Effect of some agricultural treatments on growth and yield of tobacco plants

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SUMMARYThis study was carried out during (1992/1993) and (1993/1994seasons in the Experimental Farm of Faculty of Agric. at Moshtohor,Zagazig University, Benha branch. The study included two parts:-I. Effect of nitro en fertilizer forms urea and ammonium sui hateadded by two methods:1. Foliar application:- The treatments were as the following:-[Control (the foliage of plants washed by tap water).2. Urea solution at (2.5 gm.lL).3. Urea solution at (3.7 g,.IL).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.lplant).3. Ammonium sulphate at 166 Kg./Feddan (20.8 gmslplant).u,Effect of Toppioe,: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 alata plants were treated withthese treatments.The experiment of fertilization:Foliar application:1.Nicotiana rustica:1. Plant sprayed by low and hight concentrations of urea and ammoniumsulphate increased branchs number, stem length, stem fresh and dryweight.2. Spray the nitrogen (in both forms) increase leaf number/plant and leavesfresh and dry weights, and urea concentrations were more effectivethan, ammonium sulphate concentrations.3. The leaves measuremenets for lower, middle and upper leaves increasedowing to foliar application, the high level of urea was more effective inthis concern.4. The roots number and root length were affected by nitrogen as foliarapplication, the high concentration of ammonium sulphate was moreeffective to increase root length, while the high level of urea increassedthe roots fresh and dry weight.5. Foliar application of nitrogen fertilizer clearly increased the leavescontent ofN,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 increasedin Nicotiana rustica leaves.2. Nicotiana alata:1. Spraying the two nitrogen forms increased branches number, plantheight and stem fresh and dry weights, especially at 8.62 gms/Lammonium sulphate.2. Leaves number and leaves fresh and dry weights were increased withboth nitrogen fertilizer uses specially at 8.62 gmslL ammoniumsulphate.3. Nitrogen spray increased the measurements of upper, middle and lowerleaves, with the two levels of both sorces.4. Spraying Nicotiana alata plant by high levels of both nitrogen formsincreased the root number while the higher level of urea increase rootlength, but ammonium sulphate increased the root fresh and dry weight.5. Leaves contents of N,P,K were increased by spraying both forms ofnitrogen fertilizer.6. All nitrogen spray treatments clearly increased the nicotine content inNicotiana alata plants, compared to control plant. The same trend wasnoticed with chlorophyll A and B in leaves.Soil application:1. Nicotiana rustica:1. Fertiliztion by urea at the rate of 72 Kg/feddan significantly increasedstem length, stem fresh and dry wight, branches number and leavesnumber.2. The fertilization by urea or ammonium sulphate increased the leavessfresh and dry weight, there are no significant differences between thetwo sourses of nitrogen in this concern.3. Urea treatments were superior to increase the leaf measurements oflower, middle and upper leaves over ammonium sulphate treatments.4. Urea treatments were superior ammonium sulphate to increase, rootnumber, but root length greatly increased by adding ammoniumsulphate.5. Nitrogen as soil addition increased root fresh and dry weight, regardlessthe form of nitrogen adding.6. The leaf content ofN,P,K significantly increased by adding

ammoniumsulphate at 166 Kglfeddan.7. The nicotine content significantly increased by using ammoniumsulphate at 166 Kg/feddan,8. Adding nitrogen by the two forms to soil caused little increase inchlorophyll A and B but the increase was not significant.2. Nicotiana alata:1. Addition of nitrogen fertilizer increased the branch number/plant. butthe branching did not affected by nitrogen forms.2. Adding nitrogen fertilizer increased the height of plant and stem freshand dry weight than urea treatment.3. Addition of nitrogen fertilizer increased the leaves number. leaves freshand dry weight. also the leaf measurements for upper, middle and lowerleaves. The effect of ammonium sulphate was clearer than urea effect.4. Both nitrogen forms increased root number. roots length and root freshand dry weight. Urea treatments were superior to increase root number,root fresh and dry weight. while ammonium sulphate treatments weremore effective for increasiing root length.5. Adding mea fertilizer to soil increased the leaf content ofN.P.K thanammonium sulphate treatments.6. The two forms of nitrogen fertilizer increased the nicotine content andchlorophyll A and B in Nicotiana alata leaves.n. Topping Experiment:1. Nicotlana rumea:1. Topping increased the number of branches. effect of topping was moreclearer with topping once than topping twice.2. Topping decrease plant height the decrease was significant with twicetopping treatments.3. Topping for once during the growth season increased stem fresh and dryweight.4. Topping treatments increased the leaf number/plant, topping for oncerecorded the best results in this concern.S. Topping treatments significantly increased leaves fresh and dry weightin both topping treatments.6. Topping treatments increased leaf length for lower, middle or upperleaves. Twice topping treatment increased the width of leaves.7. Topping treatments decreased root number, root length, but increase theroot fresh and dry weight, the increase was only significant during thefirst season.8. Topping increased the leaf content from N,P,K, topping twice was moresuperior than topping for once.9. Topping for twice significantly increased the nicotine content inNicotiana 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 perplant. Topping for twice significantly increased the leaves fresh and dryweight 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 tocontrol for lower, middle and upper leaves.4. Topping treatments decreased root number and root length, the decreasewas more roticable when plants topped for twice than those toppedonce.5. Topping significantly decreased root fresh and dry weights, the decreasewas higher with plants which topped twice.6. Topping increased the leaf content of N,P,K, as well as the nicotinecontent and topping twice recorded the highest percent of nicotine overboth topping once or control plants.7. Topping had also a little effect for increasing the chlorophyll content ofleaves.CONCLUSIONIn general it could be concluded that:from all the previous data, it could be quite concluded that, bothsources of nitrogen fertilizer (urea and ammonium sulphate) which appliedas foliar or dressing clearly affected the chemical composition in bothnicotiana varieties which under- taken. The best response was clearlyshowed by the high level of urea and ammonium sulphate. AlthoughNicotiana rustica showed more responses for urea application than theother nitrogen source (ammonium sulphate), while the opposite reactionwas noticed for Nicotiana alata.Concerning, topping effects, it could clearly concluded that, toppingnicotiana plant for twice significantly increased the nicotine and chemicalcomposition of nicotiana leaves.In order to obtain the highest vegetative”growth and nicotine yield innicotiana leaves it could be advice, to carry out topping process in earlystage of plant growth.