

# Effects of ammonium nitrate and ammonium fertilizer at different levels on the yield of tomato plant

Masome Hozhabryan\* and Sepideh Kazemi

Student Horticulture, Islamic Azad University, jahrom

*Corresponding author:* Masome Hozhabryan

**ABSTRACT:** To investigate the effects of nitrogen fertilizers include ammonia, ammonium nitrate on the yield of tomato plant experiment in a completely randomized design with three replications. Each of the five levels of fertilizers, 50, 100, 150 and 200 mg per kg of soil was used. Factors examined included: number of flowers and fruit yield per plant, vitamin E. In 150, the lowest nitrate treatment in the treatment of 150 mg N kg ammonia and ammonium nitrate 50 and 200 mg per kg of soil was observed. For most traits, the use of ammonium nitrate fertilizer, 100 and 150 are better than other fertilizers. Low levels of ammonia can also use quantitative and qualitative characteristics of tomato fruits per plant and improve the high levels have detrimental effects on plants. The results of this study concluded that nitrogen fertilizers on growth factors and reproductive factors are more effective than all treatments and fertilizers on tomato plant growth will have the desired effect.

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

## INTRODUCTION

Nitrogen (N) is one of the most essential nutrients required by plants and other organisms so that the water plants of the factors in the growth of the plant.

Production of nitrogen fertilizers, nitrogen and hydrogen gases react during which, under the influence of temperature, pressure and catalysts to convert ammonia (NH<sub>3</sub>) is. Ammonia is produced during the reaction of a nitrogen fertilizer that can be used directly or as raw material for the manufacture of fertilizers is another. Ammonia nitrogen by 82 percent, the highest amount of nitrogen fertilizers in many countries is injected directly into the soil as fertilizer due to lack of soil moisture in central Iran and the lack of facilities, less used be. If a CO<sub>2</sub> molecule to combine with ammonia, urea is produced from synthetic fertilizers is the most widely used (Ejraei, 1386). 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, 1386). Ammonium nitrate is produced in Iran, with 26% nitrogen and nitrogen per unit, it is more expensive than urea. Its chemical formula (NH<sub>4</sub>NO<sub>3</sub>) is. Nitrate fertilizer is the best fertilizer to the soil surface and land surface disc throw.

Tomato plants flowering top of a split order, the family is Lyopersicon 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, 1998). 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 .

### MATERIALS AND METHODS

This study was designed to investigate both ammonium nitrate and ammonium nitrogen fertilizer on growth and flowering of tomato varieties Kljy a calcareous soil in a completely randomized design with 9 treatments and 3 replications. Treatments consisted of 50 , 100 , 150 and 200 mg N per kg soil from two types of nitrogen fertilizer ( 8 treatments) and a control. For 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 . 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 . Factors determine the number of fruits per plant yield , vitamin C, respectively. The amount of vitamin C, potassium iodide was measured by titration with iodine . Statistical analysis using MSTAT-C software and mean comparison using Duncan 's new multiple range test was performed at 1% .

### RESULTS AND DISCUSSION

#### Number flower

Average data using Duncan's test at 1% showed the highest number of goals in the nitrate treatment (SGR) 50 mg kg equals ( 0 / 13 goals ) and lowest in the treatment of ammonium nitrate and 200 mg per kg soil number ( 0 / 3 goals ) , respectively. 50 and 150 of treatment ammonia , ammonium nitrate, 150 and 200 were not significantly different . Ammonia treatment with 200 mg per kg of dry soil because the plant was not possible to examine the number of flowers . Increased concentrations of 100 to 150 mg per kg of soil, fertilizer use has led to a significant reduction in the number of flowers (Table 1-1) .

#### Number Fruit

Average data using Duncan's test at 1% nitric acid-treated fruit showed the highest number of 150 and the lowest nitrate treatment, 200 (7/1 fruit) was found. Ammonia treatment of 200 due to the drying plant was not possible to examine the fruit. Concentration increased from 50 to 150 in all fertilizers increased number of fruit, but the fruit was reduced from 150 to 200 (Table 1-1).

#### Yield

Average data using Duncan's test at 1% showed the highest yield of nitrate treatment , 150 ( 9/174 g ) and lowest in the treatment of ammonia , 150 , ammonium nitrate , 50 and 200 (respectively 5/90 , 2 / 83 and 7/99 g ) was observed . Ammonia, ammonium nitrate treatments of 50 and 200 were not significantly different . Ammonia treatment plant at 200 due to the drying plant was not possible to verify the performance . Increases in nitrate concentrations from 50 to 150, but the ammonia leads to increased yield , but the yield was reduced from 150 to 200 . Decrease in the yield of ammonia concentration was 100 onwards ( Table 1.1 ) .

Table 1. Comparison of different treatments on the characteristics of

Treatment	flowers	fruit	yield (g)	Vitamin c (mg)
Control	5/0gh	2/0bcd	114/2hi	39/23fg
Am 50	6/7fg	2/3bcd	115/1hi	46/93cde
Am 100	9/3ef	2/7bc	142/4fg	45/47def
Am 150	5/0gh	3/0bc	90/5j	38/13j
Am 200	0/0i	0/0d	0/0k	0/00h
A N 50	13/0bcd	2/7bc	83/2j	36/60g
AN 100	9/0ef	3/0bc	145/0ef	40/19efg
AN 150	4/3gh	3/7b	174/9d	54/27abc
AN200	3/0hi	1/7bcd	99/7ij	56/33a

Means in each column having the same letter, have not significant difference ( $P \leq 0.01$ ) according to DMRT.

AN: Ammonium nitrate

Am:Ammonia

#### Vitamin C

Average data using Duncan's test at 1% showed the highest amount of vitamin C in the treatment of ammonium nitrate, 200 (33/56 mg) and lowest in the treatment of ammonia to 150 of ammonium nitrate and 50

(respectively 13/38 and 60 / 36 mg) was observed. 100 and 150 of treatment ammonia, ammonium nitrate, 50 and 100 were not significantly different (Table 1.1).

***The general conclusions:***

Be inferred from these results that in most traits, the use of ammonium nitrate fertilizer fertilizers are 100 and 150 are better than others. Low levels of ammonia can also use quantitative and qualitative characteristics of tomato fruits per plant and improve the high levels have detrimental effects on plants. The results of this study concluded that nitrogen fertilizers on growth factors and reproductive factors are more effective on tomato plant growth will have the desired effect.

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