

Original Research Article

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Nutrient Management in Prevalent Groundnut based Cropping System (Groundnut-Maize)

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ABSTRACT

Keywords

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The Experiment was conducted during *kharif* season of 2016-17 to evaluate the nutrient management in prevalent groundnut based cropping system (groundnut-maize). Significantly higher mean pod yield of groundnut was recorded with application of 150 % PK compared to control but found on par with 100 % PK and 125 % PK. Seed yield of maize also varied significantly due to fertilizer regimes of maize and fertilizer regimes of proceeded groundnut crop. Highest seed yield of maize (4744 kg/ha) was recorded at 125 % PK for proceeded groundnut and 100 % RDF to maize which was on par with 150 % PK for proceeded groundnut. Highest groundnut pod equivalent yield (4307 kg/ha) of the system was recorded at 150 % PK to groundnut and 75% RDF to maize but found at par with 150% PK to groundnut and 100 % RDF to maize and 125 % PK to groundnut and 100 % RDF to Maize.

Introduction

Groundnut is a good source of oil, protein and food for people and fodder for cattle. Among all oilseeds crops groundnut accounts for more than 40 percent area and 60 percent production in the country. Groundnut followed by maize under irrigated conditions is major cropping system which needs to be optimized with recommendation of fertilizer dose for both the season crops for higher yield as well as maintenance of soil fertility. Fertilizers @ 30-40-50 N, P₂O₅ & K₂ O kg/ha are recommended for irrigated groundnut for sandy loam soils of scarce rainfall zone. While for second season maize crop farmers

are applying fertilizers indiscriminately with which, imbalance in soil nutrients are occurring and nutrient deficiency symptoms are appearing and reducing maize yields. Hence it is necessary to develop fertilizer recommendation for system as whole.

Materials and Methods

The Experiment was conducted at Agricultural Research Station, Kadiri, Andhra Pradesh, India during *kharif* - *rabi* seasons 2016-17. The soils of the experiment field was sandy loam in texture, neutral in P^H (7.4), Low in organic carbon (0.49), available nitrogen (176 kg/ha) and available

phosphorus (28 kg/ha) and medium in available potassium (299 kg/ha). The Experiment was tested in split plot design with three replications. Groundnut was sown @150 kg seed/ha in rows 22.5 cm apart and 10 cm plant to plant spacing. Initially as a source of nitrogen, urea was applied while as a source of phosphorus & Potassium as a SSP, MOP was used during the study. All other treatments were imposed as per the schedule and methodologies given below. These plants were harvested at maturity separately for assessing individual plant yield. The growth parameters and yield parameters were studied.

Results and Discussion

Pod yield of groundnut grown during *kharif* – *rabi* 2016-17 varied significantly due to different fertility levels. Higher mean pod yield of groundnut was recorded with application of 150 % PK compared to control

but found on par with 100 % PK and 125 % PK. Similar results were recorded by Dudhatra *et al.*, (2002) and Jordan *et al.*, (2002). Higher haulms yield, no of pods per plant, no of pegs per plant, 100 pod weight, 100 kernel weight, Shelling % and SMK was recorded with application of 100 % N and 150 % PK. Seed yield of maize also varied significantly due to fertilizer regimes of maize and fertilizer regimes of proceeded groundnut crop. Irrespective of the fertilizer regimes for maize, higher mean maize seed yield was recorded with 150 % PK application for groundnut which was significantly superior over 100 % PK and control. Similarly, Irrespective of the fertilizer regimes for proceeded groundnut crop, higher mean maize seed was recorded with 100 % NPK application for maize which was statistically on par with 75 % NPK application. Interaction effect is also significant.

Table.1 Yield and yield attributes of groundnut (kg/ha) as influenced by nutrient management in the cropping system

Treatments	Pod yield (kg/ha)	Haulm yield (kg/ha)	No. of Pods per Plant	No. of pegs per plant.	100 pod weight (g)	100 Kernel weight (g)	Shelling %	SMK%
Main Plots								
F ₁	1696	1727	11.3	14.7	78.5	34.0	58.9	84.2
F ₂	1894	1976	12.0	15.2	76.7	32.9	56.5	85.0
F ₃	1972	2073	10.4	13.5	81.1	34.6	60.0	86.3
F ₄	2069	2105	13.4	16.6	76.7	34.0	57.1	85.9
CV%								
SEm±	54.9	120.3	22.3	29.3	96.3	48.3	72.3	84.3
CD	193.6	215.1	NS	NS	NS	NS	NS	NS
Sub Plots								
R ₁	1663	1939	11.0	14.3	79.7	33.8	59.1	85.1
R ₂	2008	1969	11.9	15.3	78.0	34.7	59.4	87.2
R ₃	2052	2003	12.4	15.5	77.0	33.2	55.9	83.8
CV%								
SEm±	38.4							
CD	116.1	198.2	NS	NS	NS	NS	NS	NS

Table.2 Pod yield of groundnut (kg/ha) as influenced by nutrient management in the cropping system

Fertility levels for groundnut (<i>kharif</i>)	Fertility levels for maize (<i>rabi</i>)			Mean
	Control (M1)	75 % RDF (M2)	100 % RDF (M3)	
F1: Control (No NPK)	1321	1934	1834	1696
F2: 100 % NPK	1676	1824	2181	1894
F3: 100 % N+125% PK	1897	1959	2058	1972
F4: 100 % N+150% PK	1758	2314	2134	2069
Mean	1663	2008	2052	
	CD	SE(d)	SE(m)	
F	193.6	77.6	54.9	
M	116.1	54.3	38.4	
F×M	248.9	108.6	95.1	
M×F	270.2	117.8	83.3	

Table.3 Seed yield of Maize (kg/ha) as influenced by nutrient management in the cropping system

Fertility levels for groundnut (<i>kharif</i>)	Fertility levels for maize (<i>rabi</i>)			Mean
	Control (M1)	75 % RDF (M2)	100 % RDF (M3)	
F1: Control (No NPK)	3756	3814	4212	3927
F2: 100 % NPK	3584	4351	4115	4017
F3: 100 % N+125% PK	4485	4595	4744	4608
F4: 100 % N+150% PK	4568	4736	4594	4608
Mean	4098	4374	4416	
	CD	SE(d)	SE(m)	
F	127.7	51.2	36.2	
M	89.5	41.8	29.6	
F×M	189.6	83.7	62.7	
M×F	193.5	85.4	60.4	

Table.4 Groundnut pod equivalent yield (kg/ha) as influenced by nutrient management in the cropping system

Fertility levels for groundnut (<i>kharif</i>)	Fertility levels for maize (<i>rabi</i>)			Mean
	Control (M1)	75 % RDF (M2)	100 % RD (M3)	
F1: Control (No NPK)	2570	3202	3235	3002
F2: 100 % NPK	2868	3270	3550	3229
F3: 100 % N+125% PK	3389	3487	3636	3504
F4: 100 % N+150% PK	3277	3889	3662	3609
Mean	3026	3462	3521	
	CD	SE(d)	SE(m)	
F	212.3	85.1	60.2	
M	121.3	56.7	40.1	
F×M	261.1	113.5	86.4	
M×F	289.5	125.8	89.0	

Highest seed yield of maize (4744 kg/ha) was recorded at 125 % PK for proceeded groundnut and 100 % RDF to maize which was on par with 150 % PK for proceeded groundnut all fertilizer levels application to maize. Similar results recorded by Tomar *et al.*, (2007) and Ali *et al.*, (2012). Highest groundnut pod equivalent yield (4307 kg/ha) of the system was recorded at 150 % PK to groundnut and 75% RDF to maize but found statistically at par with 150% PK to groundnut and 100 % RDF to maize and 125 % PK to groundnut and 100 % RDF to Maize.

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