

Effects of ammonium sulphate and urea fertilizers on the growth and yield of tomato

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ABSTRACT: To study the effect of ammonium sulfate and urea fertilizers on growth and yield of tomato plants cv Kljy 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 fruits per plant yield, vitamin C, total acidity, TSS. The results showed that most fruit urea 100 and 150, and the lowest in the treatment of ammonium sulfate, 200 mg of N per kg, the highest yield in the treatment of urea 150 and lowest in the treatment of 150 mg N kg ammonium sulphate 200 mg Zn kg views will. For most traits, the use of nitrogen fertilizer urea sulfate fertilizer is better than 100 and 150. The results of this study concluded that the form of sulfate and urea fertilizers on growth factors and reproductive factors are more effective on tomato plant growth will have the desired effect..

Keywords : tomato, urea, ammonium sulfate, yield.

INTRODUCTION

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). Urea or carbamide an organic compound with the chemical formula $\text{CO}(\text{NH}_2)_2$ is. The molecule has two amine groups (NH_2 -) to a carbonyl group ($-\text{CO}-$) is connected. Urea to ammonia and carbon dioxide in the soil, and the hydrolyzate is converted. More than 90% of the urea in the world to use as a nitrogen fertilizer is produced. Urea 46% N N highest among all solid nitrogenous fertilizers based on urea and lowest cost per unit of nitrogen is transported. Small pearl beads are supplied as urea fertilizer that say sugar (Salardyny, 1973). Urea in water solution, spray or through irrigation systems applications. The solubility of urea is strictly hundred grams of urea per cent of the water is hot. But if its concentrations increased dissolution rate in water is increasingly difficult. The dissolution of urea in water, a process that causes a drop in temperature Andvmtryk when urea is dissolved. Foliar spray of urea on horticultural products can be used at a concentration of 2 to 5 per thousand (Ejraei , 2007). If we combine ammonia with sulfuric acid, ammonium sulfate fertilizer is produced from the best fertilizer for alkaline and calcareous soil conditions are. Cody is the acid soil conditions were very favorable for Iran. As mentioned Ammonium sulfate of ammonia and sulfuric acid is obtained, but it is also a fertilizer byproduct coke industry. Acidza Ammonium sulfate is added to the soil when the soil pH is acidic (Ejraei , 2007). Ammonium sulfate is approximately 21% nitrogen and 24% sulfur and nitrogen unit price of nitrogen fertilizers is one of the most expensive. However, the benefits are due to the substantial amount of it is consumed. A small amount of ammonium sulfate is produced as a byproduct of the steel industry and its deficiency is supplied from abroad (Malakoti , 2008). Tomatoes adequate amounts of nutrients needed to produce fruit. Especially calcium, potassium and nitrogen are important nutrients. Failure to provide these nutrients in sufficient quantity to cause weakening of the plant and reduce fruit quality of tomato are. Tomato phosphate to produce flowers and fruit rooting needs. Excessive intake of phosphorus can produce a lot of flowers to plant tomatoes if you do not have enough branches and leaves, flowers are produced loss. Branches and leaves of tomato production requires the element nitrogen (Sadiq, 1976). Habilb (1988) showed that the use of urea mixed with zeolite and triple superphosphate may be considerable advantage over urea without additives by increasing the formation of NH_4

and NH₃ molecules and retain NH₄ in the soil may be more. Keenney *et al* (1998) Effect of organic and chemical fertilizers on yield and quality of tomato cv Little Chef has investigated and found that the highest fruit yield of 15 tons of chicken manure and 90 kg nitrogen and most of the 20 tons of fruit Chicken manure and 135 kg nitrogen and more than 10 tons of meat into the water with the use of chicken manure and 225 kg per ha, respectively. Akhtari(1391) Effect of Nitrogen Fertilizer on the quantity and quality of radish plants evaluated and found to increase levels of nitrogen significantly increased tuber yield, so that up to 250 kg N ha tuber yield increased but the treatment of 375 kg per hectare yield reduction was observed.

MATERIALS AND METHODS

This study examines two nitrogen fertilizer urea and ammonium sulfate on the growth and flowering of tomato varieties Clji 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, total acidity, TSS, respectively. The amount of ascorbic acid and total acid titration method with potassium iodide and iodine in profits, TSS with hand Qndsnj (Rfrktvmtr) were measured. Statistical analysis using MSTAT-C software and mean comparison using Duncan's new multiple range test was performed at 1%..

RESULTS AND DISCUSSION

Number Fruit

Average data using Duncan's test at 1% showed the highest number of fruits treated with urea 100 and 150 (respectively 3/6 and 0/7 fruits) and lowest in treatment, ammonium sulfate, 200 (0/1 fruit) existed. Only urea, 100 and 150 treatments were significantly different from controls. Most of the fruits of urea and ammonium sulfate were the lowest. Concentration increased from 50 to 150 in the case of fertilizers, leading to an increase in the number of fruit, but the fruit was reduced from 150 to 200 (Table 1). The problem with the results obtained by the Manavi fard *et al* (2010) corresponded.

Plant Yield

Average data using Duncan's test at 1% showed the highest yield in the treatment of Urea 150 (5/344 g) and the lowest was observed in the soil treated with ammonium sulfate, 200 mg per kg. The sum of all fertilizers used, the highest yield was observed in the use of urea. Concentration increased from 50 to 150 in all fertilizers leads to increased yield, but the yield was reduced from 150 to 200 (Table 1-1). The results obtained by Delshad *et al* (1968) and Babai *et al* (2010) is consistent.

Table 1. Comparison of different treatments on the characteristics of

Character Treatment	number fruit	plant yield	vitamin c	TSS	Total acid
Urea 50	3/0bc	176/4d	46/93cde	6/77bc	0/431a
Urea 100	6/3a	311/7b	48/48bcd	6/33def	0/640f
Urea 150	7/0a	344/5a	49/90abcd	6/00fg	0/677e
Urea 200	2/3bcd	122/8gh	54/8ab	4/67i	1/01b
AS50	3/0bc	163/6de	39/60fg	6/67bcd	0/431j
AS100	3/0bc	178/6d	39/60fg	6/50cde	0/554h
AS 150	3/3bc	252/9c	47/23cde	5/67g	0/738d
AS 200	1/0cd	89/5j	49/87abcd	4/33ij	1/046a

[†]Means in each column having the same letter, have not significant difference ($P \leq 0.01$) according to DMRT. AS: Ammonium sulfate

Vitamin C

Average data using Duncan's test at 1% showed the highest amount of vitamin C in the treatment of Urea 200 (8/54 mg) and lowest in treatments 50 and 100 ammonium sulfate (respectively 60/39 mg) was (table 4-3). This, along with the results obtained by Heravi *et al* (2005) is consistent.

TSS

Average data using Duncan's test at 1% urea treatment showed the highest TSS 50 (77/6%) and lowest in treatment, ammonium sulfate, 200 (respectively 33/4 per cent) was observed. Increasing the concentration of nitrogen fertilizers leads to a reduction in TSS (Table 1-1). These findings Abdul-Baki et al (1996) did not match.

The total acid

Average data using Duncan's test at 1% showed the highest total acid in the treatment of ammonium sulfate 200 (046/1 mg) and lowest in the treatment of 50 with urea and ammonium sulfate (431/0 mg) was observed. Increasing the concentration of nitrogen fertilizers leads to an increase in total acid (Table 1-1). The results with the findings obtained by Delshad et al (1967) do not match.

CONCLUSION

The general conclusions

Be inferred from these results that in most traits, the use of nitrogen fertilizer, urea, ammonium sulfate was better than 100 and 150. The results of this study concluded that urea and ammonium sulfate on reproductive factors and growth factors are more effective on tomato plant growth will have the desired effect.

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