



Research Article

## Productivity and profitability as influenced due to integrated nutrient management in summer groundnut

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**Abstract :** Groundnut (*Arachis hypogaea* L.) is an important oilseed and cash crop of the country. Independent use of neither the chemical fertilizers nor the organic sources can sustain the fertility of soil and productivity of crops. Sustainability of higher yields of groundnut could be achieved through conjunctive use of plant nutrients combining the organic and inorganic fertilizers. Results revealed that application of 75 per cent N through inorganic fertilizer plus 25 per cent N through vermicompost or FYM was found beneficial for achieving higher productivity and profitability of summer groundnut.

**Key Words :** Productivity, Profitability, Integrated nutrient management

**How to cite this Article:** Thorave, D.S. and Dhonde, M.B. (2011). Productivity and profitability as influenced due to integrated nutrient management in summer groundnut, *Internat. J. Forestry & Crop Improv.*, 2 (2) : 141-143.

**Article Chronical :** Received : 18.07.2011; Revised : 04.08.2011; Accepted : 22.10.2011

### INTRODUCTION

In Maharashtra, the groundnut occupies a dominant position as an oilseed crop. The major groundnut growing districts are Dhule, Jalgaon, Akola, Nasik, Kolhapur, Satara, Pune, Ahmednagar and Parbhani. During 2003-04 groundnut occupied an area of 3241 lakh hectares with annual production of 3552 lakh metric tonnes with its productivity of 1096 kg ha<sup>-1</sup> in *Kharif* season (Anonymous, 2005a). During summer season, it occupied an area of 547 lakh hectares with production of 816 lakh metric tonnes and the average productivity of 1492 kg ha<sup>-1</sup> (Anonymous, 2005b). It appears from the above figures that, yields are higher during summer season and this may be due to adequate sunlight, temperature, availability of timely irrigation and fairly disease

and pest free condition. Fertilizers are the 'kingpin' in the present system of agriculture. Scientific uses of fertilizer assume vital importance in sustainable agriculture. Fertilizers pay back to the farmer more profit per unit investment. Integrated nutrient management plays an important role in boosting groundnut production. In other words this concept refers to the maintenance of soil fertility and supply of plant nutrients on desired levels for obtaining optimum or higher groundnut production through all possible sources as organic, inorganic, biotic etc. in an integrated manner. The incorporation of bulky organic manures such as farmyard manure, vermicompost etc. plays an important role in plant nutrition especially for nitrogen. The decomposition of organic matter results into formation of humus which can bring out physical, chemical changes in soil and plays an important role in maintaining soil fertility in both light and heavy textured soils. The processed urban compost is the organic manure which also gives beneficial effect on soil health and production of crop.

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### EXPERIMENTAL METHODS

The field experiment was conducted during summer

season 2005 at Post Graduate Institute Research Farm, Mahatma Phule Krishi Vidyapeeth, Rahuri. The ten treatments consisted of 100 per cent recommended dose of NPK (25:50:00 kg ha<sup>-1</sup> plus 5 t FYM ha<sup>-1</sup>) and nine treatment combinations with 25, 50 and 75 per cent N through inorganic fertilizer plus 75, 50 and 25 per cent N through organic manures namely FYM, processed urban compost and vermicompost were laid out in randomized block design with three replications. The soil of the experimental plot was sandy clay loam in texture with low in available nitrogen (235 kg ha<sup>-1</sup>), moderately high in available phosphorus (32 kg ha<sup>-1</sup>) and very high in potassium (393 kg ha<sup>-1</sup>) with alkaline in reaction (pH 8.1).

## EXPERIMENTAL RESULTS AND ANALYSIS

The results obtained from the present study have been discussed in detail under following heads :

### Dry pod yield:

The application of 100 per cent RDF recorded maximum

dry pod yield (38.45 q ha<sup>-1</sup>) among all of the treatments. However, it was at par with 75 per cent N through inorganic fertilizer plus 25 per cent N through organic vermicompost (Table 1). These findings are in line with those reported by Thakare *et al.* (2003).

### Haulm yield:

The application of 100 per cent RDF recorded the highest haulm yield (52.15 q ha<sup>-1</sup>) among all of the treatments. However, it was at par with 75 per cent N through inorganic fertilizer plus 25 per cent N through vermicompost and 75 per cent N through inorganic fertilizer plus 25 per cent N through FYM (Table 1). Similar results were recorded by Thakare *et al.* (2003).

### Cost of cultivation:

The maximum cost of cultivation (Rs. 25737 ha<sup>-1</sup>) was recorded in treatment of 25 per cent N through inorganic fertilizer plus 75 per cent N through vermicompost over all of the treatments (Table 1). However, it was followed 25 per cent N through inorganic fertilizer plus 75 per cent N through

**Table 1 : Effect of integrated nutrient management on yield, gross monetary returns, cost of cultivation, net monetary returns and benefit cost ratio of summer groundnut**

Sr. No.	Treatments	Dry pod yield (q ha <sup>-1</sup> )	Haulm yield (q ha <sup>-1</sup> )	Gross monetary returns (Rs. ha <sup>-1</sup> )	Cost of cultivation (Rs. ha <sup>-1</sup> )	Net monetary returns (Rs. ha <sup>-1</sup> )	B:C ratio
1.	100 % general recommended dose (GRD)	38.45	52.15	77032	23871	53161	3.23
2.	25 % N through inorganic fertilizer + 75 % N through FYM	28.36	43.12	57516	21640	35876	2.66
3.	50 % N through inorganic fertilizer + 50 % N through FYM	34.26	48.32	68676	20764	47912	3.30
4.	75 % N through inorganic fertilizer + 25 % N through FYM	36.47	50.62	73239	19885	53354	3.68
5.	25 % N through inorganic fertilizer + 75 % N through processed urban compost	26.13	41.12	53202	24188	29014	2.19
6.	50 % N through inorganic fertilizer + 50 % N through processed urban compost	31.42	45.16	63330	22483	40847	2.82
7.	75 % N through inorganic fertilizer + 25 % N through processed urban compost	33.28	46.27	66904	20776	46128	3.22
8.	25 % N through inorganic fertilizer + 75 % N through vermicompost	29.43	43.72	59532	25737	33794	2.31
9.	50 % N through inorganic fertilizer + 50 % N through vermicompost	36.16	50.12	72606	23519	49087	3.09
10.	75 % N through inorganic fertilizer + 25 % N through vermicompost	37.23	51.18	74691	21286	53405	3.50
	S.E. ±	0.58	0.57	1129	-	1129	0.05
	C.D. (P=0.05)	1.74	1.71	3353	-	3353	0.15
	General Mean	33.12	47.17	66673	22415	44258	3.00

Note: GRD: 25:50:00 N, P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O kg ha<sup>-1</sup> + 5 t FYM ha<sup>-1</sup>

processed urban compost (Rs. 24188 ha<sup>-1</sup>).

#### Gross and net monetary returns:

The highest gross monetary returns (Rs. 77032 ha<sup>-1</sup>) were recorded in treatment of 100 per cent RDF. The highest net monetary returns (Rs. 53405 ha<sup>-1</sup>) were recorded in treatment of 75 per cent N through inorganic fertilizer plus 25 per cent N through vermicompost.

#### B : C ratio:

The highest benefit cost ratio (3.68) was recorded in treatment of 75 per cent N through inorganic fertilizer plus 25 per cent N through FYM, which was significantly superior among all of treatments (Table 1). These findings are in confirmily with those reported by Mishra (2000).

#### Conclusion:

It can be concluded that application of 75 per cent N through inorganic fertilizer plus 25 per cent N through vermicompost or FYM found beneficial proposition for

achieving higher productivity and profitability of summer groundnut.

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