

# Effects of ammonium nitrate on the growth and yield of different plant tomato (*Lycopersicon esculentum*)

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**ABSTRACT:** To study the effect of ammonium nitrate on the growth and yield of tomato plants cv Kljy experiment in a completely randomized design with three replications. The five levels of zero, 50, 100, 150 and 200 mg per kg of soil was used. Factors examined included: number of flowers and fruits, vitamin C, total acidity, pH, chlorophyll index. Results showed that the highest number of goals in the treatment of ammonium nitrate and 50 mg N kg and 200 mg N kg lowest ammonium nitrate treatment, most fruit at the lowest nitrate, 150 and 200 mg N kg nitrate treatment; The use of ammonium nitrate fertilizer in most traits are better than others at 50 and 150 respectively. The results of this study can be concluded that ammonium nitrate growth factors are more effective than reproductive factors and treatments on tomato plant growth will have the desired effect.

**Keywords:** tomato, ammonium nitrate, yield.

## INTRODUCTION

If nitric acid resulting from the oxidation of ammonium to combine again with ammonia, ammonium nitrate is obtained. This fertilizer has 23% nitrogen, ammonia nitrogen, nitrate nitrogen, and hence it is suitable for a wide range of field and horticultural crops. Urea fertilizer is the closest competitor. The Asydzayy can be said that the fertilizer is neutral and does not have much effect on soil acidity. Ammonium nitrate is a chemical, explosive and flammable and prone. Another drawback is that there is a significant amount of water is absorbed. Upon opening the package, so it should be used. These properties can be improved by adding some extra material such as dirt or lime (Ejraei, 2007). Ammonium nitrate is produced in Iran, with 26% nitrogen and nitrogen per unit, it is more expensive than urea. Its chemical formula ( $\text{NH}_4\text{NO}_3$ ) is. Nitrate fertilizer is the best fertilizer to the soil surface and land surface disc throw. However, nitrate nitrogen fertilizers due to high degree of dissolution and transfer of the soil, the roots can spread dispersion always above the horizon after dissolving the root to reach the roots will reach (Ejraei, 2007). Tomato plants flowering top of a split order, the family is *Lycopersicon Solonaceae* and sex. Tomatoes (in Persian Afghanistan: Eggplant Roman) with a scientific name *Lycopersicon esculentum* fruit is red and juicy. This plant is native to Central and South America during the Spanish colonial period, was transferred to the rest of the world (khoshkhoy *et al*, 1987). Tomatoes form ammonium nitrate to form it prefers. Potassium chloride consumption to grow and flowering time (at least 4 times) to make the most of. At the time of fruiting plants can be used as Svlvptas rate of 10 kilograms per hectare of soil and water from irrigation or spraying the plants and the potassium Dfandr than 2 liters per thousand liters of water a plant needs potassium to eliminate said. The tomatoes need more fertilizer nitrogen, phosphorus and potassium (khoshkhoy *et al*, 1987). Al-Hindawi *et al* (1997) Experimental effects of different ratios of nitrate and ammonium in the presence or absence of 5 mM bicarbonate medium on yield and chemical composition of tomato examined and ammonium-fed found that plants were fruit yield was 25 % lower than the plants that supply had nitrate and ammonium and nitrate nutrition of plants with a combined ratio of 4 to 1 , causing a 20 % increase in crop yield compared to plants with nitrate supply had been . Increase in bicarbonate medium trigger fruiting plants , but only to the extent of nitrate to ammonium ratio was on . Allen *et al* (1989 ) Effect of ammonium or nitrate on photosynthesis , growth and nitrogen uptake of tomato

cultivar Rio Grande put Tomatoes response to nitrogen sources compared . To this end , early plant growth , concentration, photosynthesis, chlorophyll , carbohydrates , and also the main enzyme involved in the metabolism of nitrogen , including nitrate reductase , nitrite reductase , glutamine synthetase and glutamate dehydrogenase ) were evaluated . Early plant growth , photosynthetic activity , chlorophyll and carbohydrate concentrations are significantly increased. With external ammonium concentration increases , the amount accumulated in the roots . In addition, the protein concentration in roots significantly increased.

### MATERIALS AND METHODS

The experiment was conducted in the city arranged in Fars Province . jahrom city north of the city of Fasa , the West and South of the city Firoozabad , East Darab city from the northwest to the southeast of the city of Shiraz and Lar city limits . City arranged at longitude 53 degrees 33 minutes latitude 28 degrees 30 minutes and 1050 meters above sea level is located . In this study the effects of nitrogen fertilizer ammonium nitrate on the growth and flowering time Klij tomato varieties were studied in a calcareous soil . Thus, ammonia fertilizer was used. Initially selected 60 pots of soil were poured into each 5 kg of tomatoes were planted two seeds in each pot . Then the desired treatment levels of zero, 50 , 100 , 150 and 200 mg per kg of soil nitrogen fertilizer ammonium nitrate were each separately added to each pot . Also supplying potassium and phosphorus content of 80 mg per kg of soil potassium and phosphate and triple super phosphate and potassium sulphate was added to the pot equally . After four leaf emergence and the strongest seedling in each pot was removed and the other left . The amount of irrigation water during the growing period so that the water does not get out of the pots and the soil moisture at field capacity . This research is based on a completely randomized design with 15 treatments and 3 replications. Treatments consisted of 50 , 100 , 150 and 200 mg N per kg soil as a nitrogen fertilizer ( 14 treatments) and a control. Statistical analysis using software MSTAT-C and mean comparison using Duncan 's new multiple range test was performed at 1% grafting reaction.

### RESULTS AND DISCUSSION

#### Number of flower

As can be seen from Table 1.1, the highest number of goals in the treatment of 50 mg N (0/13 goals) than the control and other There were significant increases the levels of ammonium nitrate. The least number of goals in levels of 200 mg of nitrogen in ammonium nitrate treatment (0/3 goals), which had significantly lower levels of ammonium nitrate is 50. Increasing the concentration of ammonium nitrate from zero to 50, leading to an increased number of flowers, but flower number decreased from 50 to 200. This decrease was not significant concentrations of 150 to 200. Significant difference between the concentrations of 150 and 200 were observed.

#### Number of fruit

It comes from the results of Table 1-1, the maximum level of 150 mg N in the treated fruits (7/3 fruit) and the lowest level of 200 mg N in this treatment (7/1 fruit) was found. Increasing the concentration of ammonium nitrate from zero to 150, leading to an increase in the number of fruit, but the fruit was reduced from 150 to 200. In this regard, significant differences between each other and with different concentrations of ammonium nitrate were observed.

Table 1. Comparison of different levels of ammonium nitrate on the characters.

| Ammonium nitrate levels | Control | AN 50  | AN 100 | AN150  | AN 200 |
|-------------------------|---------|--------|--------|--------|--------|
| Traits                  |         |        |        |        |        |
| Number flower           | 5/0c    | 13/0a  | 9/0b   | 4/3c   | 3/0c   |
| Number fruit            | 2/0a    | 2/7a   | 3/0a   | 3/7a   | 1/7a   |
| Vitamin C (mg)          | 39/23b  | 36/60b | 40/19b | 54/27a | 56/33a |
| PH                      | 5/16a   | 4/89b  | 4/58c  | 4/36d  | 4/15e  |
| Chlorophyll Index       | 33/5c   | 43/0b  | 49/1a  | 53/3a  | 48/4a  |

<sup>†</sup>Means in each column having the same letter, have not significant difference ( $P \leq 0.01$ ) according to DMRT. AN: Ammonium nitrate

### ***Vitamin C***

As can be seen from Table 1, the maximum amount of vitamin C, 200 mg of N in these treatments (33/56 mg) and vitamin C as well as the lowest level of 50 mg N in this treatment (60/36 mg), respectively. Ammonium nitrate concentration increases from zero to 50, leading to a non-significant decrease in vitamin C content. The concentration of vitamin C was increased from 50 to 200. Between concentrations of 50 and 100, there was no significant difference. Also, no significant difference was observed between concentrations of 150 and 200.

### ***PH***

The results in Table1 confirmed that the highest pH levels (16/5) than the ammonium nitrate levels have increased significantly. The lowest pH level of 200 mg N in ammonium nitrate treatment (15/4), which is significantly lower than the control. Ammonium nitrate concentration increases from zero to 200 resulted in a significant decrease in pH.

### ***Chlorophyll Index***

As may be drawn from Table 1, the maximum chlorophyll index level of 150 mg N in this treatment (3/53) than the controls and had significantly increased levels of ammonium nitrate. The lowest levels of chlorophyll index (n) (5/33) which is significantly lower than the 150 ammonium nitrate. Ammonium nitrate levels increase from zero to 150, resulting in an increase in chlorophyll index. This increase was significant from 100 to 150. From 150 to 200, non-significant decrease in chlorophyll index.

## **CONCLUSION**

### ***The general conclusions***

For most traits, the use of ammonium nitrate fertilizer levels of 50 and 150 are better than others. The results of this study can be concluded that ammonium nitrate growth factors are more effective than reproductive factors and treatments on tomato plant growth will have the desired effect.

## **REFERENCES**

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