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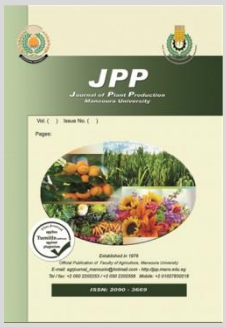
# Beneficial Effects of Compost Manure, Nitrogen and Phosphorus Fertilizer on Green Onion Yield in Relation to Thrips Insects Population

**Gehan Z. Mohamed[1] ; A. I. Aly[2] and A. Y. Zaki[3*]**

[1]Cross Pollinated Vegetables Research Department. Horticulture Research Institute . ARC. Egypt
[2]Vegetable Research Department, Horticulture Research Institute, Agricultural Research Centre, Dokii, Giza, Egypt.
[3]Vegetable and Aromatic Plant Mites Department, Plant Protection Research Institute, Agricultural Research Centre, Dokii, Giza, Egypt.




## ABSTRACT

This study was conducted to investigated the effect of compost and rates of nitrogen (50, 70 and 90 units / fed) and phosphorus (30, 45 and 60 units/ fed) and their interaction on the growth and yield of green onions in Fayoum Governorate during the winter season. 2016/2017 and 2017/2018.The data showed that the addition of organic fertilizer resulted in a significant increase in all studied traits, whether vegetative growth, total green yield / fed and TSS Regarding to amounts of of N,P and K in the leaves. It noticed that, the interaction effect of compost with gradual rates N and P fertilizers resulted in significant gradual increases. It also explained that the increase of nitrogen rates led to a significant increase in all the studied traits except the TSS which decreased by increasing nitrogen. The results showed a significant increase in all the studied traits by increasing the phosphorus. The best result was organic fertilization with the lowest nitrogen and the highest phosphorus.It is clear from the study that organic fertilization with increased rate of nitrogen and phosphorus leads to increase the growth as well as the green yield of onions except TSS, which decrease the increase rate of nitrogen fertilization. As for the thrips population, the results showed no significant differences in the thrips population count for the individual effects of each factor of the study separately, but the results showed that there was a significant effect of the interaction between the studied factors

***Keywords:*** green onion – compost manure – thrips- nitrogen – nitrogen – phosphorus – yield.

## INTRODUCTION

There are 300 species of onion (*Alliumcepa L*) within the genus. Green onions today are most often *Allium fistulosum* and are further classified into four taxonomic groups. Green onion are in the same family as commonly raised vegetables including garlic chives, shallots and of course the bulb onion. Green onion is also known as scallions. Although true scallions are identified by the fact that the sides of the base are straight, whereas the green onions usually slightly curved, showing the beginning of a bulb. Green onion tend to be milder tasting than bulb onions and are typically used raw in salads or diced in soup, salsa and sauces eaten more for flavor and enhancing flavor of other foods, row green onions are better nutritionally than those that are cooked

The important of using organic fertilizers and decrease using chemical fertilizer in green onion production is one of the important ways in health production and another advantages it improves soil structure and the water holding capacities of sandy soils (Naeem *et al* 2006 and Dauda *et al* 2008)

On the other hand, mineral nitrogen fertilizer was found essential and plays important role on the green onion yield (gunjan*et al* 2005). Also the application of phosphorus caused a greet effect on plant growth, total yield and its physical and chemical properties all of them were obtained with onion plant (Aisha *et al* 2007)

Onion thrips (*Thrip)* is an example that exacts both direct and indirect effects on its host, onion (*Allium cepa* L.). Severe infestations of onion thrips can account for substantial onion yield reductions if unmanaged **(**Nault and Shelton 2008; Rueda *et al*., 2007). As a direct pest, onion thrips adults and larvae feed on onion leaves, decreasing photosynthetic potential, and thereby reducing bulb size (Boateng*et al*., 2014). Vegetative growth of onion plants and minerals uptake and increased with increasing nutrients like P2O5 and N that affect the infestation of *T. tabaci* (Malik *et al*., 2009; Bandi and Sivasubramanian, 2012).

The aim of this study was to investigate the application of compost, levels of N, P on the productivity and thrips insects of onion plant.

## MATERIALS AND METHODS

**a. Experimental design:**

Two experiments were carried out during the two winter seasons of 2017 and 2018 at Ibshway, Fayoum Governorate. The objectives of this investigation to study the effect of combinations between compost manure and nitrogen levels (50,7o and 90 unit/fed.)as well as phosphors levels on Giza 20 onion ( *Allium cepa* )cultivar growth and total green yield .

Soil sample from experimental site was taken before transplanting and subjected to analysis, soil physical properties were determined according to klute (1986). Chemicals properties were determined according to Page *et al*., (1982). P was determined according to Chapman and Pratt (1961). The farm soil type was clay salty soil and Table 1 shows the physical and chemical properties of the experimental soil.

* **Corresponding author.**
**E-mail address: ayzaki1975@yahoo.com**
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**Table 1. Some initial physical and chemical soil properties of the studied soil (0-30)**

| Physical properties | | Chemical properties | |
|---|---|---|---|
| $CaCo_3$ % | 4 | PH (1:2.5 soil: water susp) | 7.9 |
| Clay % | 45.40 | $Ca^{++}$ | 6.25 |
| Salt % | 35.5 | $Mg^{++}$ | 6.2 |
| Sand% | 16.8 | $Na^{+}$ | 8.80 |
| Textural class | Clay | Soluble anions meq/L | |
| | | $Hco_3$ | 2.1 |
| | | Cl | 7.70 |
| | | $So_4$ | 11.6 |
| | | Available nutrients ppm | |
| | | N | 50 |
| | | P | 4.6 |
| | | K | 1.75 |

The experimental design was split -split plot; treatments were arranged in a complete randomized block design with three replicates. The main plots were devoted for the two organic fertilizers i.e. 3.5,zero ton/fed of compost (factor A),While nitrogen(Ammonium nitrate) fertilizer were broadcasted at the rate of 50, 70 and 90 unit/fed were randomly distributed in sub plots (factor B)and phosphors levels i.e. 30, 45 and 60 unit/fed were allotted in sub-sub plot(factor C). Compost manure, phosphors levels treatment and potassium sulphate (48% K2o) at rate of 48 unit/fed were added during soil preparation before transplanting. Nitrogen fertilizer treatments were divided into two equal parts. Unit experimental area was 3 m2 1m width and 3m length it contained four plantation rows 25 cm apart. Onion seedlings *Allium cepa* Alliaceae) (Giza 20) produced by Ega-seed company were transplanted in5 cm apart at the end week of November 2017. The normal agricultural practices required for onion production were applied as commonly followed.

**Compost analysis**

Chemical properties of these compost was determined according to Westerman (1990) and are presented in Table (2).

**Table 2. Some chemical properties of the used organic compost in 2016 / 17 and 2017 / 18 seasons.**

| season | N % | P% | K% | Ca% | Mg% | c/n ratio | Fe ppm | Mn ppm |
|---|---|---|---|---|---|---|---|---|
| 2016/ 17 | 0.98 | 1.35 | 1.70 | 5.36 | 0.65 | 11.1 | 4118 | 341 |
| 2017/ 18 | 1.07 | 1.20 | 1.83 | 6.11 | 0.70 | 12.7 | 4326 | 390 |

**b- Data recorded**

**1-Vegetative growth characteristics :-**

Six random plants from each sub-sub-plot after 45 days from transplanting were chosen and cut off at ground level. Plant length/cm, Plant diameter/cm, Number of leaves/plant and fresh and dry weight (gm/plant) were recorded.

**2-Total green yield and its quality**

Total yield (ton/fed.): Total weight of onion plants including the damaged and disorder plants. The green yield harvested after 70 days from transplanting.

**3. Regarding total soluble solids (TSS %):-**

Total soluble solid (%) was determined using a handrefractometer.

**4- Number of *Thrip*:**

Five plants of onion were randomly selected from each plot till the digging of the crops; leaves were investigated every ten days in early morning by using 30X hand lens. Numbers of onion thrips, Thripstabaci were recorded.

**5- Chemical composition:**

Stem sample separately was taken from each sub-sub-plot after 40 days from transplanting, cut into small pieces and then washed with tap water, then rewashed three times with distilled water and dried at 70 oC in a forced air-oven till the weight became stable. The dried samples were ground in a Wiley mill to pass 30 mesh screen and the following data were measured :Total nitrogen(%) was measured using micro-kjeldahl apparatus according to the method described in A.O.A.C. (1965).

Phosphorus (%) was calorimetrically determined, using the ammonium molybdate stannous chloride method as outlined in A.O.A.C. (1965).

Potassium (%) was determined using a wet digestion and atomic absorption spectrophotometer according to Chapman and Pratt (1961).

**c. Statistical analysis:**

All collected data were statistically analyzed according by "MSTAT-C" computer software package. The differences among treatment means were compared by LSD test at $P \leq 0.05$ (Gomez and Gomez 1983).

## RESULTS AND DISCUSSION

**A-Vegetative growth characteristics:-**

**1-Effect of compost:-**

Data on vegetative growth parameters, i.e. Plant length, plant diameter, number of leaves, fresh and dry weight per plant- for the organic manure under different nitrogen levels and phosphorus levels were presented in Table (3). Data show that, there were significant differences in most studied plant growth characteristics among two different treatments. In this respect 100% compost recorded the highest values in plant length (74.037cm-69.63cm) in the two seasons, respectively compared with zero compost. Organic manure rate of 100% increase plant diameter (1.66 cm-1.49cm), number of leaves (12.519- 11.667), fresh(69.130gm-74.19gm) and dry weight (5.402gm-4.571gm) per plant in the two seasons, respectively. Obtained results may be attributed to increasing the rate of organic compost which led to increase the roots and release the mineral with soil. These results are in agreement with those obtained by Rukmowati and Dyah (2017); Al- Fraihat (2016); Adeyeye As et al (2017) and Muhammad*et al* (2015) . These results may be due to the fact that the decomposition of organic matter decreased the PH value and consequently nutrients in the soil became more available to plant hence enhancing plant growth. Organic manures activitaus many species of living organisms which release phytochromes and may stimulate the plant growth and absorption of nutrients (Arish*et al.* 2003) The results showed that increasing the rate of addition of nitrogen fertilizer leads to increased growth characteristics studied

**Table 3. Effect of compost (100%),control (zero compost), nitrogen and phosphorus fertilizer levels on vegetative growth, yield and fruit quality of green onion plants during two seasons.**

| treatments | Plant length cm | | Plant diameter cm | | Number of leaves per plant | | Fresh weight/gm/ plant | | Dry weight/gm/ plant | | Total yield/Ton /Fed | | Total Soluble solids % | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| compost | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| 100% | 74.037 | 69.630 | 1.66 | 1.49 | 12.519 | 11.667 | 69.130 | 74.190 | 5.402 | 4.571 | 4.839 | 5.194 | 4.574 | 4.578 |
| zero | 72.741 | 68.815 | 1.43 | 1.3 | 11.333 | 10.296 | 67.948 | 64.576 | 5.285 | 4.555 | 4.811 | 4.509 | 4.319 | 4.363 |
| Lsd 5% | 0.384 | 0.451 | 0.014 | 0.033 | 0.133 | 0.134 | 0.650 | 0.773 | 0.045 | 0.104 | 0.106 | 0.291 | 0.021 | 0.032 |
| N | | | | | | | | | | | | | | |
| 50 | 70.278 | 64.944 | 1.34 | 1.27 | 10.167 | 9.000 | 50.005 | 52.272 | 4.128 | 3.456 | 3.499 | 3.659 | 4.628 | 4.672 |
| 70 | 73.833 | 69.611 | 1.49 | 1.39 | 11.889 | 11.111 | 70.197 | 70.397 | 5.410 | 4.804 | 4.913 | 4.917 | 4.406 | 4.467 |
| 90 | 76.056 | 73.111 | 1.8 | 1.53 | 13.722 | 12.833 | 85.414 | 85.479 | 6.493 | 5.429 | 6.061 | 5.978 | 4.306 | 4.272 |
| Lsd 5% | 0.249 | 0.207 | 0.042 | 0.014 | 0.149 | 0.103 | 0.401 | 0.533 | 0.007 | 0.04 | 0.315 | 0.226 | 0.041 | 0.019 |
| P | | | | | | | | | | | | | | |
| 30 | 72.500 | 67.944 | 1.52 | 1.36 | 11.500 | 10.444 | 64.411 | 67.019 | 4,944 | 4.382 | 4.508 | 4.69 | 4.400 | 4.422 |
| 45 | 73.444 | 69.500 | 1.54 | 1.4 | 11.833 | 11.056 | 68.260 | 69.079 | 5.251 | 4.581 | 4.861 | 4.825 | 4.428 | 4.444 |
| 60 | 74.222 | 70.222 | 1.57 | 1.43 | 12,444 | 11.444 | 72.945 | 72.051 | 5.836 | 4.727 | 5.106 | 5.038 | 4.511 | 4.544 |
| Lsd 5% | 0.104 | 0.129 | 0.015 | 0.015 | 0.064 | 0.082 | 0.310 | 0.249 | 0.063 | 0.018 | 0.239 | 0.106 | 0.007 | 0.015 |

**2- Effect of nitrogen levels:-**

Data in Table (3) show the progressive relationship between nitrogen levels and onion plant growth parameters. The results showed that increasing the rate of nitrogen fertilizer addition leads to increase the growth characteristics studied i.e. plant length plant diameter, number of leaves, fresh and dry weight per plant. The results were heavily similar in the two seasons of the experiment. The increase of plant growth by increasing nitrogen levels might be due to its role in photosynthesis, protein synthesis, cell division and enlargement which are the basal steps of plant growth, in addition, nitrogen plays an important role in the enzyme activity which reflects more products needed in plant growth

Some investigators showed the same trend (Al-Fraihat2016) on onion- Abou El Magd et al 2014- Diriba-shiferow 2014- Patel and Patel 2012 on Garlic)

**3- Effect of phosphorus levels:-**

Increasing phosphorus fertilizer level led to increased the vegetative growth of onion plants expressed as plant length(74.222cm-70.222cm), plant diameter (1.57cm-1.43cm), number of leaves (12.444-11.444), fresh (72.945gm-72.051gm) and dry weight (5.836gm-4.727gm) per plant as showed in Table (3) .These increases were statistically significant and similar in the two seasons of the experiment. Many investigators reported that, phosphorus increased growth of onion plants (Altet al 1999).

The increase in the vegetative growth of onion plants by phosphorus might be due to the effect of P- application on plant growth could be explained through the role of phosphorus which is extremely important as a structural part of many components notably nucleic acid and phospholipids. In addition phosphorus on indispensable role in energy of hydrolysis of phosphate being used to induce chemical reaction.

**Effect of interactions :-**

The combined effect of compost and nitrogen levels increased the vegetative growth of onion plant Table (4).

Plant length (76.667cm-75.00cm), plant diameter (1.9cm-1.82cm), number of leaves(14.667-13.556), fresh(88.027gm-92.278gm) and dry(6.593gm-5.431gm) weight per plant were obtained by 100% compost and nitrogen 90 k.gm

**Table 4. Effect of the interaction between compost and nitrogen fertilizer levels on vegetative growth, yield and quality of green onion plants during two seasons.**

| Treatments | | Plant length/ cm | | Plant diameter/ cm | | No. of leaves/plant | | Fresh weight/gm/ plant | | Dry weight/gm/ plant | | Total yield/Ton /Fed | | Total soluble solids% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compost | Nitrogen | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| | 50 | 70.778 | 65.889 | 1.4 | 1.38 | 10.556 | 9.556 | 49.638 | 57.376 | 3.948 | 3.498 | 3.874 | 4.016 | 4.733 | 4.833 |
| 100% | 70 | 74.667 | 70.000 | 1.6 | 1.48 | 12.333 | 11.889 | 69.723 | 72.917 | 5.666 | 4.870 | 4.881 | 5.706 | 4.644 | 4.556 |
| | 90 | 76.667 | 75.000 | 1.9 | 1.82 | 14.667 | 13.556 | 88.027 | 92.278 | 6.593 | 5.431 | 6.16 | 6.459 | 4.544 | 4.444 |
| | 50 | 69.778 | 64.000 | 1.2 | 1.17 | 9.778 | 8.444 | 50.372 | 47.168 | 4.308 | 3.413 | 3.225 | 3.301 | 4.322 | 4.378 |
| Zero% | 70 | 73.000 | 69.222 | 1.3 | 1.28 | 11.444 | 10.333 | 70.670 | 67.878 | 5.154 | 4.739 | 3.946 | 4.728 | 4.267 | 4.211 |
| | 90 | 75.444 | 73.222 | 1.4 | 1.45 | 12.778 | 12.111 | 82.801 | 78.681 | 6.392 | 5.428 | 5.062 | 5.496 | 4.167 | 4.200 |
| Lsd 5% | | 0.628 | 0.415 | 0.084 | 0.028 | 0.299 | 0.206 | 0.802 | 1.067 | 0.146 | 0.08 | 0.632 | 0.453 | 0.082 | 0.038 |

The interaction between compost and phosphorus levels were showed in Table (5) .Data cleared that, higher levels of phosphorus and zero level of organic recorded significantly vegetative growth plant length (74.889cm-70.556cm), plant diameter (1.68cm-1.53cm), number of leaves (13.111-12.222), fresh (72.651gm-77.914gm) and dry (6.593gm – 5.431gm) weight per plant in the two season respectively. This is due to the N and P that promotes the development of the vegetative parts. These results are in an agreement with those obtained by Ali *et al* (2008).

In Table (6) the combined effect of nitrogen and phosphorus levels was found significant for vegetative growth parameters significantly higher vegetative growth was recorded (plant length 76.667cm-73.833cm) (plant diameter 1.83cm-1.58 cm), (number of leaves 14.333-13.167), (fresh weight per plant 90.18-88.498 gm), (dry weight per plant 6.917-5.597 gm) in the two seasons respectively. These results are in agreement with those obtained by (Aliyu *et al* 2007)

**Table 5. Effect of the interaction between compost and phosphorus fertilizer levels on vegetative growth, yield and quality of green onion plants during two seasons.**

| Treatments | | Plant length cm | | Plant cmdiameter | | No. of leaves/plant | | Fresh weight/gm/ plant | | Dry weight/gm/ plant | | Total yield/Ton /Fed | | Total soluble solids% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compost | Phosphorus | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| | 30 | 73.111 | 68.444 | 1.64 | 1.47 | 12.000 | 11.000 | 65.052 | 70.883 | 4.353 | 5.021 | 4.944 | 4.961 | 4.522 | 4.522 |
| 100% | 45 | 74.111 | 69.889 | 1.65 | 1.48 | 12.444 | 11.778 | 69.67 | 73.772 | 4.569 | 5.294 | 5.552 | 5.167 | 4.556 | 4.556 |
| | 60 | 74.889 | 70.556 | 1.68 | 1.53 | 13.111 | 12.222 | 72.651 | 77.914 | 4.792 | 5.891 | 5.968 | 5.454 | 4.644 | 4.656 |
| | 30 | 71.889 | 67.444 | 1.41 | 1.25 | 11.000 | 9.889 | 63.770 | 63.154 | 4.211 | 4.867 | 4.262 | 4.420 | 4.278 | 4.322 |
| Zero% | 45 | 72.778 | 69.111 | 1.43 | 1.32 | 11.222 | 10.333 | 66.834 | 64.386 | 4.392 | 5.207 | 4.344 | 4.483 | 4.300 | 4.333 |
| | 60 | 73.556 | 69.889 | 1.45 | 1.34 | 11.778 | 10.667 | 70.239 | 66.187 | 4.561 | 5.681 | 4.526 | 4.621 | 4.378 | 4.544 |
| Lsd 5% | | 0.209 | 0.259 | 0.032 | 0.03 | 0.128 | 0.164 | 0.62 | 0.498 | 0.126 | 0.035 | 0.479 | 0.213 | 0.014 | 0.031 |

**Table 6. Effect of the interaction between nitrogen and phosphorus fertilizer levels on vegetative growth, yield and quality of green onion plants during two seasons**

| Treatments | | Plant length plant/cm | | Plant diameter cm/ | | No. of leaves/plant | | Fresh weight/gm/ plant | | Dry weight/gm/ plant | | Total yield/Ton /Fed | | Total soluble solids% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen | Phosphorus | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| 50 | 30 | 69.000 | 63.500 | 1.32 | 1.25 | 9.833 | 8500. | 46.972 | 50.005 | 3.675 | 3.312 | 3.187 | 3.15 | 4.600 | 4.613 |
| 50 | 45 | 70.333 | 65.167 | 1.34 | 1.31 | 10.167 | 9.000 | 49.287 | 52.392 | 3.965 | 3.472 | 3.529 | 3.467 | 4.600 | 4.650 |
| 50 | 60 | 71.500 | 66.167 | 1.37 | 1.36 | 10.500 | 9.500 | 53.757 | 54.418 | 4.743 | 3.583 | 3.862 | 3.809 | 4.683 | 4.733 |
| 70 | 30 | 73.167 | 68.167 | 1.47 | 1.38 | 11.400 | 10.500 | 65.283 | 68.388 | 4.925 | 4.560 | 4.568 | 4.487 | 4.367 | 4.433 |
| 70 | 45 | 73.833 | 70.000 | 1.48 | 1.41 | 11.667 | 11.167 | 70.410 | 69.568 | 5.457 | 4.853 | 4.928 | 4.808 | 4.383 | 4.433 |
| 70 | 60 | 74.500 | 70.667 | 1.51 | 1.42 | 12.500 | 11.667 | 74.898 | 73.235 | 5.848 | 5.000 | 5.303 | 5.126 | 4.467 | 4.533 |
| 90 | 30 | 75.333 | 72.167 | 1.78 | 1.48 | 13.167 | 12.333 | 80.978 | 82.663 | 6.232 | 5.275 | 5.66 | 5.514 | 4.233 | 4.230 |
| 90 | 45 | 76.167 | 73.333 | 1.8 | 1.53 | 13.667 | 13.000 | 85.083 | 85.277 | 6.530 | 5.417 | 6.205 | 5.670 | 4.300 | 4.237 |
| 90 | 60 | 76.667 | 73.833 | 1.83 | 1.58 | 14.333 | 13.167 | 90.180 | 88.498 | 6.917 | 5.597 | 6.532 | 6.478 | 4.383 | 4.241 |
| Lsd 5% | | 0.314 | 0.388 | 0.049 | 0.046 | 0.192 | 0.247 | 0.931 | 0.747 | 0.189 | 0.053 | 0.312 | 0.319 | 0.021 | 0.031 |

The results of interaction between experimental factors i.e. compost, nitrogen and phosphorus fertilization as affected by onion plant are given in Table (7) .Data cleared that the triple interactions between high level N , high level P and adding compost or no adding gave the highest growth values and was more significantly than other treatments in two seasons. These results are in agreement with those obtained by (Aisha *et al* 2007)

**Table 7. Effect of the interaction between compost , nitrogen and phosphorus fertilizer levels on vegetative growth, yield and quality of green onion plants during two seasons**

| Treatments | | | Plant length plant/cm | | Plant c/diameter m | | No.of Leaves/plant | | Fresh weight/gm/ plant | | Dry weight/gm/ plant | | Total yield/Ton /Fed | | Total Soluble solids% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compost | Nitrogen | Phosphorus | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| | 50 | 30 | 69.333 | 64.000 | 1.4 | 1.35 | 10.333 | 8.667 | 48.450 | 53.307 | 3.603 | 3.207 | 3.391 | 3.731 | 4.700 | 4.800 |
| | 50 | 45 | 70.667 | 66.333 | 1.44 | 1.35 | 10.667 | 9.667 | 49.700 | 57.670 | 3.877 | 3.450 | 3.478 | 4.043 | 4.700 | 4.800 |
| | 50 | 60 | 72.333 | 67.333 | 1.46 | 1.43 | 10.667 | 10.333 | 50.763 | 61.060 | 4.363 | 3.583 | 3.553 | 4.273 | 4.800 | 4.900 |
| | 70 | 30 | 74.000 | 69.000 | 1.6 | 1.46 | 11.667 | 11.333 | 63.920 | 70.733 | 4.997 | 4.583 | 4.473 | 4.951 | 4.500 | 4.467 |
| 100% | 70 | 45 | 75.000 | 70.333 | 1.61 | 1.5 | 12.000 | 12.000 | 71.053 | 71.447 | 5.820 | 4.890 | 4.973 | 5.007 | 4.533 | 4.533 |
| | 70 | 60 | 75.000 | 70.667 | 1.66 | 1.5 | 13.333 | 12.333 | 74.200 | 76.570 | 6.180 | 5.133 | 5.196 | 5.36 | 4.600 | 4.667 |
| | 90 | 30 | 76.000 | 72.333 | 1.89 | 1.58 | 14.000 | 13.000 | 82.787 | 88.610 | 6.463 | 5.267 | 5.779 | 6.20 | 4.367 | 4.300 |
| | 90 | 45 | 76.667 | 73.000 | 1.9 | 1.6 | 14.667 | 13.667 | 88.303 | 92.110 | 6.187 | 5.367 | 6.181 | 6.45 | 4.433 | 4.333 |
| | 90 | 60 | 77.333 | 75.667 | 1.93 | 1.66 | 15.333 | 14.000 | 92.990 | 96.113 | 7.130 | 5.660 | 6.583 | 6.728 | 4.533 | 4.400 |

**Follow table 7. Effect of the interaction between compost, nitrogen and phosphorus fertilizer levels on vegetative growth, yield and quality of green onion plants during two seasons**

| Treatments | | | Plant length plant/cm | | Plant diameter cm/ | | No. of leaves /plant | | Fresh weight/gm/ plant | | Dry weight/gm plant | | Total yield/Ton /Fed | | Total Soluble solids% | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Compost | Nitrogen | Phosphorus | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| | 50 | 30 | 68.667 | 63.000 | 1.23 | 1.15 | 9.333 | 8.333 | 45.493 | 46.703 | 3.747 | 3.417 | 3.183 | 3.268 | 4.100 | 4.467 |
| | 50 | 45 | 70.000 | 64.000 | 1.24 | 1.17 | 9.667 | 8.333 | 48.873 | 47.023 | 4.053 | 3.493 | 3.42 | 3.291 | 4,100 | 4.400 |
| | 50 | 60 | 70.667 | 65.000 | 1.27 | 1.18 | 10.333 | 8.667 | 56.750 | 47.777 | 5.123 | 3.583 | 3.971 | 3.344 | 4.067 | 4.467 |
| | 70 | 30 | 72.333 | 67.333 | 1.34 | 1.24 | 11.333 | 9.667 | 66.647 | 66.043 | 4.517 | 4.533 | 4.663 | 4.623 | 4.033 | 4.400 |
| zero | 70 | 45 | 72.667 | 69.607 | 1.36 | 1.32 | 11.333 | 10.333 | 69.767 | 67.690 | 5.093 | 4.817 | 4.882 | 4.668 | 4.033 | 4.128 |
| | 70 | 60 | 74.000 | 69.662 | 1.35 | 1.32 | 11.667 | 11.000 | 75.597 | 69.900 | 5.517 | 4.867 | 5.291 | 4.892 | 4.011 | 4.100 |
| | 90 | 30 | 74.667 | 71.000 | 1.65 | 1.37 | 12.333 | 11.667 | 79.170 | 76.717 | 6.000 | 5.283 | 5.541 | 5.369 | 4.005 | 4.100 |
| | 90 | 45 | 75.667 | 71.667 | 1.7 | 1.46 | 12.667 | 12.333 | 81.863 | 78.443 | 6.473 | 5.467 | 6.23 | 5.491 | 4.007 | 4.100 |
| | 90 | 60 | 76.000 | 73.000 | 1.73 | 1.51 | 13.333 | 12.333 | 87.370 | 80.883 | 6.703 | 5.533 | 6.115 | 5.628 | 4.003 | 4.033 |
| Lsd 5% | | | 0.628 | 0.777 | 0.134 | 0.092 | 0.385 | 0.495 | 1.862 | 1.495 | 0.379 | 0.11 | 0.438 | 0.639 | 0.43 | 0.092 |

**B-Total green yield and quality**

**1-Effect of compost**

Table (3) revealed an increment of total green yield due to applying organic compost (100%) in both seasons .The reason behind the increment of yield may be that, the addition of organic fertilizers leaded to the increment of vegetative growth. The data expressed that, 4.839 -5.194 ton/fed respectively.

**2- Effect of nitrogen fertilization**

The analysis of variance indicated that, N significantly improved total yield of onion as presented in Table (3).

Application of N at rate of 90N kg/fed improved the total green yield by about 36.371-35.868 ton / fed in the two seasons, respectively as compared with adding 50 kg N /fed (4.811- 4.509 ton/fed) This positive response may be due to the role of N in promoting the growth of onion plant because nitrogen plays important role in leaf production via its role in vegetative growth and it reflected on the yield (Abdissa, et al 2011; Khan et al 2002 and Geries et al. 2012).

**3-Effect of phosphorus**

In Table (3) the trend of levels phosphorus application had positive effect on total green yield onion plant. The highest yield per fed was found by adding 60unit P2O5 /fed (5.106 -5.038 ton/fed) in the two seasons, respectively. Similar results were obtained by (Alt et al 1999)

**Effect of Interaction:**

Data in Table (4) showed the interaction effect of between compost and nitrogen on green yield. Obtained data cleared that significantly maximum green yield were obtained with adding 100% compost and 90 kg N/fed, it has led to an increase in yield (6.16-6.459 ton /fed) in the two seasons respectively, that might be due to the synergistic effect of nitrogen and compost. Similar results were reported by (Al-Fraihat2016)

Interaction effect between compost and phosphorus on yield is showed in Table (5). Data revealed the superiority of applying the highest rates of organic and phosphorus in two seasons (5.968- 5.454 ton/ fed) ,respectively

Data in Table (6) showed that interaction effect between Nitrogen and Phosphorus on yield. The obtained data deduced that increased onion yield (6.532. – 6.478 ton/ fed) with adding 60 unit Phosphorus and 90 unit Nitrogen / fed (60-90) in the two seasons, respectively. These obtained result agreed with those reported by Aliyu et al (2007).

Table (7) showed that interaction effect between compost, nitrogen and phosphorus on green yield onion. Data cleared that significant increases in total green yield as result of combined application of compost , high level of nitrogen(90 unit/ fed) and high level of phosphorus(60 unit/fed ) (6.583 - 6.728 ton/fed ) in the two seasons, respectively.

Applying organic matter plus mineral may be due to more availability of most of the essential plant nutrients. Similar result were attained by (Mouna et al 2013) and Rizk et al 2014) they recorded the highest yield of onion bulbs and was obtained by the combination of organic with inorganic fertilizers

**C. Total Soluble Solids (TSS %):-**

**1-Effect of compost:**

Table (3) showed effect of adding compost on TSS. Data obtained showed that, adding compost led to significantly increase on TSS compared with without compost in tow growing seasons. These results are in accordance with those obtained by (Saad *et al* 2018) by using 50% compost + 50% vermicompost.

**2-Effect of nitrogen levels**

In Table (3) application of little level (50 kg N/fed) of N significantly increased plant Tss in onion when compared with the other N levels (70-90 kg N/fed) in two seasons (4.628%-4.672%) respectively. These results are in agreement with Abdelkader and Shimaa (2016).

**3- Effect of phosphorus levels**

Increasing application of P fertilizers led to increasing TSS in onion plant (4.511%-4.544%)in two growing seasons respectively. The results were similar in the two seasons of the experiment Table (3), some investigators showed the same trend (Yogita and Ram ,2012)

**4- Effect of the interaction:-**

Data in Table (4) cleared that interaction between compost and nitrogen fertilization had significantly effect TSS of onion The combined effect of compost and low nitrogen levels increased in the TSS of onion (Table 4) compared with the control and the highest level of compost and nitrogen which recorded the low levels.

The combined of compost and phosphorus in Table (5) levels significantly increased TSS in onion plant (4.664%-4.656%)

The combined of nitrogen and phosphorus in Table (5) showed that, low level nitrogen+ high level of phosphorus significantly increased TSS in onion plant. The data recorded (4.683%-4.733%) in the two seasons respectively.

The combined of compost, Nitrogen and phosphorus in Table(6) showed that, compost+ low levels of nitrogen+ high levels of phosphorus recorded the highest values of TSS in onion plant (4.8%-4.9%) compared with the other treatments

**D- Chemical analysis:-**

Results of the plant leaves analysis for N,Pand K contents (%) are listed in Table (8) .

**1-Effect of manure compost:**

The treatment of organic fertilizer gave significant increased N,P and K contents (%) for the two seasons. These mean that, organic manure fertilizer are very suitable for nutrition of green onion plants. These results were done in response to the actions of microorganisms on organic compost material and its transformation processing. (Geries *et al* 2012).

**2-Effect of nitrogen and phosphorus levels:**

The N,P and K (%) uptake were significantly increased with increasing of N and P application rates. for the two seasons. This may be due to that, total nitrogen fixation might be increased by increasing the available phosphorus in the soil which released by phosphate solubilization and mineralization process caused by the phosphate dissolving bacteria.

**3- Effect of the interaction:-**

The data in Table (8) showed that, the interaction between the compost and mineral (N,P)fertilizers were significantly increased the uptake of N,P and K. The best treatment was obtained at the application rates of nitrogen 90 unit/fed and phosphorus 60 unit/fed plus organic compost. May be due to both more balanced C/N ratio and more availability of most of the essential plant nutrients in compost. This results agreement with ( Mouna *et al*. 2013).

**Table 8. Means and interaction between compost and mineral fertilizers on (N,P and K ) of green onion plants during two seasons.**

| Treatments | Characters | | | | | |
|---|---|---|---|---|---|---|
| | N | | P | | K | |
| | 1st | 2nd | 1st | 2nd | 1st | 2nd |
| Manure | | | | | | |
| Compost (C1) | 1.819 | 1.751 | 0.137 | 0.133 | 1.453 | 1.348 |
| Without compost (C2) | 1.724 | 1.678 | 0.133 | 0.128 | 1.352 | 1.275 |
| LSD (5%) | 0.014 | 0.048 | 0.003 | 0.003 | 0.075 | 0.053 |
| Nitrogen (N) | | | | | | |
| $N_1$ | 1.673 | 1.589 | 0.130 | 0.128 | 1.283 | 1.222 |
| $N_2$ | 1.754 | 1.713 | 0.136 | 0.131 | 1.413 | 1.297 |
| $N_3$ | 1.887 | 1.841 | 0.140 | 0.135 | 1.511 | 1.416 |
| LSD (5%) | 0.054 | 0.085 | 0.003 | 0.003 | 0.057 | 0.037 |
| Phosphor (P) | | | | | | |
| $P_1$ | 1.747 | 1.697 | 0.133 | 0.129 | 1.366 | 1.277 |
| $P_2$ | 1.772 | 1.713 | 0.135 | 0.131 | 1.408 | 1.309 |
| $P_3$ | 1.794 | 1.734 | 0.138 | 0.132 | 1.434 | 1.349 |
| LSD (5%) | 0.0195 | 0.006 | 0.002 | 0.003 | 0.038 | 0.029 |
| Interaction: C*N | | | | | | |
| $C_1 \times N_1$ | 1.722 | 1.626 | 0.132 | 0.128 | 1.317 | 1.251 |
| $C_1 \times N_2$ | 1.778 | 1.738 | 0.138 | 0.134 | 1.472 | 1.336 |
| $C_1 \times N_3$ | 1.957 | 1.890 | 0.142 | 0.138 | 1.570 | 1.458 |
| $C_2 \times N_1$ | 1.624 | 1.553 | 0.129 | 0.125 | 1.250 | 1.192 |
| $C_2 \times N_2$ | 1.730 | 1.689 | 0.133 | 0.128 | 1.354 | 1.259 |
| $C_2 \times N_3$ | 1.817 | 1.792 | 0.137 | 0.123 | 1.452 | 1.374 |
| LSD (5%) | 0.055 | 0.085 | 0.004 | 0.004 | 0.080 | 0.053 |
| Interaction: N*P | | | | | | |
| $N_1 \times P_1$ | 1.642 | 1.567 | 0.128 | 0.125 | 1.240 | 1.183 |
| $N_1 \times P_2$ | 1.678 | 1.580 | 0.131 | 0.126 | 1.292 | 1.212 |
| $N_1 \times P_3$ | 1.700 | 1.622 | 0.133 | 0.128 | 1.318 | 1.270 |
| $N_2 \times P_1$ | 1.733 | 1.703 | 0.134 | 0.129 | 1.385 | 1.267 |
| $N_2 \times P_2$ | 1.750 | 1.710 | 0.135 | 0.131 | 1.415 | 1.297 |
| $N_2 \times P_3$ | 1.778 | 1.727 | 0.138 | 0.132 | 1.440 | 1.328 |
| $N_3 \times P_1$ | 1.867 | 1.820 | 0.138 | 0.133 | 1.472 | 1.380 |
| $N_3 \times P_2$ | 1.888 | 1.848 | 0.139 | 0.134 | 1.517 | 1.418 |
| $N_3 \times P_3$ | 1.905 | 1.855 | 0.142 | 0.137 | 1.545 | 1.450 |
| LSD (5%) | 0.013 | 0.011 | 0.003 | 0.003 | 0.026 | 0.051 |
| Interaction: C*P | | | | | | |
| $C_1 \times P_1$ | 1.789 | 1.737 | 0.136 | 0.132 | 1.421 | 1.303 |
| $C_1 \times P_2$ | 1.817 | 1.750 | 0.137 | 0.133 | 1.454 | 1.344 |
| $C_1 \times P_3$ | 1.851 | 1.767 | 0.139 | 0.135 | 1.483 | 1.397 |
| $C_2 \times P_1$ | 1.706 | 1.657 | 0.131 | 0.127 | 1.310 | 1.250 |
| $C_2 \times P_2$ | 1.728 | 1.676 | 0.133 | 0.128 | 1.361 | 1.273 |
| $C_2 \times P_3$ | 1.738 | 1.702 | 0.136 | 0.130 | 1.386 | 1.302 |
| LSD (5%) | 0.027 | 0.009 | 0.003 | 0.003 | 0.024 | 0.014 |
| Interaction: C*N*P | | | | | | |
| $C_1 \times N_1 \times P_1$ | 1.677 | 1.617 | 0.130 | 0.127 | 1.267 | 1.200 |
| $C_1 \times N_1 \times P_2$ | 1.727 | 1.613 | 0.132 | 0.128 | 1.320 | 1.237 |
| $C_1 \times N_1 \times P_3$ | 1.763 | 1.647 | 0.134 | 0.129 | 1.363 | 1.317 |
| $C_1 \times N_2 \times P_1$ | 1.760 | 1.727 | 0.137 | 0.132 | 1.453 | 1.297 |
| $C_1 \times N_2 \times P_2$ | 1.763 | 1.737 | 0.137 | 0.134 | 1.473 | 1.337 |
| $C_1 \times N_2 \times P_3$ | 1.810 | 1.750 | 0.140 | 0.136 | 1.490 | 1.373 |
| $C_1 \times N_3 \times P_1$ | 1.920 | 1.867 | 0.141 | 0.137 | 1.543 | 1.413 |
| $C_1 \times N_3 \times P_2$ | 1.960 | 1.900 | 0.141 | 0.138 | 1.570 | 1.460 |
| $C_1 \times N_3 \times P_3$ | 1.999 | 1.903 | 0.144 | 0.139 | 1.597 | 1.500 |
| $C_2 \times N_1 \times P_1$ | 1.607 | 1.517 | 0.125 | 0.124 | 1.213 | 1.167 |
| $C_2 \times N_1 \times P_2$ | 1.630 | 1.547 | 0.130 | 0.125 | 1.263 | 1.187 |
| $C_2 \times N_1 \times P_3$ | 1.637 | 1.597 | 0.131 | 0.126 | 1.273 | 1.223 |
| $C_2 \times N_2 \times P_1$ | 1.707 | 1.680 | 0.131 | 0.127 | 1.317 | 1.237 |
| $C_2 \times N_2 \times P_2$ | 1.737 | 1.683 | 0.133 | 0.128 | 1.357 | 1.257 |
| $C_2 \times N_2 \times P_3$ | 1.747 | 1.703 | 0.136 | 0.129 | 1.390 | 1.283 |
| $C_2 \times N_3 \times P_1$ | 1.803 | 1.773 | 0.135 | 0.130 | 1.400 | 1.347 |
| $C_2 \times N_3 \times P_2$ | 1.817 | 1.797 | 0.136 | 0.131 | 1.463 | 1.377 |
| $C_2 \times N_3 \times P_3$ | 1.830 | 1.807 | 0.141 | 0.134 | 1.493 | 1.400 |
| LSD (5%) | 0.037 | 0.016 | 0.005 | 0.005 | 0.093 | 0.073 |

**D- Effect on *Thrip*:**

**1-Effect of manure compost:**

Table (9) shows that number of Thrips on leaves was no affected significant by manures but the highest number of pest was in compost manure ($C_1$) in both seasons.

**2-Effect of nitrogen levels:**

Data in table (9) indicated that was no affected significant effect by added levels nitrogen fertilizers ($N_1$, $N_2$ and $N_3$) where the highest number of pests in season 1 and season 2 were 21.59 &21.29 individuals in $N_3$.

**Effect of phosphorus:-**

From Table (9), it is also clear that there was significantly increment by added levels phosphorus fertilizers ($P_1$, $P_2$ and $P_3$) where the highest number of *Thrip* in season 1 and season 2 were 22.83 & 22.53 individuals in $P_2$.

**Interaction effect between manure and nitrogen levels:**

Data of Table (9) showed that the main effect of interaction between manure and nitrogen fertilization on number of *Thrip* was high significant. The highest number in both seasons was (26.08 and 25.78 indv.) in interaction between manure and nitrogen fertilizer ($N_3$).

**Interaction effect between nitrogen and phosphorus levels:**

Table (9) shows that number of *Thrip* was significantly by effect of interaction effect between nitrogen and phosphorus fertilization but the highest number of pests was (24.09 & 23.79) in interaction between nitrogen level and phosphorus level ($N_1P_2$) in both seasons.

**Interaction effect between manure and phosphorus levels:**

The data tabulated in table (9) showed that the main effect of interaction between manure and phosphorus fertilization on number of *Thrip* was high significant in both seasons. The highest number of pest in both seasons was (27.67 and 27.37 indv.) in interaction between manure and phosphorus fertilization ($C_1P_2$).

**Interaction effect between manure, Nitrogen and phosphorus levels:**

Data in table (9) indicated that there was significantly increment by added manure, nitrogen and phosphorus fertilizers where the highest number of *Thips* in both seasons were (28.72 & 28.42 indv.) in interaction between manure, nitrogrn and phosphorus fertilization ($C_1N_3P_3$).

Draz *et al.* (2013) studied the effect of different rates of Nitrogen (N) fertilizer (80, 120, 160 and 200 N units/feddan) on population density of piercing sucking insect pests on tomato plants. Rates of nitrogen fertilizer showed high significant effect on populations' densities for each of *B. tabaci* nymphs, *E. decipiens* and *T. tabaci*. Where, rates of 80 and 120 units of nitrogen fertilizer showed lowest level of population densities for those pests.

Malik *et al.* (2009) found that low (50 kg N/ha) and optimum (150 kg N/ha) amounts of nitrogen applied to soil had no effect on abundance of thrips, although abundance of thrips (7.6 per plant) decreased at 150 kg of nitrogen per hectare. The maximum abundance of thrips (13 per plant) was observed with high rates of nitrogen (200 and 250 kg/ha).

**Table 9. Effect of compost manure, N and P fertilizer applied on number of *Thrips tabaci* insects**

| Treatments | Characters: Pests | |
|---|---|---|
| | Season 1 | Season 2 |
| Manure | | |
| Compost (C1) | 16.33a | 16.03a |
| Without compost (C2) | 25.48a | 25.18a |
| LSD (5%) | NS | NS |
| Nitrogen (N) | | |
| $N_1$ | 19.05a | 19.67a |
| $N_2$ | 19.14a | 20.84a |
| $N_3$ | 21.59a | 21.29a |
| LSD (5%) | NS | NS |
| Phosphor (P) | | |
| $P_1$ | 22.83b | 22.53a |
| $P_2$ | 20.22a | 19.92b |
| $P_3$ | 19.66ab | 19.36b |
| LSD (5%) | NS | NS |
| Interaction: C*N | | |
| $C_1 \times N_1$ | 24.92a | 24.62a |
| $C_1 \times N_2$ | 25.43a | 25.13a |
| $C_1 \times N_3$ | 26.08a | 25.78a |
| $C_2 \times N_1$ | 15.03b | 14.73b |
| $C_2 \times N_2$ | 16.85b | 16.55b |
| $C_2 \times N_3$ | 17.10b | 16.80b |
| LSD (5%) | 4.69 | 4.69 |
| Interaction: N*P | | |
| $N_1 \times P_1$ | 24.09a | 23.79a |
| $N_1 \times P_2$ | 22.17a | 21.87a |
| $N_1 \times P_3$ | 17.15b | 16.85a |
| $N_2 \times P_1$ | 23.05a | 22.75a |
| $N_2 \times P_2$ | 19.76ab | 16.85b |
| $N_2 \times P_3$ | 17.11b | 16.81b |
| $N_3 \times P_1$ | 23.73a | 23.43a |
| $N_3 \times P_2$ | 21.33ab | 21.03ab |
| $N_3 \times P_3$ | 19.71ab | 19.41ab |
| LSD (5%) | 4.59 | 4.59 |
| Interaction: C*P | | |
| $C_1 \times P_1$ | 17.98c | 17.68c |
| $C_1 \times P_2$ | 15.54c | 15.24c |
| $C_1 \times P_3$ | 15.46c | 15.16c |
| $C_2 \times P_1$ | 27.67a | 27.37a |
| $C_2 \times P_2$ | 24.89ab | 24.59ab |
| $C_2 \times P_3$ | 23.87b | 23.57b |
| LSD (5%) | 3.75 | 3.75 |
| Interaction: C*N*P | | |
| $C_1 \times N_1 \times P_1$ | 14.94g | 14.64fg |
| $C_1 \times N_1 \times P_2$ | 12.94g | 12.64fg |
| $C_1 \times N_1 \times P_3$ | 21.86g | 12.58g |
| $C_1 \times N_2 \times P_1$ | 17.28fg | 16.98fg |
| $C_1 \times N_2 \times P_2$ | 16.92fg | 16.62fg |
| $C_1 \times N_2 \times P_3$ | 16.40fg | 15.34fg |
| $C_1 \times N_3 \times P_1$ | 19.74cdef | 19.44cdef |
| $C_1 \times N_3 \times P_2$ | 18.24defg | 18.44defg |
| $C_1 \times N_3 \times P_3$ | 17.88efg | 17.58efg |
| $C_2 \times N_1 \times P_1$ | 23.78abcde | 24.28abcde |
| $C_2 \times N_1 \times P_2$ | 21.37bcdef | 21.07bcdef |
| $C_2 \times N_1 \times P_3$ | 21.36bcdef | 21.07bcdef |
| $C_2 \times N_2 \times P_1$ | 26.46ab | 26.16ab |
| $C_2 \times N_2 \times P_2$ | 25.74abc | 25.44abc |
| $C_2 \times N_2 \times P_3$ | 24.58abcd | 24.48abcde |
| $C_2 \times N_3 \times P_1$ | 28.83a | 28.53a |
| $C_2 \times N_3 \times P_2$ | 28.72a | 28.42a |
| $C_2 \times N_3 \times P_3$ | 28.45a | 28.15a |
| LSD (5%) | 6.49 | 6.49 |

Moraiet and Ansari (2015) determined the effect of three levels of fertilizers; phosphorus ($P_2O_5$), i.e., 20, 40, 80 kg/ha and nitrogen (N) ,i.e., 60, 80 and 100 kg/h against onion thrips, *Thripi* on onion cultivars; Phosphorus and nitrogen doses was no different significantly on density of thrips but different significant on yield of cultivars.

## REFERENCES


Abd-Elkader,D and Shimaa,M,Hassan (2016).Influence of different fertilization and harvest time on growth, head characters and nutrition quality of Endive under sandy soil.*American Journal of plant physiology. 11(1-3) :* 23-32,2016.

Al-Fraihat, A. H. (2016). Impact of different fertilizer sources on vegetative growth yield quality and storability of onion. *International Invention Journal of Agriculturaland Soil Science*, 4(1): 1-8.

Abdissa,Y., T. Tekalign and L.M.Pant (2011) Growth, bulb yield and quality of onion (*Allium cepa L.*) as influenced by nitrogen and phosphorus fertilization on vertisoll Growth attributes, biomass production and bulb yield. *African Journal of Agriculture Research Vol. 6 (14), pp. 3252-3258, 18 July, 2011.*

AbouEl-Magd, M. M., M. F. Zaki, S.A. AbouSedara and T.T.El-Shorbagy (2014).Evaluation of five Garlic (*Alliumsativum* L.) cultivars under Bio-chemical and mineral fertilization. *Middle East Journal of Agriculture Research,* 3 (4): 926-935.

Adeyeye, As., M.A Ishaku, H.O. Gadu, K.K. Olalekan and W.A .Lamid (2017). Compa-rative effect of organic and inorganic fertilizer treatments on the growth andyield onion (*Allium cepa*L.). *Journal of Botanical Sciences*, 6: 8-11.

Aisha,A.H., fatma,A.Rizk,A.M. Shaheen and Mona, M.A.Abdel-Mouty (2007). Onion plant Growth, bulbs yield and its physical and chemical properties as affected by organic and natural fertilization. Research Journal of Biological Sciences, 3(5):380-388.

Ali, U.K., M.N. Alam, M.S. Islam, M.K. Islam and N.A. Baree (2008). Effect of cow-dung at different level of phosphorus on growth, yield and quality seed produ-ction of onion. *Research Journal of Agriculture and Biological Sciences*. 4(1):86-93

Aliyu,U., M,D.M.Magaji., A,Singh and S,G.Mohamed (2007). Growth and yield of onion *(Allium cepa L.)* as Influenced by nitrogen and phosphorus levels. *International Journal of Agricultural Research, 2 : 937- 944.*

Alt, D., Ladebusch, H. and Melzer, O. 1999. Long-term trial with increasing amounts of phosphorus, potassium and magnesium applied to vegetable crops. ActaHorticulturae 506: 29–36.

Arish, H. M. E., A.A. Gad and S. E. Younes (2003). Response of some pepper cultivars to organic and mineral nitrogen fertilizer under sandy soil conditions. *Zagazig JournalAgriculture Research*, 30: 1875 – 1899.

Bandi, S.M. Sivasubramanian, P. (2012). Role of induced host plant resistance in the management of Thripstabaci Lindeman (Thripide: Thysanoptera) in onion. Agric. Sci. Dig. 32: 219-223.

Boateng, C.O., Schwartz, H.F., Havey, M.J and Otto, K., 2014. Evaluation of onion germplasm for resistance to Iris yellow spot (Iris yellow spot virus) and onion thrips, Thripstabaci. Southw. Entomol. 39, 237–260. http://dx.doi.org/10.3958/059.039.0218.

Chapman, H.D and Pratt, P.F. 1961. Methods of analysis for soil, plants and water. Calf. Univ., U.S.A.

Dauda, S. N., F.A. Ajaui and E. Nader (2008). Growth and yield of watermelon(*CitrullusLanatus*) as affected by poultry manure application. *Journal ofAgriculture and Socia.Science.*4: 121-124.

Diriba – Shiferaw, G., R.I. Nigussie, K. woldetsadik, G. Tabor and J.J. Sharma (2014). Bulb quality of Garlic (*Allium sativum*L.) as influenced by the applicationof inorganic fertilizers. *African Journal of Agriculture Research*, 9 (8): 778-790.

Draz, Kh.A.A.; Darwish, A.A.E. and Tabikha, R.M.M. (2013). Effect of Different Rates of Nitrogen Fertilizer on Infestation Level with Piercing Sucking insect Pests of Tomato Crop, Lycoperisiconesculentum L. J.Agric. &Env. Sci. Dam.Univ.,Egypt. Vol.12 (3)

Geries,L.S.M.,E.S.Elgizawy,A.M.A.Abo-Dahab and S.S.Karam (2012). Productivity and Quality of two onion cultivars under organic, slow release and mineral fertilizers..*Plant production, Mansoura Univ., Vol. 3 (5): 835- 846, 2012.*

Gomez, K. A. and Gomez, A. A. 1983. Statistical Procedures for Agricultural Research, 2nd edition, John Wiley & Sons, New York, USA.

Gunjan, A., R. Paliwal and D. K. Sarolia (2005). Effect of Nitrogen and bio-fertilizer on yield and quality of rabi-onion (*Allium cepal*) CV. puna red. *Agriculture Sciences Digest*, 25 (2): 124-126.

Khan,H., M.Iqbal,A.Ghaffoor and K.Waseem (2002). Effect of various plant spacing and different Nitrogen levels on the growth and yield of onion. *Onion J.Biol.Sci.,2:545.*

Klute, A. 1986. Methods of soil analysis part 1-2nd ed., Amer. Soc. of agron., madieon, Wisconsin, U.S.A.

Malik, M. F.; Nawaz, M.; Ellington, J.; Sanderson, R. and El-Heneidy, A. H. (2009). Effect of Different Nitrogen Regimes on Onion Thrips, *Thripstabaci*Lindemann, on Onions, *Allium cepa* L. Southwestern Entomologist, 34(3):219-225.

Moraiet, M. A. and Ansari, M. S. (2015) Effect of fertilization on onion thrips, Thripstabaci Lindeman on onion crop. Basic Research Journal of Agricultural Science and Review. 5(2) pp. 46-55

Mouna, M.; Wafa, S.; Khaled, I.; Azaeiz, G.; and Mohamed, B.K. 2013. Evaluating pre-crops and organic fertilizers for effects on soil properties and organic onion growth and yield in eastern Tunisia. Conférence Internationale des Energies Renouvelables (CIER), 2(13)

Muhammad, F., A.H. Shah, A.A. Malik, N. Ali, U. Khan, A. Majid and H.Ahmad. (2015). Nutrient management for improving onion productivity. *American-Eurasian J. Agricand Environ. Sci.,* 15 (2): 220 – 225.

Naeem, M., J. Iqbal and M. A. A. Bakhash (2006). Comparative study of inorganic fertilizers and organic manures on yield and yield components of mungbean (*Vigna radiate* L.). *J. Agric. Soc. Sci.,* 2: 227 – 229.

Nault, B.A and Shelton, A.M., 2008. Insecticide efficacy and timing of spray for onion thrips control.Proceedings, 2008 Empire Sate Fruit and Vegetable Expo, 12–14 February 2008. Syracuse, NY. PP. 12-14.

Rizk, F. A.; Shaheen, A.M.; Abd El-Samad, E.H. and El-Labban, T.T. 2014. Response of onion plants to organic fertilizer and foliar spraying of some micro-nutrients under sandy soil conditions. Journal of Applied Science Research, 10(5): 383-392

Rueda, A., Badenes-Perez and F.R., Shelton, A.M., 2007. Developing economic thresholds for onion thrips in Honduras. Crop Prot. 26, 1099–1107. http://dx.doi.org/10.1016/j. cropro.2006.10.002. SAS Institute, 2012. SAS/STAT Version 9.4. SAS Institute, Cary, NC.

Rukmowati, R.R.B. and Dyah, A. 2017. Application of Granular Organic Fertilizer to Improve Yield of Red Onion. Int'l Journal of Advances in Agricultural & Environmental Engg. (IJAAEE) Vol. 4, Issue1, ISSN 2349-1523 EISSN 2349-1531. https://doi.org/10.15242/IJAAEE.C0317010

Page, A.L.; Miller R. H. and Keeney, D.R. 1982. Methods of soil analysis. Part-2, Amer. Soc. of agron., madieon, Wisconsin, U.S.A.

Patel, P. B. and J. J. Patel. (2012). Impact of different nitrogen levels and irrigation intervals on incidence of thrips (*Thripstabacilindman*)infesting garlic. *AgyesAnInte-rnational e- Journal,* 1 (3): 287 – 292.

Saad,A.E., H,G.El-mehrat., A,A.Ragab and A,M.A.Abou-Dahab (2018). Growth, yield, bulb quality and storability of some onion cultivars response to compost, vermicompost and plant growth promoting Rizobacteria. Middle East Journal of Agriculture Research, Volume : 07- Issue:02- April – June – 2018- pages : 292 – 306.

Westerman, R.L.(1990). Soil Testing and Plant Analysis.( 3rd ed) Soil Science Society of America, Inc. Madison Wisconsin, USA.

Yogita and R,B.Ran. (2012). Effect of chemical and bio fertilizers on quality of onion. *Hortflora Research Spectrum, 1(4) : 367- 370.*

## التاثيرات المفيدة لاسمدة الكمبوست والنيتروجين و الفوسفور علي محصول البصل الاخضر و علاقتها باعداد التربس

**جيهان زينهم محمد[1] ، احمد ابراهيم علي[2] و ايمن يوسف محمد[3]**

**[1]قسم بحوث الخضر خلطية التلقيح – معهد بحوث البساتين**

**[2]قسم بحوث الخضر ذاتية التلقيح – معهد بحوث البساتين2**

**[3]قسم بحوث الاكاروس – معهد وقاية النبات**

اجري هذا البحث لدراسة تأثير التسميد العضوي باضافة المعدل الموصي به من الكمبوست ومعدلات مختلفة من كل من النتروجين (50 و70 و 90 وحدة /فدان) والفوسفور (30 و45 و60 وحدة /فدان) و التفاعل بينهما على نمو ومحصول البصل الاخضر وذلك بمركز ابشواي بمحافظة الفيوم خلال الموسمين الشتويين لعامي 2016 / 2017 و 2017 / 2018. وقدبينت النتائج المتحصل عليها ان اضافة السماد العضوي ادي الي زيادة معنوية في كافة الصفات المدروسة سواء النمو الخضري (الطول - القطر- الوزن الطازج - الوزن الجاف / نبات – محتوي الاوراق من النتروجين والفوسفور و البوتاسيوم ) او المحصول الكلي للفدان و المواد الصلبة الكلية . كما اوضحت ان زياة معدلات التسميد النتروجيني ادت الي زيادة معنوية في كافة الصفات المدروسة ماعدا المواد الذائبة الكلية التي نقصت بزيادة التسميد الازوتي - كما بينت النتائج زيادة معنوية في كافة الصفات المدروسة بزيادة معدل التسميد الفوسفاتي تاثيرا معنويا وكان للتفاعل بين عوامل الدراسة (الكمبوست وكل من معدلات التسميد الازوتي والتسميد الفوسفاتي ) وكانت اعلي البيانات المسجلة باضافة الكمبوست و90 وحدة ازوت 60 وحدة فوسفور و ذلك لكل الصفات المدروسة ماعدا المواد الصلبة الذائبة الكلية التي كانت افضل نتيجة لها بالتسميد العضوي مع اقل معدل من السماد الازوتي واضافة اعلي معدل من السماد الفوسفاتي (60 وحدة - ويتضح من الدراسة ان التسميد العضوي بالكمبوست مع زيادة معدل التسميد المعدني لكل من الازوت والفوسفور تؤدى الي زيادة معدل النمو وكذا المحصول الكلي للبصل ماعدا المواد الصلبة الذائبة الكلية التى تقل بزيادة معدل التسميد الازوتي .- وبالنسبة لتعداد التربس فلم تظهر النتائج اي فروق معنوية فى تعداد حشرة التربس للتأثيرات المنفردة لكل عامل من عوامل الدراسة علي حدة ولكن اظهرت النتائج ان هناك تاثير معنوي للتفاعل بين عوامل الدراسة (التفاعل بين الكمبوست و النتروجين و التفاعل بين الكبوست والفوسفور و التفاعل بين الفوسفور و النتروجين والتفاعل بين الكمبوست والنتروجين والفوسفور ) – ولذلك يوصي البحث باستخدام الكمبوست مع التسميد النتروجيني والفوسفاتي بمعدل 90 و60 وحدة /فدان علي الترتيب