

EFFECT OF LIME AND MAGNESIUM ON THE YIELD AND QUALITY OF GROUNDNUT IN THE ACID SOILS OF KERALA*

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The response of groundnut to calcium and magnesium has been reported to be highly significant and more consistent than to any other nutrient. (Jones 1855, Strauss and Grizzard 1946, Ollagnier 1954, Seshadri and Sayeed 1956, Piggot 1960, Kothandaraman 1960, Panicker 1961 and Nagarajan 1969). No information is, however, available on the efficiency of these nutrients in increasing the yield of groundnut in the traditionally acid soils of Kerala where more and more cultivators are taking up the cultivation of groundnut. Hence an experiment was conducted for the purpose at the Agricultural College Farm, Vellayani, the results of which are presented in this paper,

Material and Methods

The experiment was laid out using the randomised block design with 3 replications. Combinations of calcium and magnesium formed the treatments. The treatment consisted of lime at the 3 levels of 0, 750 and 1000 kg per hectare (L_0 , L_1 and L_2 respectively) and magnesium carbonate at the 3 levels supplying 0, 250 and 500 kg per hectare (M_0 , M_1 and M_2 respectively). A uniform dose of 20 kg nitrogen, 30 kg phosphoric acid and 30 kg potash per hectare was applied at the time of sowing. TMV₂ a bunch variety of groundnut with 105 days' duration was the strain of groundnut used.

Results and Discussion

The influence of lime and magnesium on yield and other observed plant characters is represented in Table 1.

It may be observed that application of calcium and magnesium increased the number of root nodules significantly over control, the highest level of 1000 kg of lime and 500 kg of magnesium carbonate recording the maximum number of nodules.

*From the thesis submitted for the M. Sc. (Ag.) degree of the University of Kerala in 1965.

Table I

Effect of different doses of lime and magnesium on LUC yield and other characters of groundnut

Treatments	Number of root nodules per plant	Yield of haulms (kg/ha)	Weight of pods per plant (grams)	Shelling percentage of pods	Yield of pods (kg/ha)	Oil content of kernel %
L ₀	66.00	8190	14.62	73.75	3122	47.35
L ₁	90.30	9845	16.06	81.11	3681	45.34
L ₂	114.30	9252	15.42	85.05	3845	44.88
M ₀	78.30	8608	15.08	74.93	344a	46.87
M ₁	88.90	9087	15.28	82.00	3485	46.22
M ₂	104.00	9596	15.57	82.99	3715	44.48
Rankings	$\overline{L_2} \quad \overline{L_1} \quad L_0$	$\overline{L_1} \quad \overline{L_2} \quad L_0$	$\overline{L_1} \quad \overline{L_2} \quad L_0$	$L_2 \quad \overline{L_1} \quad L_0$	$L_2 \quad L_1 \quad L_0$	$L_0 \quad \overline{L_1} \quad L_2$
	$M_2 \quad M_1 \quad M_0$	$M_2 \quad M_1 \quad M_0$	$M_2 \quad M_1 \quad M_0$	$M_2 \quad \overline{M_1} \quad M_0$	$M_2 \quad \overline{M_1} \quad M_0$	$M_0 \quad M_1 \quad M_2$

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Lime increased the yield of haulms though not significantly. Magnesium application also produced the same effect.

Further, it is seen that application of lime and magnesium increased the weight of pods per plant even though it was not statistically significant. Magnesium increased the weight of pods both individually and in combination with lime.

Application of lime and magnesium is seen to have increased the shelling percentage of pods. Both higher and lower doses of magnesium (500 and 250 kg magnesium carbonate per hectare) increased the shelling percentage of groundnut significantly over control (10.7 and 9.4 percent over control respectively).

Groundnut yield also is seen to have significantly increased by the application of lime. Lime at 1000 kg per hectare gave the maximum yield which was 23 percent over the yield of control and lime at 750 kg per hectare gave 18 percent increase in yield over control.

The results also showed that magnesium at 500 kg per hectare alone significantly increased the yield over control and over the lower dose of 250 kg per hectare. Hence the influence of magnesium was only secondary when compared to that of lime in increasing the yield.

The percentage of oil content was decreased by the application of higher doses of lime and magnesium.

Summary

An experiment was conducted to study the effect of graded doses of lime and magnesium over a basal dose of 20 kg nitrogen, 30 kg phosphoric acid and 30 kg potash on the yield and quality of groundnut when grown in the acid soils of Kerala.

The yield of pods increased by 18 and 23 percent with lime applied at 750 kg and 1000 kg per hectare respectively and by 7.7 and 1.1 percent with magnesium applied at 500 and 250 kg per hectare respectively.

Lime at 1000 kg together with 250 kg magnesium per hectare increased the percentage of fully matured pods per plant significantly.

Shelling percentage of the pods increased with the application of lime with magnesium the maximum shelling percentage being obtained at the combined dose of 1000 kg lime and 500 kg magnesium carbonate per hectare.

Combination of lime and magnesium was superior to the application of either lime or magnesium individually in the production of root nodules.

Both calcium and magnesium were found to have a depressing effect on the oil contents of the nuts.

Maximum yield of pods (4112 kg per ha) was recorded by the application of 1000 kg of lime and 500 kg of magnesium carbonate per hectare when applied in combination.

Acknowledgements

The guidance offered by Mr. K. Madhavan Nair, Professor of Agronomy (Retired) and the valuable helps rendered by Mr. C.M. George, Professor of Agronomy and Dr. C. K. N. Nair, Principal, Agricultural College, Vellayani, are gratefully acknowledged.

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(Accepted : 24-4-1971)