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Short Communication

Effect of Compost and NPK on Tobaccocrop at different research stations of Pakistan Tobacco Company

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Abstract

Tobacco crop has a wide commercial value. Different techniques have been used to improve the crop yield of tobacco. This study was designed by emphasis on the comparison of 100% NPK (Nitrogen, Phosphorous and Potassium) with 30% compost and 70% NPK mixture used to grow tobacco. The compost used as soil conditioner. The results indicated that the best yields were obtained in the experimental trial which had compost and NPK. The nicotine percentage was below 2.5 and total sugar percentage was above 10 in all experimental trial.

Keywords: Effect, Compost, NPK, Tobaccocrop, Pakistan, Company.

Introduction

The tobacco crop production is not an easy chore. Each part of tobacco plant plays different and important role as they have complex nature[1]. These major and minor roles of tobacco plant parts have a very wide commercial importance. This crop produces end products with large benefits to consumers. Much research has been done on the breeding and genetics of tobacco crop, the main objective of this study was to develop better and improved quality of tobacco[2].

Many countries produce tobacco and import to others. The techniques of tissue culturing have given a room for the improvement of tobacco. The industrial importance and its historical aspects with the presence distribution in market level have been studied widely. To keep in mind the commercial importance of tobacco the plant scientists are much more interested to increase its crop yield and get better, improved crop. This goal can be achieved by genetic manipulation and different other tissue culturing techniques[3]. The pest resistant crop can be developed by using techniques of genetic engineering.

Many factors affect the growth if tobacco plant. These factors are soil fertility, temperature, pH etc. the most important parameter is the fertility of soil, if a soil contains a good amount of micronutrients and macronutrients and its conditioned well, only then a good yield can be obtained[4]. The addition of compost in soil to condition it helps tobacco to grow well. It enhances the capacity to hold moisture and increases the metabolic mechanism of plant. The Nitrogen, phosphorous and potassium can also be used to provide minerals to tobacco plant; it also results in a good yield. The leaves of tobacco show complex chemistry. This crop can be used as a source of biofuels[5].

Materials and Methods

The quantity of compost used to condition the soil was used up to 30% and it was mixed with 70% NPK (Nitrogen, phosphorous and potassium). The tobacco plant nursery was produced by using an area of 1 marla at research station of Pakistan tobacco company, Punjab Pakistan. These research stations were located in Sialkot, Yarhussain and Mianwali.

The tobacco seeds were spreaded in the area of one marla at appropriate distance, these seeds were covered with a small amount of compost so that the seeds can germinate. After germination of the seeds, they were allowed to grow up to 4 to 6 inch plants and kept in nursey for one month. The vigorous and fine seedlings were collected and transplanted in the field area of one hectare. The leveling and dressing of the one hectare area was done with the help of tractors. After leveling and dressing of land, the soil was covered with 70% NPK and 30% compost. In control 100% NPK used. Total 25 bags of compost and 7 bags of NPK were used in the land preparation. The proper beds of seedlings were prepared at appropriate distance and ploughing was performed. The normal practices of irrigation, hoeing and tilling was done whenever it was required. The harvesting of tobacco leafs was done after 2 months of growth. These collected leafs were further cured and dried for a month. These tobacco leafs were sent to Pakistan Tobacco company for the detection and analysis.

Results and Discussion

The results showed that the good yield was produced by using 30% compost and 70% NPK when compared with control. The overall experiment gave good results. The percentage of nicotine in experimental and control was also good.

It was reported from research that the amount of total sugar is must be above 10% as our results show the satisfactory value of total sugar in experimental trials, it ranges from 12.92 to 20.27. The 20.27 value was given by the treatment located in Sialkot, this variation can be because of the soil difference. The amount of nicotine must be below 2.5 % as our results showed, in all experimental trials the percentage of nicotine was ranging from 1.27-2.24.

Table-1
Comparison of estimated yields of control and experiment trials

Location	Est. Yield of experimental Trial	Est. Yield of control Trial	Specie
Sialkot	2787	2699	SPTG28
Yarhussain	3094	2829	K-399
Mianwali	2989	2933	SPTG28

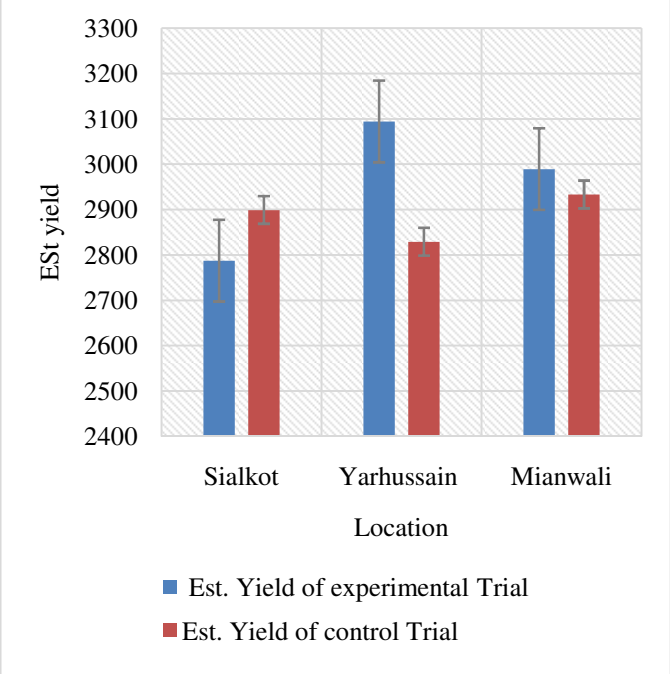

Figure-1
Comparison of estimated yields of control and experiment trials

Table-2
Comparison of Nicotine % of experimental and control trials

Location	Nicotine% experimental Trial	Nicotine% of control Trial	Specie
Sialkot	1.27	1.01	SPTG28
Yarhussain	2.04	1.42	K-399
Mianwali	2.24	2.06	SPTG28

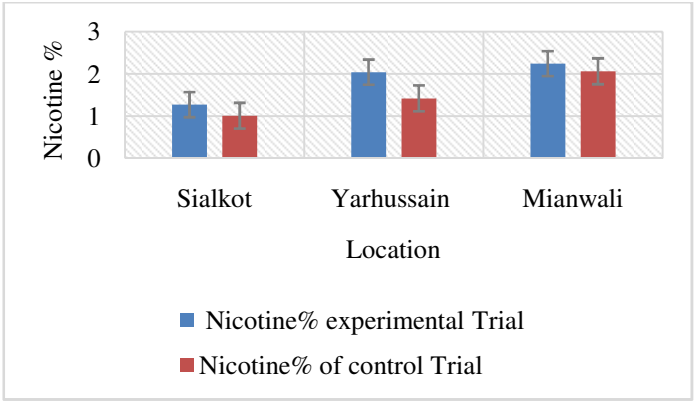

Figure-2
Comparison of Nicotine % of experimental and control trials

Table-3
Comparison of total sugar % in control and experimental trial

Location	T.S% experimental Trial	T.S% of control Trial	Specie
Sialkot	20.27	14.79	SPTG28
Yarhussain	15.09	7.82	K-399
Mianwali	12.92	15.75	SPTG28

The key parameters to check the chemistry of crop yield is to analyse the nicotine and total sugar content and this knowledge is very valuable in industries[6]. Sugars play a vital role in the aromaticity of smoke. The reduction in the total sugar % could be because of the curing period , during curing period the leafs used sugars for their own energy thus decreasing the total sugar The analysis and quantification of these sugars can be used to check the proper curing process[7]. Nicotine is the core compound in tobacco plant[8]. Its metabolism takes place from cotinine[9].

The percentage of nicotine above 2.5 have some dangerous effects on consumers but the results showed nicotine percentage less than 2.5%. The amount of nicotine is widely distributed all over the tobacco plants during growth; initially it is synthesized in roots in large quantity and supplied to different parts[8]. These results showed that the yield was best to be used commercially. Tobacco crop can be growing better in the presence of compost and NPK.

Conclusion

The compost used as soil conditioner. The results indicated that the best yields were obtained in the experimental trial which had compost and NPK. The nicotine percentage was below 2.5 and total sugar percentage was above 10 in all experimental trial.

References

1. Gossett D. R., Millhollon E. P. and Lucas M. (1994). Antioxidant response to NaCl stress in salt-tolerant and salt-sensitive cultivars of cotton. *Crop Science*, 34(3), 706-71.

2. Gharib F. A., Moussa L. A. and Massoud O. N. (2008). Effect of compost and bio-fertilizers on growth, yield and essential oil of sweet marjoram (Majoranahortensis) plant. *Int. J. Agric. Biol*, 10(4), 381-382.

3. Trigiano R. N. and Gray D. J. (1999). Plant tissue culture concepts and laboratory exercises. CRC press.

4. Flowers T. J., Garcia A., Koyama M. and Yeo A. R. (1997). Breeding for salt tolerance in crop plants—the role of molecular biology. *Acta Physiologiae Plantarum*, 19(4), 427-433.

5. Chen J. H. (2006). The combined use of chemical and organic fertilizers and/or biofertilizer for crop growth and soil fertility. International Workshop on Sustained Management of the soil-rhizosphere system for efficient crop production and fertilizer use, Land Development Department Bangkok, Thailand, 16, 20.

6. Russell M. A. H., Wilson C., Patel U. A., Cole P. V. and Feyerabend C. (1973). Comparison of effect on tobacco consumption and carbon monoxide absorption of changing to high and low nicotine cigarettes. *Br Med J*, 4(5891), 512-516.

7. McClure W. F., Norris K. H. and Weeks W. W. (1977). Rapid Spectrophotometric Analysis of the Chemical Composition of Tobacco: Part 1: Total Reducing Sugars. *Beiträgezur Tabakforschung / Contributions to Tobacco Research,* 9(1), 13-18.

8. Dawson R. F. (1942). Nicotine synthesis in excised tobacco roots. *American Journal of Botany*, 813-815.

9. Pianezza M. L., Sellers E. M. and Tyndale R. F. (1998). Nicotine metabolism defect reduces smoking. *Nature*, 393(6687), 750-750, 1.

10. Baldwin I. T. (1988). Short-term damage-induced increases in tobacco alkaloids protect plants. *Oecologia*, 75(3), 367-370.