



# Asian Journal of Plant Sciences

ISSN 1682-3974

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## Effect of NPK Fertilizers and Farmyard Manure on Nut Production of Coconut (*Cocos nucifera* L.)

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**Abstract:** During the present studies it was found that coconut (*Cocos nucifera* L.) had a good response to fertilizers. The maximum yield of 658 nuts was obtained by the application of 700 g Urea+270 g DAP+1600 g MOP. The results also indicated that the application of fertilizers helped to increase nut yield in coconut.

**Key words:** *Cocos nucifera*, NPK, fertilizer, farmyardmanure, nut production

### INTRODUCTION

Coconut (*Cocos nucifera* L.) is a member of the palmae family. The coconut palm is one of the most beautiful and useful palm in the world. It is important in that, it provides a variety of useful products. Every part of the tree is being utilized for some purposes or other, on account of this peculiarity, it is called the tree of heaven, the tree that provides all the necessities of life<sup>[1]</sup>. Coconut is planted in over 11 million ha in more than 85 countries and around 93% of it is found in the Asian and Pacific region<sup>[2]</sup>. The coconut is a very versatile tree. The ideal temperature for coconut growing is usually considered being 29 degree centigrade (27-32°C) with abundant sunshine and a well distributed annual rainfall from 1250 and 2250 mm. It can be grown in deep alluvial soils, which are well drained and can thrive in a wide range of pH from 4 to 9<sup>[1,2]</sup>.

Pakistan has varied agro-ecological conditions suitable to grow various crop commodities. The area near the sea coast has a tropical climate and a number of tropical fruit plants are grown which include coconut as well. Being a new crop it needs enough information to get popularized with the farmers<sup>[3]</sup>. The area of coconut in Sindh Province has increased from 283 to 295 ha during 1994-95 to 1998-99. The production of coconut has increased from 597 tons to 628 tons during the same period. The contribution of the area in Sindh is about 21% and production is 5%, respectively<sup>[4]</sup>.

Fertilizer is the most important and costly input to enhance crop yields. There is no doubt that fertilizers play a very active role in increasing crop yield. Systematic manuring with balanced fertilizer mixtures is an essential practice in the cultivation of coconut<sup>[5]</sup>. Experiments have

shown that fertilizer application markedly increase vegetative growth and nut yield<sup>[1,5]</sup>.

Resulting in the release of various nutrients and organic acids<sup>[6,7]</sup>. Our soils are very low in organic matter<sup>[11]</sup>, thus various organic materials are added to raise its level in the soil. Application of organic material enhances the utilization of fertilizer nutrients by plants and water retention ability of soil<sup>[8]</sup>. However, organic materials have been reported inferior of nutrients compared to mineral sources elsewhere<sup>[9]</sup>. Keeping in view the importance of NPK fertilizers and FYM for coconut production, the present investigation was performed to examine the effect of NPK and FYM on nut production, under Malir conditions.

### MATERIALS AND METHODS

This experiment was conducted at Coastal Agricultural Research Station, Malir during 2001-02 to 2002-03. The experimental soil was sandy loam in texture, with pH 8.5, EC 1.2 dS m<sup>-1</sup>, CaCO<sub>3</sub> 7.2, O.M 0.95%, N 0.048%, available P 9.37 ppm and available K 460 ppm. Eighty four trees of tall variety were selected for this purpose. The experiment was laid out on Randomized Complete Block Design, having seven treatments with three replications and in each replication there were four trees. The experiment comprised the following treatments.

Treatments	Dose (g Palm <sup>-1</sup> )		
	Urea	DAP	MOP
T <sub>1</sub> Control			
T <sub>2</sub> NPK	300	100	500
T <sub>3</sub> "	400	200	750
T <sub>4</sub> "	500	300	1000
T <sub>5</sub> "	600	400	1250
T <sub>6</sub> "	700	270	1600
T <sub>7</sub> FYM @ two wheel barrows Palm <sup>-1</sup>			

The NPK fertilizer doses and FYM were applied as per schedule of treatments. The Nitrogen was applied in the form of Urea, Phosphorus in the form of Di-Ammonium phosphate (DAP) and Potassium as Muriate of potash (MOP). Total number of nuts per tree were counted at the time of final harvesting for yield calculations.

**RESULTS AND DISCUSSION**

**Nut yield data:** The results for the first year are presented in Table 1 and Fig. 1. The data revealed that the highest nut yield of 507 nuts was obtained by the application of 700 g Urea+270 g DAP+1600 g MOP followed by the treatments 600 g Urea+400 g DAP+1250 g MOP and 500 g Urea+300 g DAP+1000 g MOP yielding 438 and 362 nuts, thus giving an increase of 322 and 246 nuts over control (116 nuts), respectively. As far as the application of FYM and its effects on nut yield is concerned, the data obtained revealed that if FYM were applied alone would not have significant effect as compared with chemical fertilizers. In the first year 160 nuts were obtained under FYM treatment. The nut yield data obtained during the second year (Table 1) again showed significant results when analyzed statistically.

The results obtained indicated that the application of 700 g Urea+270 g DAP+1600 g MOP gave highest nut yield of 658 nuts, followed by the application of 600 g Urea+400 g DAP+1250 g MOP yielding 608 nuts, giving an increase of 498 and 448 nuts over control (160 nuts), respectively.

The effect of fertilizer was significant in second year as compared to first year. While, it is fact that in case of first year the soil was not initially well supplied with the nutrient and the nut yield of 116 nuts were obtained even without any addition of fertilizers. The application of 700 g Urea+270 g DAP+1600 g MOP gave better result in this experiment.

A total of 270 nuts were obtained when FYM was applied to coconut palms. The number of nuts increased as compared to first year, revealed that addition of FYM alone had slow effect on the nut yield.

When the average of two years (Table 1) are considered the maximum nut yield of 582.5 nuts was obtained when the maximum dose of the fertilizer (700 g Urea+270 g DAP+1600 g MOP) was applied. The maximum increase of nut yield over control was 444.5 nuts, followed by the treatments 600 g Urea+400 g DAP+1250 g MOP and 500 g Urea+300 g DAP+1000 g MOP, giving an increase of 385 and 324.5 nuts over control, respectively. All the above results showed that by the application of fertilizer the yield increased significantly and the application of 700 g Urea+270 g DAP 1600 g MOP proved better to get economical yields. These results

Table 1: Nut yield of coconut as influenced by fertilizers and FYM application

Treatment	Nitrogen	Phosphorus	Potassium	Nut yield		
				1st year	2nd year	Average
T <sub>1</sub>	0	0	0	116.00	160.00	138.0
T <sub>2</sub>	300	100	500	161.00	302.00	231.5
T <sub>3</sub>	400	200	750	221.00	485.00	353.0
T <sub>4</sub>	500	300	1000	362.00	563.00	462.5
T <sub>5</sub>	600	400	1250	438.00	608.00	523.0
T <sub>6</sub>	700	270	1500	507.00	658.00	582.5
T <sub>7</sub>	FYM @ two wheel barrows Palm <sup>-1</sup>			160.00	270.00	215.0
SE				4.23	2.99	
CV%				7.83	3.58	

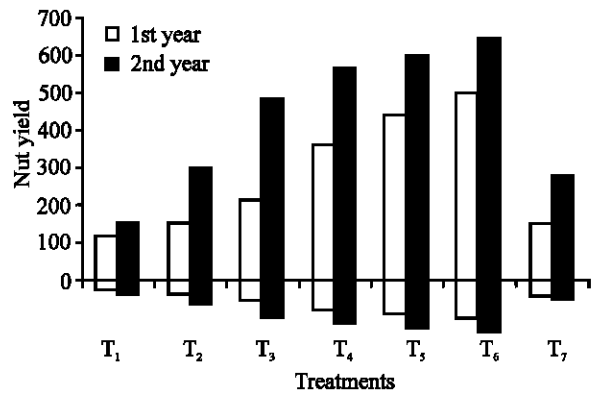


Fig. 1: Nut production of coconut as affected by NPK fertilizers and farmyard manure

are in close conformity of the findings of Longanathan<sup>[5]</sup>, Ananyous<sup>[10]</sup> and Imam<sup>[1]</sup>, who reported good response of coconut to fertilizer.

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