

B-07: Effect of C:N ratio on nodulation and yield of groundnut cultivar on sandy regosol

P Mahendran, K Thedchanamoorthy

(Dept of Agronomy, Eastern Univ, Chenkalady)

Nitrogen fertilization adversely affects the nodulation of many legumes. Groundnut cultivars may vary in their response to nitrogen fertilizer. In general, with an increase in the rate of nitrogenous fertilizer utilization, the rate of nitrogen fixation decreases. This experiment was designed to evaluate

the effect of different C:N ratio on biological nitrogen fixation of groundnut (*Arachis hypogea*) cultivars.

A pot experiment was carried out at the Eastern University, Chenkalady, to evaluate the effect of some carbonaceous materials such as coir dust, straw and farmyard manure (nitrogenous material) on the biological nitrogen fixation of a groundnut cultivar grown on sandy regosol. Variety used in this study was ICG 2729. The experiment was designed as a complete randomized block with 4 replicates. The treatments are given below.

T₀ - Control;

T₁ - Inoculation with nitrogenous fertilizer

T₂ - Inoculation with coir dust 10 tons/ha

T₃ - Inoculation with coir dust 20 tons/ha

T₄ - Inoculation with straw 10 tons/ha

T₅ - Inoculation with straw 20 tons/ha

T₆ - Inoculation with farmyard manure 10 tons/ha

T₇ - Inoculation with farmyard manure 20 tons/ha

No fertilizer application was done. To each pots was added 500 ml nutrient solution containing KH₂PO₄, KCl, MgSO₄, CaCl₂, MnSO₄, ZnSO₄, CuSO₄, H₃BO₃, Na₂MO₄ and Ferric citrate. Sampling was performed 3.5 months after planting to assess nodulation. Dry weight of pods, nodules and plants, leaf area index were also determined.

An increase in the dry weight of effective nodules was observed to be 650 and 433.3% of increase in the groundnut plants which were inoculated and treated with straw and coir dust resp. at 20 tons/ha level compared to control. An increase of dry weight of pods was observed in the above plants. But a remarkable increase in the pod weight was observed to be 211.54% of increase over control in the straw treated plants at 20 tons/ha level. It is interesting to note that plants treated with farmyard manure showed 111.54% of increase over control but the nodule weight was observed to be 33.3% over control.

It confirms that adding carbonaceous material (high carbon : nitrogen) to soil causes a nitrogen starvation for micro organisms in soil. Therefore, micro organisms will start to utilize the inorganic nitrogen from the soil. Finally the nitrogen content of soil will go down and induces nitrogen fixation.