

SUMMARY

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This study was carried out during (1992/1993) and (1993/1994) seasons in the Experimental Farm of Faculty of Agric. at Moshtohor, Zagazig University, Benha branch. The study included two parts:-

I. Effect of nitrogen fertilizer forms (urea and ammonium sulphate added by two methods:

1. Foliar application:- The treatments were as the following:-

1. Control (the foliage of plants washed by tap water).
2. Urea solution at (2.5 gm./L).
3. Urea solution at (3.7 g./L).
4. Ammonium sulphate solution at (5.75 gm./L).
5. Ammonium sulphate solution at (8.62 gm./L).

2. Soil application: The treatments were as follows:-

1. Control (without fertilizer).
2. Urea at 72 Kg./Feddan (9 gms./plant).
3. Ammonium sulphate at 166 Kg./Feddan (20.8 gms/plant).

II. Effect of Topping:

The treatments were as follows:-

1. Control (untopped plants)
2. Plants topped for once (after 40 days from transplanting date).
3. Plants topped twice (after 40 and 70 days from transplanting date).

Nicotiana rustica and *Nicotiana glauca* plants were treated with these treatments.

The experiment of fertilization:

Foliar application:

1. *Nicotiana rustica*:

1. Plant sprayed by low and high concentrations of urea and ammonium sulphate increased branches number, stem length, stem fresh and dry weight.
2. Spray the nitrogen (in both forms) increase leaf number/plant and leaves fresh and dry weights, and urea concentrations were more effective than, ammonium sulphate concentrations.
3. The leaves measurements for lower, middle and upper leaves increased owing to foliar application, the high level of urea was more effective in this concern.
4. The roots number and root length were affected by nitrogen as foliar application, the high concentration of ammonium sulphate was more effective to increase root length, while the high level of urea increased the roots fresh and dry weight.
5. Foliar application of nitrogen fertilizer clearly increased the leaves content of N,P,K, the high level of nitrogen was of more effect.
6. The two forms of nitrogen fertilizer at the different levels significantly increased the nicotine content and chlorophyll A and B were increased in *Nicotiana rustica* leaves.

2. *Nicotiana glauca*:

1. Spraying the two nitrogen forms increased branches number, plant height and stem fresh and dry weights, especially at 8.62 gms/L ammonium sulphate.

2. Leaves number and leaves fresh and dry weights were increased with both nitrogen fertilizer uses specially at 8.62 gms/L ammonium sulphate.
3. Nitrogen spray increased the measurements of upper, middle and lower leaves, with the two levels of both sources.
4. Spraying *Nicotiana alata* plant by high levels of both nitrogen forms increased the root number while the higher level of urea increase root length, but ammonium sulphate increased the root fresh and dry weight.
5. Leaves contents of N,P,K were increased by spraying both forms of nitrogen fertilizer.
6. All nitrogen spray treatments clearly increased the nicotine content in *Nicotiana alata* plants, compared to control plant. The same trend was noticed with chlorophyll A and B in leaves.

Soil application:

1. *Nicotiana rustica*:

1. Fertilization by urea at the rate of 72 Kg/feddan significantly increased stem length, stem fresh and dry weight, branches number and leaves number.
2. The fertilization by urea or ammonium sulphate increased the leaves fresh and dry weight, there are no significant differences between the two sources of nitrogen in this concern.
3. Urea treatments were superior to increase the leaf measurements of lower, middle and upper leaves over ammonium sulphate treatments.
4. Urea treatments were superior ammonium sulphate to increase, root number, but root length greatly increased by adding ammonium sulphate.
5. Nitrogen as soil addition increased root fresh and dry weight, regardless the form of nitrogen adding.

6. The leaf content of N,P,K significantly increased by adding ammonium sulphate at 166 Kg/feddan.
7. The nicotine content significantly increased by using ammonium sulphate at 166 Kg/feddan.
8. Adding nitrogen by the two forms to soil caused little increase in chlorophyll A and B but the increase was not significant.

2. *Nicotiana alata*:

1. Addition of nitrogen fertilizer increased the branch number/plant, but the branching did not affected by nitrogen forms.
2. Adding nitrogen fertilizer increased the height of plant and stem fresh and dry weight than urea treatment.
3. Addition of nitrogen fertilizer increased the leaves number, leaves fresh and dry weight, also the leaf measurements for upper, middle and lower leaves. The effect of ammonium sulphate was clearer than urea effect.
4. Both nitrogen forms increased root number, roots length and root fresh and dry weight. Urea treatments were superior to increase root number, root fresh and dry weight, while ammonium sulphate treatments were more effective for increasiing root length.
5. Adding urea fertilizer to soil increased the leaf content of N,P,K than ammonium sulphate treatments.
6. The two forms of nitrogen fertilizer increased the nicotine content and chlorophyll A and B in *Nicotiana alata* leaves.

II. Topping Experiment:

1. *Nicotiana rustica*:

1. Topping increased the number of branches, effect of topping was more clearer with topping once than topping twice.

2. Topping decrease plant height the decrease was significant with twice topping treatments.
3. Topping for once during the growth season increased stem fresh and dry weight.
4. Topping treatments increased the leaf number/plant, topping for once recorded the best results in this concern.
5. Topping treatments significantly increased leaves fresh and dry weight in both topping treatments.
6. Topping treatments increased leaf length for lower, middle or upper leaves. Twice topping treatment increased the width of leaves.
7. Topping treatments decreased root number, root length, but increase the root fresh and dry weight, the increase was only significant during the first season.
8. Topping increased the leaf content from N,P,K, topping twice was more superior than topping for once.
9. Topping for twice significantly increased the nicotine content in *Nicotiana rustica* leaves.
10. Topping had a little effect for increasing the chlorophyll content.

2. *Nicotiana alata*:

1. Topping significantly increased number of branches, leaves number per plant. Topping for twice significantly increased the leaves fresh and dry weight for the two seasons.
2. The hight of plant decreased with topping treatments for once or twice.
3. Topping for once or twice increased leaf measurements compered to control for lower, middle and upper leaves.
4. Topping treatments decreased root number and root length, the decrease was more roticable when plants topped for twice than those topped once.

5. Topping significantly decreased root fresh and dry weights, the decrease was higher with plants which topped twice.
6. Topping increased the leaf content of N,P,K, as well as the nicotine content and topping twice recorded the highest percent of nicotine over both topping once or control plants.
7. Topping had also a little effect for increasing the chlorophyll content of leaves.

CONCLUSION

In general it could be concluded that:

From all the previous data, it could be quite concluded that, both sources of nitrogen fertilizer (urea and ammonium sulphate) which applied as foliar or dressing clearly affected the chemical composition in both nicotiana varieties which under- taken. The best response was clearly showed by the high level of urea and ammonium sulphate. Although *Nicotiana rustica* showed more responses for urea application than the other nitrogen source (ammonium sulphate), while the opposite reaction was noticed for *Nicotiana alata*.

Concerning, topping effects, it could clearly concluded that, topping nicotiana plant for twice significantly increased the nicotine and chemical composition of nicotiana leaves.

In order to obtain the highest vegetative growth and nicotine yield in nicotiana leaves it could be advice, to carry out topping process in early stage of plant growth.