

EFFECT OF PLANT DENSITY, LEVELS OF NITROGEN AND GYPSUM ON
GROWTH AND YIELD OF GROUNDNUT (ARACHIS HYPOGAEA L.) IN
REGOSOLS IN BATTICALOA DISTRICT

By

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ABSTRACT

Two experiments, one to study the effect of optimum spacing (plant density) and the other to study the effect of plant density, levels of nitrogen and gypsum on growth and yield of groundnut (*Arachis hypogaea* L.) were conducted in Batticaloa in the Eastern region of Sri Lanka, during the period June to October 1991 and January to May 1992 respectively, with the variety of groundnut MI-1.

The first experiment, undertaken to identify the optimum spacing for groundnut, tested a range of nine inter-row spacings viz. 33, 36, 39, 42, 45, 48, 51, 54 and 57 cm and seven intra-row spacings viz. 10.5, 12.0, 13.5, 15.0, 16.5, 18.0 and 19.5 cm using a systematic design. The results, at harvest, indicated that Leaf Area Index, dry weight of leaves, stems, roots, nodules, pods and total dry matter and number of pods per unit area were highest at the inter-row spacing of 33 cm and at an intra-row spacing of 10.5 cm (288,600 plants/ha). Regression of plant density on yield of pods indicated that highest yield was at the highest plant density (288,600 plants/ha) tested.

In the second experiment, the effect of selected densities viz. 396,826 (24 x 10.5 cm); 352,733 (27 x 10.5 cm); 288,600 (33 x 10.5 cm) and 148,148 (45 x 15 cm) plants/ha, at two levels of nitrogen (15 and 30 kg/ha)

and in combination with three levels of gypsum (0, 250 and 500 kg/ha) on growth and yield was tested. The results showed that pod yield was higher (by 74%) at a plant density of 352,733 plants/ha compared with that at 148,148 plants/ha. A further increase in plant density had no effect on pod yield. Similar results were obtained with dry weight of stems, roots, nodules and whole plant, number of pods per unit area, shelling percentage and 100-kernel weight. On per plant basis, however, the above growth indices were highest at the lowest density (148,148 plants/ha) tested.

Nitrogen levels tested did not have any effect on growth indices. Application of gypsum at the rate of 500 kg/ha at 6 weeks after planting increased LAI, number of primary branches, dry weight of leaves, stems, roots, pods and whole plant, number of pods per unit area, shelling percentage and 100-kernel weight.

The results suggest that under the conditions in the experiments yield could be increased by 74% by increasing plant density from the presently recommended density of 148,148 plants/ha to 352,733 plants/ha and by 34% by the application of gypsum at 500 kg/ha at flower initiation time.