them, and after the growth of the vegetative total well was relieved of the weak plants and keep one plant intact and free of an infection; Used for chemical fertilizers circulating by farmers in the region and used according to the rates shown later as shown in Table (1).

Fertilizer used	Chemical code	Rates of fertilizer used kg/hectare
Nitrogen/Urea (46.5%N)	N	First level 0.0 kg/E 0.0g/pot 2nd level 30kg/e 0.42g/pot 3rd level 60kg/eg/pot
Super Phosphate (Calcium-mono phosphate) (15.5% P_2O_5)	P_2O_5	First level 0.0 kg/h0.0 g/pot 2nd level 74kg/e 0.0g/0.63g/pot 3rd level 144kg/e 1.62g/pot
Potassium sulfate (48% K_2O)	K_2O	First level 0.0 kg/E 0.0 g/pot 2nd level 57 kg/e 0.0g/pot 3rd level 144kg/e 0.66 g/pot

Nitrogen was added as form urea (46.5N) at rates (0.0, 30.60 kg/e) and phosphorus was added to the form of calcium phosphate at rates (0.0, 74, 144 kg/e).

After the addition of the three fertilizers and their levels was performed industrial infection with insects of beans on the plants tested (females and nymphs) and the bags that were added nitrogen fertilizer to it and fertilizer phosphate mono-calcium as well as sulfate potassium without interference, were placed on the plants breeding cages in the form of Transparent plastic cylinders to isolate the extreme phases and nymphs where the diameter of the cylinder was 14 cm and height 10 cm, and these cages were open from one of the limbs to allow the entry of air and light to them, placed isolated near the blade of the paper and after ten days of infection the following was studied:

The appearance characteristics of the crop

1- The number of days needed to start completing the flowering: is the number of days needed from agriculture and it opens the first flower where the date of agriculture was recorded until the first flower was opened and calculated the period between them and thus calculate the averages.
2- The height of the plant (cm): In this capacity the distance from the surface of the soil to the top of the plant was measured.
3- The number of branches /plants in which the branches were counted in each plant and recorded.

Crop qualities

1- The number of pods / plants counted and recorded on each plant.
2- The weight of the pods (g/plant): the pods were collected for each plant and placed in small bags and placed in each bag the number of the bag from which it was collected and the small bags were transferred to the laboratory of the department of prevention and weighed using the delicate balance (milligrams).
3- Number of seeds: Seeds have been counted in each of the centuries that have been collected and recorded.

The characteristics of the lesion

There are many ways to calculate the numerical density of the pest field, which is the absolute and relative method and, in this study, the absolute method was adopted where the rates of numerical density were calculated by direct counting of the plant, on the leaves and stems where I follow the method **(Hindi *et al.*, 1998)** so that the insects present on the plant parts were calculated.

Female weight

Five females were taken from a bean insect from each bag where the cages were placed on it and the three fertilizers were added, the females were placed in boxes to collect their insects and transported them to the laboratory of the department of prevention and weighed by the delicate balance (ml/g) and took the general average of each bag and calculated the weights of females weekly throughout the agricultural season 2005 -2006 where he followed the method **(Mustafa and Samara, 1999)**.

Calculating the weight of nymphs

In the same way as calculating female weights of beans, the weight of nymphs was calculated, and the overall average per bag was taken and the readings were taken weekly throughout the study season during the 2005/06 seasons.

Chemical analysis of the plant

To conduct chemical analysis of nutrients in the varieties used in the laboratory study, took 3 plants from each of the bags that were cultivated in the department of prevention, and took the leaves from each plant washed and weighted and then put inside the electric furnace under the temperature of 70 degrees m for 48 hours and then reweighted and milled and analyzed its content of phosphorus, nitrogen and potassium in the department of gardening and the soil department of the Faculty of Agriculture Omar Al-Mukhtar / According to the scientific methods followed & used.

Statistical analysis

The study was designed by Randomized Completely Block Design (RCBD) and then analyzed statistically obtained results by Anova method) and averages were isolated by a multi-stage Duncan test under a probability of 0.05%.

RESULTS AND DISCUSSION

A) Plant parts (leaves)

The results showed that there are significant moral differences between the types of beans tested at the level of 5% moral difference to analyze the contrast, the record of the English class average density of 13.7, which is more dense numerical between the varieties and concentrated in the upper leaves from the rest of the plant may be due to the modern leaves are preferred by the mana due to the content of nutrients or return to the leaves and soft and confirmed this study (Wojciechomiz and ZytoKo) while the Egyptian class recorded an average density of 13.3 where it was close to the English class in the degree of sensitivity and on the other hand the numerical density on the class Reina Blanca 11.3 and is considered the average sensitivity, while the average was 8.3 individuals,

which is the lowest numerical density of those registered on the municipal category; **Selim *et al.* (1989)** of Egyptian beans, i.e. municipal in Egypt, as well as confirms what he said **Younis *et al.* (1985**) and **Sharma and Yadav (1994)** that the increasing in numerical density is due to any type of crop and the disturbance of the field, shows in (Table 2 and Fig.1)**.** .

Table 2. Sensitivity 4 varieties of bean being infected by black aphids (*Aphis fabae* Scopoli) in three parts of the plant after three weeks of plantation through the agriculture season 2005/ 2006

Varieties	Plant parts (leaves)			Average
	Leaves of top plant	Leaves of center plant	Leaves of bottom plant	
Renablanca	12.2 c	11.2 b	10.7 b	11.3 b
Local	9.0 d	7.3 d	8.7 c	8.3 c
Egyptian	15.3 a	13.7 a	10.0 b	13.0 a
English	13.5 b	10.3 b	17.3 d	13.7 a
Average	12.5 c	10.6 b	11.7 a	11.6 b
		LSD = 2.8		

Numbers which have similar liters with the same column doesn't have difference at the level 5% at Duncan multiple stages test.

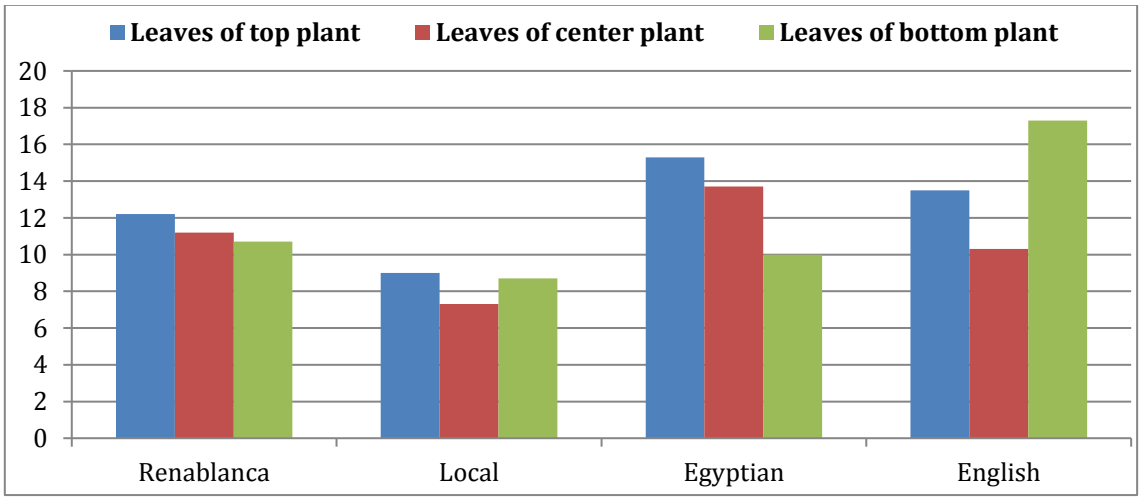

Fig. (1) Sensitivity 4 classes of bean being infected by black aphids (*Aphis fabae* Scopoli) in three parts of the plant after three weeks of plantation through the agriculture season 2005/ 2006.

When studying allergies, it was found that the injury from the first week of the second week of the third week to the fourth week of germination showed that there are moral differences at the probability of 5% for contrast analysis where the average numerical density was recorded 13.7, 11.3, 8.6, then 7.2 for the classes of the Egyptian test field, English, Reina Blanca and then the municipal.

The degree of sensitivity was high and then resistant and recorded by the municipal class, as confirmed by **Selim (1989)** as well as the recorded by **Sharma and Yadav (1994)** on the sensitivity of some local and imported varieties. Also, confirms what **Younis *et al.* (1985)** in their study on the effect of allergies on growth and reproduction under different rates of fertilization.

The results in Table (3) and Fig. (2) of the numerical density of the black man four weeks after the germination of the seeds show that there are significant moral differences between the different tested varieties, Where it was the highest numerical density of the English class converging with what was recorded in the third and fourth week after germination, which reached 13.5 on average, then recorded 11.4, 7.5 followed by 3.8 for both the Egyptian and Reina Blanca and then the municipality respectively and again the municipal class record less numerical density for those who may be due to the compositional composition For the plant in general, and the substances it contains that are unacceptable by the pest or may be due to the nutritional preference of other species due to the adaptation of the lesion on this species, thus gained resistance to the pest and this is close to the extent mentioned **(Murad, 2004)** that certain nutrients inhibit the action of *Vicia Faba*.

Table 3. Sensitivity 4 varieties of bean being infected by black aphids (*Aphis fabae* Scopoli) in three parts of the plant after four weeks of plantation through the agriculture season 2005/ 2006

Class	Plant parts (leaves)			Average
	Leaves of top plant	Leaves of center plant	Leaves of bottom plant	
Renablanca	9.5 c	7.0 d	9.3 b	8.6 cd
Local	8.7 e	7.7 d	5.2 c	7.2 d
Egyptian	14.0 a	11.3 b	15.2 a	13.5 a
English	13.3 ab	12.0 a	9.8 b	11.7 a
Average	11.4 ab	9.5 c	9.9 b	10.3 b
		LSD = 3.1		

Numbers which have similar liters with the same column doesn't have difference at the level 5% at Duncan multiple stages test.

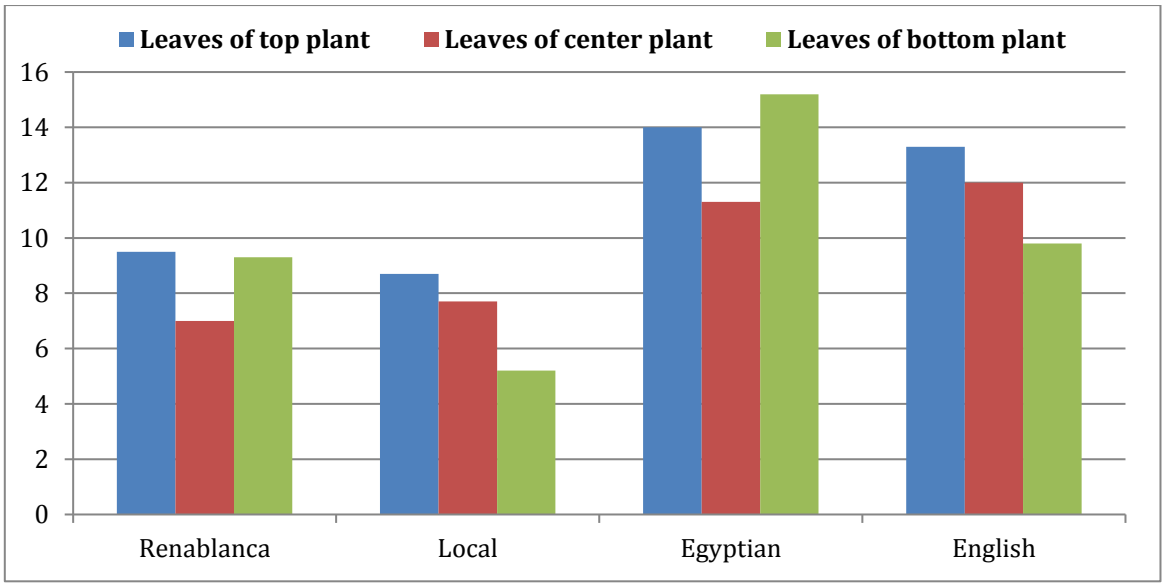

Fig. (2) Sensitivity 4 classes of bean being infected by black aphids (*Aphis fabae* Scopoli) in three parts of the plant after four weeks of plantation through the agriculture season 2005/ 2006.

Through the results of the study it turns out that there are moral differences between the plant parts of the varieties and especially the leaves where it was found that the modern upper and then middle leaves are the most preferred for those in the Egyptian and English category, and may be due to the modern leaves are in the eating of the pierced parts of the mouth absorbent plant or may be due to the ease of the outer skin layer of the leaves, so it is the preferred food resulting from increased numerical density and this conclusion may be attributed by the mention **(Gally and Foester, 1976)**, which showed that there is a relationship between the aphids and the different aspects of nutrition on copper and cadmium, thus increasing the intensity of the count to very high levels.

Plant height (cm)

As shown in Table 4, the results of the effect of the reaction between the levels of nitrogen and phosphorus fertilization on the height of the plant where it gave moral differences between levels of nitrogen fertilization and was on a rise of the vegetative total of the plant at fertilization 60 nitrogen kg /ha and reached the height to 42.3 cm while the height rate decreased 37.2 and 37.7 cm at fertilization at the level of 0.0 and 30 nitrogen kg/ha respectively and was given phosphorus at the rate of 144 height of 41 cm.

The results of the study contained in the on the interaction between levels of fertilization with nitrogen and potassium and their effect on the height of the plant where there are moral differences between the levels of fertilization and given 50.0 kg /ha of other potassium, which reached 40.5 cm while no moral differences were recorded between the levels of fertilization previous results confirm what he mentioned by **Naeem and Sharef (1977)** affects the numbers of the total vegetables and the number of vegetables and the number of vegetables.

The interaction between nitrogen and potassium fertilization levels (60 nitrogen and 0.0 phosphorus/ha) was given a plant height of 43.0 cm, while the lowest height at fertilization was 0.0 nitrogen and 144 potassium/kg/ha.

Summarizes the results of the interaction between the levels of fertilization with phosphorus and potassium, which were moral while potassium gave the least height, and to increase the study of the relationship between the effects of different fertilization rates nitrogen, phosphorus and potassium and the results showed that there are moral differences and that the highest height 144 phosphorus and 57 potassium while 60 nitrogen slower height 33.8 cm was when the reaction between 0.0, 57 and 60 phosphorus, potassium and nitrogen respectively, this is confirmed when reacting to different fertilization rates.

Plant growth or vegetative total is affected by increased fertilization rates and fertilizer type. The current study is consistent with his mention **(Shafiq, 2003)** that the bean plant was given an increase in vegetative growth when adding phosphate fertilizer on the other hand, where the addition of nitrogen fertilizer from 30-60 kg / ha high plant excellent and a good vegetable total **(Al-MuKhtar, 2001)**.

This is consistent with the results of the current study, as consistent with what he mentioned **(Eid *et al.*, 1988)** when adding rates of phosphate fertilizer encouraged the vegetative growth of the plant record the use of levels of fertilization 144:60 nitrogen: phosphorus is the highest height of the plant at a rate of 47.8 cm while the lowest height recorded at the interaction between nitrogen and phosphorus 47:60 where it reached 36.0 cm and recorded length with 74:00 nitrogen: phosphorus and the lack of difference in length here may be due to the stability of phosphorous manure which is believed to be responsible for the height of the plant although there is no significant injury.

Table 4. Effect of interaction between nitrogen, phosphorus and potassium fertilizers rats on plant height during 2005/ 2006 seasons.

P_2O_5 (kg/ ha)	K_2O (kg/ ha)	N (kg/ha)		
		0	30	60
0	0	6.00b-f	0.50f	625b-f
	57	3.75c-f	4.50b-f	9.50abc
	144	10.00ab	4.00c-f	2.50def
74	0	4.88b-f	0.63ef	3.75c-f
	57	3.88c-f	10.00ef	12.25a
	144	2.50def	6.25b-f	6.00b-f
144	0	3.38a-d	7.25a-d	7.38a-d
	57	1.13ef	5.25b-f	6.38b-f
	144	1.50def	6.63a-e	3.50c-f

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

Number of branches

The data in Table 5 revealed that the interaction effect between nitrogen and phosphorus fertilization levels on the characteristic of a number of branches/ plants during the academic season 2005 - 2006. The results from that there were moral differences between nitrogen levels where there was an increase in the number of branches at the level of 60kg/ha. Nitrogen (0.5) while fertilization 0.0 and 30 kg/ha nitrogen a given 0.3 0.4 of branches respectively, that there are moral differences between the levels of phosphorus fertilization where fertilization was given 0.0 and 74 kg/ha 0.5 respectively while the level 144kg/ ha was given 0.3 described.

A study of the interaction between nitrogen and phosphorus fertilization levels shows that there are moral differences between the levels of reaction where the reaction between 60 nitrogen and 74 phosphorus was given 0.8 while when the reaction between 30 nitrogen and 74 phosphorus was given 0.2.

When studying the effect of the interaction between nitrogen and potassium on the characteristic of the number of branches there are moral differences between the levels of fertilization with potassium where the best level of fertilization was at 0.0 57 kg/ ha potassium which was given 0.4 and 0.4 respectively while given fertilization at rate of 144 kg/ ha I give an average of 0.3.

When studying the interaction between nitrogen and potassium fertilization levels there are moral differences between the levels of reaction 60 nitrogen and 144 potassium as well as 60 nitrogen and 57 potassium, each of which was given 0.6 0.5 respectively described in the form. And by studying the effect of the interaction between the levels of fertilization with phosphorus and potassium on the characteristic of the number of branches.

Showed that there were moral differences between the levels of interaction where the reaction between 0.0 phosphorus and 144 potassium was given 0.7, the interaction between 0.0 nitrogen and 0.0 potassium was given 0.3 and there were no

differences between the levels of others described the effect of the interaction between levels of nitrogen, phosphorus and potassium fertilization on the characteristic of the number of branches and that there are moral differences between the levels of interaction where the reaction was given between 74 144 potassium and 60 nitrogen 0.1 as well as 0.0 phosphorus and 144 potash The day and 30 nitrogen were 0.1 while the interaction between 144 and 57 potassium and 30 nitrogen, as well as 144 phosphorus, 144 potassium and 30 nitrogen, were given 0.2 and 0.2 respectively.

Table 5. Effect of interaction between phosphorus and potassium fertilizers rats on number of branches during 2005/ 2006 seasons

P_2O_5 (kg/ ha)	K_2O (kg/ ha)	N (kg/ha)		
		0	30	60
0	0	0.3f	0.3f	0.4e
	57	0.5d	0.3f	0.3f
	144	0.8b	1.0a	0.3f
74	0	0.4c	0.2g	0.8b
	57	0.4c	0.3f	0.6c
	144	0.2g	0.2g	1.0a
144	0	0.3f	0.4c	0.4e
	57	0.3f	0.2g	0.5d
	144	0.4c	0.2g	0.4e

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

B) Crop quality

Flowering characters of in the bean plant

The results were no moral differences between nitrogen fertilization levels during 2005-2006 at 0.5 percent for a ANOVA analysis at a fertilizer rate of 30kg/ ha for a time period of 112 4.4 days while at 30kg/ ha fertilization for 112.2, both were given a delay in the flowering of the plant, although there were moral differences between the transactions compared to the witness for a period of 108.3 days where the witness was given an early in the process of flowering the plant (Table 6).

That the process of early agriculture leads to early flowering is among the agricultural methods in control, where the study showed that nitrogen fertilization at the rate of 30 kg/ ha last day of flowering plant, which results in the low numerical density of the pest on flowering for the insect of man, which is related to the weather factors of the temperature and humidity of **(Murad *et al.*, 2004)** studied the effect of some nutrients on productivity and on the numerical density of those who noted that the numerical density of those who decrease after the delay editing of the plant what the researcher found in accordance with the current study.

On the other hand he explained **(Awmack and Harrin Gton, 1998)** that the numerical density increases by increasing CO_2 to the bean plant while the growth of the plant decreased significantly, and this is not consistent with the results of the study at the levels despite the difference in elements and rates and when mixing nitrogen fertilization and fertilization with phosphorus under the same levels above the previous levels I give the mixture 30:144 nitrogen and phosphorous /ha moral delay in the process of flowering the plant for an average period of time 1 15.5 days this may confirm previous results with both nitrogen and phosphorus on the other hand, **Mejahed (2005)** found that the levels of the affected fertilizer when adding different types mixed with compost where high rates of production were given with reduced numerical density of the levels lower than the economic levels that the researcher found consistent with the current study in delaying flowering and increasing production of the bean crop.

The interaction between nitrogen and potassium at rates 0.0: 144 nitrogen: potassium kg/ ha gave moral differences with the delay in the process of flowering compared to the witness which is related to the numerical density of the one, which decreased in its density, while when the rate of nitrogen and the stabilization of potassium 144:30 kg / ha was the result was a delay in the process of flowering in the same way when level .0.0:.0.0 Nitrogen: Potassium kg/ha.

That the process of delay and early flowering suggests that the study is a method of the escape of the plant from the pest, which is reflected positively by the increase and this is consistent with **(Elkhyat, 1998 and Eldafrawi *et al.*, 1990)** in their study.

The addition of levels of 160-320 kg/ acre of nitrogen fertilizer led to early flowering and low numerical density **(Eid *et al.*, 1988)** the numerical density of those affected by nutrition and thus reflected positively on the productivity of the crop **(Walters *et al.*, 1988)** and the addition of some

fertilizer improves productivity and reduces injury this is the addition of phosphorus and potassium 0.0: 57 kg/ ha phosphorus: potassium where i was given early in flowering with an average of 170.2 days while the flowering delayed by approximately 3 days 113.5 days at the rate of 44: 57 kg/ ha phosphorus: potassium.

The interaction between nitrogen, phosphorus and potassium 0.0: 57: 0.0 kg/ha gave moral differences at the probability of 0.5% where the numbers of aphids decreased and the average flowering was 105.8 where it was lower than the previous rates of different fertilization but when the rates increased 144: 144.30 kg/ ha give the same method to delay in flowering at a rate 10 days from previous levels in fertilizers mixed the early process may be due to low fertilizer rates as opposed to the delay of increased rates low this is in line to some extent with his recorded by **Awmak and Harrington (1998)** when adding nitrogen and phosphorus to measure the growth rates of the peas plant where the weight of the total vegetation increased by 14% but did not affect the flower process.

The addition of the element may increase the numerical density of the lesion or generally lack it adversely or positively affect the resulting crop.

Table 6. Effect of interaction between phosphorus and potassium fertilizers rats on flowering time during 2005/ 2006 seasons

P_2O_5 (kg/ ha)	K_2O (kg/ ha)	N (kg/ha)		
		0	30	60
0	0	106.3d	109.0df	113.8b
	57	105.8f	108.0d	107.8df
	144	106.d	111.3bc	114.0b
74	0	109.0b	115.5a	111.0c
	57	108.1bc	108.3d	113.5b
	144	113.3a	113.5b	111.3c
144	0	107.0c	115.5b	108.8d
	57	110.0b	114.5ab	116.0a
	144	108.5b	116.5a	113.5b

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

Number of pods

In Table 7, the results of the interaction between nitrogen and phosphorus fertilization levels on the characteristic of the number of pods / plants during the agricultural season 2005-2006, showed that there are moral differences when analyzing the variation 0.5% between levels of nitrogen fertilization was the best level of fertilization 60.00 kg/ hectares of nitrogen where the results were average 4.17 and 4.52, compared to the level 30kg/ha which harvested 3.23 century and given phosphorous fertilization recorded the best level at the average of 144.00 which was given 4.083- 4.986 centuries respectively while the level decreased 74kg /ha of phosphorus in production to reach 3.106 centuries. When the overlap between fertilizers and levels was studied, the results showed that there were moral differences between the levels of interaction between nitrogen and potassium 74:60 kg/ha, resulting in 2.73 horns, the lowest average in fertilization rates and their interactions.

The research study showed that the addition of phosphate fertilizer at appropriate rates to the vegetation plant as well as the number of pods and their weight, and this is obtained in the current study also confirms what you get **(Al-Mukhtar, 2001)** addition of nitrogen fertilizer and phosphate at rates of 30, 45, 60 kg / ha) was given a global average of the number of pods and a direct fit with the numerical density of insects.

When studying the interaction between different levels of fertilization through nitrogen and potassium over the number of centuries, the results showed that there are no moral differences between levels of potassium fertilization, but there is a moral difference when introducing nitrogen fertilization in the interaction at different levels where the reaction between 0.0:0.0 nitrogen and potassium was given an average of 6.875 centuries while the interaction 57:30 was an average output of 2.874 which It is considered a bit of a thing and may be due to the rate of 0.0 in both elements gives better results so that it reflects positively in reducing the number of pests and thus increasing the number of pods because the level zero does not give good nutrition to the plant, and therefore deprives the pest of nutrition, but when the phosphorus is added in the interaction with potassium under the probability of 0.5 of analysis of the variation between averages where i was given fertilization in both nitrogen and potassium in different levels.

The results showed that there are moral differences between the levels of interaction and here is the reason for the increase in the number of pods is the phosphorous rate of 144 kg / ha where it reached 2.167 centuries and this is consistent with what **Al-Showny *et al.* (2001)** mentioned when adding phosphate fertilizer and phosphorous for the bean plant at different rates.

In a study of the effect of variation of the three fertilizers as well as different rates and levels of nitrogen, potassium and phosphorus, the results recorded high moral differences at the probability of 0.5 ANOVA variations analysis at the interaction between 144, 0.0, 0.0 phosphorus, potassium and nitrogen respectively were given an average number of centuries to 11,750, while when phosphorus and potassium were installed at 144 kg/ha and nitrogen 0.0 kg/ha, the average number of pods decreased significantly to 1,000 centuries.

In a study by **Farid and Gayed (1976)**, it was found that the addition of phosphate fertilizer when used at nitrogen rates and the use of manganese to soak seeds gave excellent growths, horns and seeds to be consistent with the current study in the rates of fertilization between phosphate and nitrogen, although the method of cultivation is different, i.e. the soaking of seeds.

The results of the interference show that when the rate of nitrogen increases the production of the horns is few, which you believe that the increase in nitrogen fertilization abounds in the numbers of the plant and the production reduces the results of similar results obtained by **(Ellitt and Hod, 1996 and Tjallini, 1976)** on the plant of beans and under the fertilization of nitrogen.

Table 7. Effect of interaction between nitrogen, phosphorus and potassium fertilizers rates on number of pods 2005/ 2006 seasons

P_2O_5 (kg/ ha)	K_2O (kg/ ha)	N (kg/ha)		
		0	30	60
0	0	4.63c	3.50c	4.00c
	57	4.25c	1.88ef	6.00ab
	144	6.25b	2.75e	3.50c
74	0	4.25c	1.25f	1.00f
	57	2.00d	1.50cf	3.75c
	144	4.00b	6.75a	3.45cd
144	0	11.75a	4.25bc	7.00a
	57	1.63e	5.25b	5.75b
	144	1.00ef	2.00c	6.25ab

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

Weight of pods

As illustrated in Table 8, the study of the effect of the interaction between levels of nitrogen and phosphorus fertilization on the characteristic of the weight of the horns gram/ plant and that there are moral differences between the levels of fertilization with phosphorus described.

When studying the interaction between nitrogen and phosphorus fertilization levels, it was found that there were moral differences between the levels of interaction where the average horn at the reaction was 60 nitrogen and 74 phosphorus/ha 7.333 grams, while at the interaction between 30 nitrogen and 74 phosphorus, the average weight of the pods was 2.655 g.

The study of the effect between levels of nitrogen and potassium fertilization on the characteristic of the weight of pods (grams)/ plant there are moral differences between levels of potassium fertilization where the level of fertilization was at 57 kg / ha 5.292 g while the level was given 0.0 and 144 kg / h/ 4.764 grams respectively, the average weight of the century when interfering between 60 nitrogen and 57 potassium 9.375 grams, was given the overlap between 30 nitrogen and 0.0 potassium 2.792 g.

Through it was found that there were moral differences between the levels of interaction where the interaction between 144 phosphorus and 0.0 potassium was given 7.333 g, while the interaction between 74 and phosphorus and 0.0 potassium 3.083 g was given as described.

When studying the interaction between nitrogen, phosphorus and potassium fertilization levels on the weight of table pods it was found that there were moral differences between the levels of reaction, with the reaction between 0.0 phosphorus and 0.0 potassium 30 nitrogen 0.500, while the reaction between 0.0 phosphorus, 144 potassium and 0.0 nitrogen was given 10.00 g.

Table 8. Effect of interaction between nitrogen, phosphorus and potassium fertilizers rates on weight of pods 2005/ 2006 seasons

P_2O_5 (kg/ ha)	K_2O (kg/ ha)	N (kg/ha)		
		0	30	60
0	0	6.00b-f	0.50f	625b-f
	57	3.75c-f	4.50b-f	9.50abc
	144	10.00ab	4.00c-f	2.50def
74	0	4.88b-f	0.63ef	3.75c-f
	57	3.88c-f	10.00ef	12.25a
	144	2.50def	6.25b-f	6.00b-f
144	0	3.38a-d	7.25a-d	7.38a-d
	57	1.13ef	5.25b-f	6.38b-f
	144	1.50def	6.63a-e	3.50c-f

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

Number of seeds

When studying the effect of the interaction between nitrogen and phosphorus fertilization levels on the status of the number of seeds / plants during the season 2006/2005 it was found through the that there were moral differences between nitrogen fertilization where the average number of seeds was 7.944 seeds at the level 0.0 kg /ha nitrogen while at level 30 and 60 kg / ha was 6.764 and 7.250 seeds respectively.

As for phosphorus levels, the Table (9) showed that there were moral differences, with the average number of seeds being 7,778 seeds at 74kg/ha, while at 0.0 and 144 kg/ha, the average number of seeds was 6,736 and 7,444 seeds, respectively. When the reaction between nitrogen and phosphorus levels was affected, there were moral differences between the levels of interaction between 0.0 kg/ha nitrogen and 74 phosphorus/ha 8.792 seed, while the interaction between 30 kg/ha, 0.0 phosphorus/ha and (60 kg/ha and 0.0 phosphorus) was given 5.708.

When studying the effect of the interaction between nitrogen and potassium fertilization levels on the status of the number of seeds / plant, that there are moral differences between levels of potassium acidification where at the level of 57 kg / ha the average number of seeds was 7.847 seeds while the level was given 0.0 and 144 kg / ha 6.06 39 and 7.472 seeds respectively also found that there are moral differences when interacting between 0.0 kg/ha and 57 kg/ha where 8,542 seeds were given while the reaction was given between 30 kg /ha nitrogen and 0.0 kg/ha potassium 5.750 seed.

When studying the effect of the interaction between the levels of phosphorus and potassium fertilization on the characteristic of the number of seeds/ plant it was shown that there are moral differences, when the interaction between 0.0 kg/ ha phosphorus and 0.0 potassium the average number of seeds was 6.083 seeds, while the interaction between 144 kg/ ha phosphorus and 57 potassium was the average number of seeds 8.750 and by studying the effect of the interaction between the levels of nitrogen fertilization, phosphorus and potassium on the number of seeds / seed.

Table 9. Effect of interaction between nitrogen, phosphorus and potassium fertilizers rats on number of seeds 2005/ 2006 seasons

P_2O_5 (kg/ ha)	K_2O (kg/ ha)	N (kg/ha)		
		0	30	60
0	0	8.25b	5.00c	5.00c
	57	7.50c	5.00c	7.13c
	144	10.63ab	7.13bc	5.00c
74	0	8.38b	6.63c	7.00d
	57	11.50a	5.00d	8.25b
	144	6.50cd	7.88bc	8.88b
144	0	7.13c	5.63e	6.75cd
	57	6.63d	10.50a	9.13a
	144	5.00d	8.13b	8.13b

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

It turns out that there are moral differences between the levels of interaction, as the interaction between 74 kg /ha and 57 kg/ha and 0.0 kg/ha nitrogen was given 11.500 seeds while the interaction between 0.0 kg/ha phosphorus and 0.0 kg /ha potassium and 60 kg/ha nitrogen, as well as 0.0 kg nitrogen, as well as 0.0 kg / ha phosphorus and 0.0 kg / hectare potassium I give 5.000 seed and interaction between 74 kg / ha / ha and 57 potassium and 0.0 nitrogen i gave 11.500 seed and this is consistent with what has been confirmed by several studies **(Al-Mukhtar, 2001; Elshowny *et al.*, 2001 and Naeem and Sharef, 1977).**

C) Chemical analysis

Table 10 shows in the series of analytical study of the differences between the varieties studied and then a chemical analysis of the vegetative total of the plant to find the proportion of elements of nitrogen, potassium and phosphorus as well as protein which shows that there are moral differences between the varieties in the proportion of containment of the elements where the municipal class recorded lower rates of elements, which may outweigh the hypothesis of the nutritional preference of the black insect and the promise of its reproduction on this class and this is consistent with what is mentioned by **(ELdafrawi *et al.*, 1990). Bastawisy *et al.* (1998),** who confirmed in their study that the elements or chemical compounds and protein for their presence in high proportions in the plant increase the numerical density of the lesion, on the other hand some studies have shown that the density of the breadwinner has nothing to do with nutrients **(Mohammed and Slama 2001).** What was recorded doesn't match what had been revealed in the current study.

Table 10. Sensitivity 4 varieties of bean being infected by black aphids (*Aphis fabae* Scopoli) NPK and protein of plantation through the agriculture seasons 2005/ 2006

Varieties	Nitrogen	Protein	Phosphorus	Potassium
Local	6.6 b	40.70 C	1.1 a	3.2 ab
Reinablanca	7.58 a	47.71 a	0.63 bc	2.6 c
Egyptian	7.44a	53. 46 b	0.76 b	3.1 a
English	5.46 c	42.75 b	0.59 d	3.2 ab

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

Characteristics of the lesion

The numerical density of the lesion

Through the study of the effect of the interaction between the different levels of nitrogen and phosphorus fertilization during the seasonal 2005-2006 P) it was found that there are moral differences between different levels of nitrogen fertilization (N) where the numerical density of the insect increased at the time of fertilization of 0.0 kg /ha now reached an average of 119.49 insects and when the rate of fertilization increased 30 and 90 kg / ha nitrogen decreased the number of fertilizing rate decreased 109.1 and 103.1 insects respectively current results show that the increase in the rate of nitrogen fertilizer may play a role in the escape of the pest from the crop, which reduces the numerical density of the pest as shown, which is consistent with what **Tjallinil (1996) & Ellitt and Hodgson found (1996)** some scientific studies indicate that the insect from insects affected by fertilizer is reduced due to its nutrition on the plant juicer. This is explained by a study carried out **Mejahed (2005)** when using different fertilizers and their interactions with the insect of aphids.

When moving to P_2O_5 phosphorus fertilization) the results show that there are moral differences between the levels of fertilization as shown in the Table (11) when conducting the Duncan test to isolate *Aphis Fabae* averages as it is at 0.0 and 74 kg/ha. The numerical density of *Aphis Fabae* Scopoli was recorded at 111.8 and 114.5 insects respectively, while this rate decreased when the fertilization rate increased to 144kg/ha when the density reached 106.0 insects.

Table 11. Sensitivity 4 classes of bean being infected by black aphids (*Aphis fabae* Scopoli) in three parts of the plant after six weeks of plantation through the agriculture season 2005/2006

Class	Plant parts (leaves)			Average
	Leaves of top plant	Leaves of center plant	Leaves of bottom plant	
Renablanca	6.2 c	2.8 e	5.3 a	4.8 d
Local	2.3 d	3.2 d	2.8 c	2.8 e
Egyptian	11.5 a	21.2 a	4.0 b	12.2 a
English	11.0 a	12.5 b	4.5 b	9.3 b
Average	7.8 b	9.9 c	4.2 b	7.3 c
		LSD = 3.5		

Numbers which have similar liters with the same column, doesn't have difference at the level 5% at Duncan multiple stages test.

The decline in numerical density may be due to fertilizer where **Naeem and Sharef (1977)** explained nitrogen, phosphate and phosphorus have a moral effect on reducing numerical density, as SeLim pointed out that cotton is negatively affected i.e. low numbers when fertilizing with mixed fertilizer (chemical + organic).

The results of the studies mentioned and the results of the current study may not correspond to what Crawford et al explained, that of beans is affected when fed on the host who receives a high amount of copper and cadmium despite the different elements found in the study.

To increase the emphasis on the effect of fertilizer and its reactions on the numerical density of the pest and thus the quality and quantity of production was studied the interaction between nitrogen and potassium to determine who is responsible for the numerical density of those below any level of fertilization.

The results showed that there are moral differences between potassium levels (K_2O) where the numerical density reached an average of 114.0 insects at the level of fertilization of 144 kg / ha but at the level of 0.0: 144 kg / ha nitrogen: potassium The numerical density increased to 120.9 insects, while it decreased significantly at the level of 30: 57 kg / ha where it reached 88.1 insect decrease and the rise in numerical density is related to fertilizer and this confirms what was mentioned earlier in this study and agrees with what was listed from the results of the previous study from the same field.

The interaction between the levels of phosphorus fertilizer (P_2O_5) and potassium (K_2O) and its effect on the numerical density of *Aphis Fabea* Scopoli shows the results as well that the reaction was given moral differences where 74 and 0.0 kg /ha phosphorus and potassium average 124.9 insects while we find that the average or level 14 and 0.0 kg/ha recorded an average of 92.2 insect.

Where it is noted that the rate decreased and may be due to an increase in the rate of phosphorous fertilization on the basis that potassium is a constant rate in both levels and this corresponds to what he found **Naeem and Sharef (1977)** as well as what was shown on the same fertilizer under different rates of fertilization.

To determine which of the fertilizers the test area responsible for increasing numerical density studied an interaction between different fertilizers nitrogen (N), phosphorus (P_2O_5) and potassium (K_2O).

The results as ben there are moral differences between the levels of fertilization 144:0.30 kg / ha phosphorus, potassium, nitrogen respectively and the gravel for the average insect 65.0 insects while i was given the reaction 74:144:0.0g / ha 133.0 insect. The high increase may be due to the change in rates, in particular the low rate of nitrogen fertilizer as well as phosphorous fertilizer.

The results of interference and variation in fertilization rates and their effect on the density of the lesion is consistent with some studies on the effect of nitrogen fertilizers and phosphorous on some types of legumes and cotton as well as peas as shown by the studies of **Naeem & Sharef (1977) and Zytoko (2006**) under the influence of different rates and levels of fertilization for the plant).

The results of the chemical analysis of the elements showed a decrease in the proportion of nitrogen, as well as protein in the local rolling class, compared to other varieties characterized by high levels of nitrogen and protein, and is consistent with previous studies of both **Mustafa and Samara (1999)** as well as, **Naeem and Sharaf (1977)**.

The results here show that there is a correlation between the numerical density of bean and the concentration of nitrogen and protein or in the chemical content of the plant.

That fluctuation of the numerical density of those under the influence of different fertilizers and rates and levels studied may be due to the action of fertilizers and not due to the activity and action of natural enemies in the field of study where some types of predators and intruders were identified but

in very small numbers do not think that they reach the level of reducing the numerical density of the pest.

Female weight of beans (*Aphis fabae* Scopoli)

The plant is affected by nutrition, which plays a big role in its growth and development, and on the other hand it is also affected by the nutrition of the plant in its aspects of life from its reproduction and development and vital activity.

The relationship between the effect of fertilizers and their different levels on the plant has been studied in all stages of its growth and the effect on the lesion of black beans in many aspects.

To increase the emphasis of the effect of fertilizers and their different rates on black man from, the weight of females and the effect of levels of fertilization with nitrogen, phosphorus and potassium were studied during the season 2005-2006 p where the results showed that there are moral differences between levels of fertilization Different d where I was given 60 nitrogen kg / ha highest average female weight which amounted to 1.050 milligrams followed by 30 nitrogen kg /ha which was given an average of 0.750 milligrams while phosphorus recorded 74 kg /ha 0.588 milligrams the lowest average female weights.

The results of the study suggest that the weight has increased at the rate of nitrogen 60kg /ha, 0.0 in both phosphorus and potassium and this may be due to the fact that nitrogen is an essential element in the feeding of the pest, which reflected positively on its weight and this does not differ with what he mentioned **(Al-Mukhtar, 2001)** as well as his mention **(Eid *et al.*, 1988).**

In another study that corresponds to the current study, **Mustafa and Samara (1999)** explained that there is a positive correlation between the length of the insect's life, the increase in weight and the rates of nitrogen and protein in the leaves of the Syrian large grain plant Syrian Local Large may return to the increase in the weight of the This is consistent with what he found **(Mustafa and Samara, 1999)** on the same insect that found that there is a positive correlation between the weights of nymphs and mothers when fed on nitrogen and protein. The weight of the lesion may also depend on the amount of nutrients containing nitrogen and carbohydrates, especially sucrose in the leaves of the bean plant, where it acts as a nutrient.

Weight nymphs of black bean (*Aphis Fabae* Scopoli)

To study fertilizers and their different levels and levels on the weight of nymphs for an insect of beans, three nitrogen fertilizers (N), potassium (K_2O) and phosphorus (P_2O_5) were tested where the results recorded that there is a moral fur at the probability of 0.5% analysis The contrast where the best level of fertilization was at 30 and 60 nitrogen kg/ha which was given an average weight of 0.338 - 0.400 milligrams respectively, while the weights decreased when the increase in potassium fertilizer was 144 kg /ha which was given an average of 0.213 milligrams. The results show that the best fertilization rate was 30 and 60 kg/ha of nitrogen. The recorded results of nymphs confirm the results on females and their average weights, which showed the best type of fertilizer is nitrogen followed by phosphorus at different levels.

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