The Andhra Agric. J 57(2):113-115, 2010

Yield and Quality of Rice Fallow Groundnut as Influenced by Sulphur Fertilization to Rice

M Martin Luther, S Narsa Reddy and R Veeraraghavaiah
Department of Agronomy, Agricultural College, Bapatla 522101, Andhra Pradesh

ABSTRACT

A field experiment to study the residual effect of different sources and levels of sulphur on succeeding *rabi* groundnut crop preceding rice was conducted during 1995-1996 and 1996-1997 on sandy loam soil at Agricultural College Farm, Bapatla. The treatments consisted of five sources of sulphur *viz.,* ammonium sulphate, single super phospate, ammonium phospate sulphate, gypsum and elemental sulphur at four levels viz., 0,20,30 and 40 Kg S ha^{-1}, which were applied to preceding *kharif* rice crop. All the five sources of sulphur showed equal effect on groundnut pod yield. Pod number, volume weight, shelling percentage, 100 kernel weight, oil content and finally pod yield were increased with sulphur application from 20 Kg S ha^{-1} level. Application of 40 Kg S ha^{-1} in rice groundnut sequence resulted in maximum oil content and pod yield.

Key words : Groundnut, Rice-fallow, Sulphur

The importance of NPK is well recognized in increasing production. However, sulphur which is essential for the synthesis of proteins, vitamins and sulphur containing amino acids has been ignored. Nutrient management for cropping system differs from that of mono-cropping. The fertiliser need of a crop in a cropping system is greatly influenced by nature of the preceding crop and the amount and form of fertilizers applied to it. Because of long term effect of fertilisers on the crop and soil, fertiliser recommendations should invariably be based on the crop sequence rather than individual crops. Since less than 15 per cent of the fertiliser sulphur is utilised by the crop to which the application was made, its one time treatment is capable of producing residual effect in succeeding crops (Aulakh, *et. al.* 1977; Nad and Goswami; 1984).

MATERIAL AND METHODS

The present investigation was conducted at the Agricultural College Farm, Bapatla during *kharif* and *rabi* seasons of 1995-96 and 1996-97. The soil was sandy loam in texture, slightly alkaline in reaction, low in organic carbon (0.36%) and available nitrogen (220 kg ha^{-1}) medium in available phosphorus (22 kg ha^{-1}) , high in available potassium (285 kg ha^{-1}) and low in available sulphur (9 ppm). The treatments consisted of five sources of sulphur *viz.,* ammonium sulphate, single super phosphate, ammonium phosphate sulphate, gypsum and elemental sulphur and four levels of sulphur *viz.,* 0,20,30 and 40 Kg S ha^{-1}, which were applied to preceding *kharif* rice crop. Each individual rice plot was divided into two to grow groundnut during *rabi* to study the residual effect of the treatments imposed to *kharif* rice. The data were analysed as per the standard analysis of variance procedure for randomized block design with factorial concept.

RESULTS AND DISCUSSION

The yield parameters like pod number, volume weight, shelling percentage, 100 kernel weight, oil content and pod yield of groundnut indicated significant differences due to levels of sulphur only while the sources failed to produce significant differences during both the years of study Table. The residual response of 40 kg S ha^{-1} proved superior to other levels in increasing number of pods $plant^{-1}$ in both the years. The pod number with application of 30 and 20 kg S ha^{-1} in the first year was on a par with each other while this difference was significant in the second year. The interaction between sources and levels indicated that the highest number of pods $plant^{-1}$ was observed with elemental sulphur at 40 kg S ha^{-1} which was significantly superior to all other combinations. Similarly, the higher residual level of 40 kg S ha^{-1} gave higher shelling percentage over 20 kg ha^{-1} in both the years and 30 kg S ha^{-1} in the second year. Volume weight of groundnut pods increased linearly with every increment in level of sulphur in the first year. Sulphur application at 40 kg S ha^{-1} was superior in the first year while it was at par with 30 kg S ha^{-1} in the second year. Kernel weight with the application of sulphur application at 40 kg ha^{-1} was superior in the first year while it was at par with 30 kg S ha^{-1} in the second year. The difference between 30 and 20 kg S ha^{-1} was not significant in

Table. Yield attributes and pod yield of groundnut as influenced by residual sources and levels sulphur in rice fallows.

Treatement	1995-96							1996-97						
	Pods plant^{-1}	Volume wt.(g l^{-1})	Shell-ing (%)	100 kernal wt. (g)	Pod Yield (kg ha^{-1})	Oil content (%)	Oil Yield (kg ha^{-1})	Pods plant^{-1}	Volume wt.(g l^{-1})	Shelling (%)	100 kernel wt. (g)	Pod Yield (kg ha^{-1})	Oil content (%)	Oil Yield (kg ha^{-1})
Sources of sulphur														
Ammonium sulphate	10.0	337.2	65.8	30.3	1973	45.1	601	9.3	323.8	72.2	29.5	1956	48.8	693
Single superphosphate	10.3	338.8	65.6	31.1	2024	45.8	595	9.4	327.7	72.2	28.4	2004	48.9	708
Ammonium phosphate sulphate	9.8	337.2	64.5	30.1	2015	45.9	629	9.1	327.7	71.0	28.4	1977	48.6	688
Gypsum	9.8	341.6	67.5	31.5	2077	47.3	656	9.4	336.1	71.4	30.4	2046	48.7	712
Elemental sulphur	9.5	343.8	64.8	31.7	2051	46.6	610	9.4	333.3	71.4	29.0	2036	48.7	709
SE±	0.7	4.7	2.4	0.9	51	0.8	23	0.2	6.6	1.1	1.3	40	0.4	16
CD (0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Levels of sulphur (kg S ha^{-1})														
0	7.6	320.0	56.5	28.0	1857	42.9	460.2	6.6	306.6	68.6	26.0	1743	46.4	523
20	8.8	330.0	63.8	29.5	1952	45.1	559.3	8.6	322.0	70.5	28.0	1923	48.1	655
30	9.6	341.6	65.3	30.8	2003	45.6	601.6	9.2	330.0	71.3	29.3	2020	48.7	702
40	11.2	347.6	68.0	32.6	2130	47.4	693.5	10.1	337.3	73.1	30.1	2068	49. 5	750
SE±	0.4	2.7	1.4	0.4	37	0.6	17.5	0.1	3.9	0.7	0.8	29	0.3	12
CD (0.05)	0.8	5.5	2.8	0.9	76	1.3	35.7	0.3	7.9	1.3	1.5	60	0.6	25
Interaction (S x L)	NS	NS	NS	NS	NS	NS	NS	Sig	NS	NS	NS	NS	NS	NS

NS = Non-significant

the second year. With increase in the levels of residual sulphur, pod yield increased significantly and the highest level of 40 kg S ha^{-1} produced significantly more pod yield than 20 kg level in both the years while it was superior to 30 kg level in the first year only. A similar residual response on succeeding groundnut was also reported by Biswas and Tewatia (1991). Application of sulphur at 40 kg ha^{-1} to rice was superior in oil content as well as oil yield of groundnut over other levels of sulphur. Similar increase in oil content of groundnut was also reported by Koti *et al*. (1989) and Misra *et al*. (1990).

LITERATURE CITED

Aulakh M S Pasricha N S and Dev G1979. Response of different crops to sulphur fertilization in Punjab. Fertiliser News 22(9): 26-29

Biswas B C and Tewatia R K 1991. Results of FAO –Sulphur trial network in India. Fertiliser News 36(4):11-15

Koti R V Panchal Y C and Manjunath S 1989. Effect of sulphur on pod yield and oil content of groundnut. Journal of Maharastra Agricultural Universities. 14(2): 243-244

Misra U K Sahu S K Das R and Mitra G N 1990. Effect of sulphur and lime on yield and oil content of kharif peanut grown in an Aeric Haplaquept. Journal of Indian Society of Soil Science 37: 441.

Nad B K and Goswami N N 1984. Calcium, magnesium and sulphur requirement of greengram, cowpea and mustard in sequence. Journal of Indian Society of Soil Science 54(7): 569-572.

(Received on 11.04.2008 and revised on 16.02.2010)