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Effect of integrated use of fertilizer P, pressmud and PSM on N, P, K and S content and uptake by summer groundnut under Gujarat condition

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ABSTRACT

In order to confirm the efficiency of intigration of inorganic fertilizer with pressmud and psm for yield, nutrient content and uptake of groundnut, the field experiments were conducted for two years on college research farm at, Navsari. The results indicated clearly that pod, haulm, karnal and shell yields of groundnut were significantly higher under optimum dose of 15 kg P from SSP (inorganic) + 5 t pressmud (organic) + 2.5 kg PSM (biofertilizer) ha^{-1}. In gernal, the higher N, P and S content in Kernal was found as compared to haulm and shell. The higher N and K content in haulm were found as compaired to shell, where as P and S content in shell were higher than haulm during both the years. The higher N, P, K and S content and uptake were recorded by optimum dose of 15 kg P from SSP + 5 t pressmud + 2.5 kg PSM ha dynamics of manganese fractions in the LTFE's soils.

Key words : N, P, K, S, Pressmud, PSM, Groundnut

Groundnut is an important oilseed and cash crop of the country and is widely grown in between 40^0N and 40' S latitudes. Among the agronomic practices, fertilization plays significant role in enhancing the pod yield. Balanced nutrient application is must for obtaining optimum yield. Integrated nutrient management seems to improve soil fertility for sustaining the desired level of crop production and productivity through optimization of the benefit from all possible sources of plant nutrient in an integrated manner.

MATERIALS AND METHODS

The present investigation was conducted at Research Farm of Agricultural College, Navsari during summer seasons of 2002 and 2003. Groundnut variety GG-2 was taken for experiment. The treatments comprised the combinations of two levels of phosphorus (15, 30 kg P ha^{-1}) and its two sources (SSP and DAP) with and without pressmud (5 and 10t ha^{-1}) and phosphours solublizing microorganisems (PSM) (2.5 kg ha^{-1} soil application). Thus, fifteen phosphorus management treatment combinations me as follows: T_1-2.5 kg PSM ha^{-1} only, T_2 -5 t pressmud ha^{-1} + 2.5 kg PSM ha^{-1}, T_3-10 t pressmud ha^{-1} + 2.5 kg PSM ha^{-1}, T_4-15 kg P ha^{-1} from DAP + T_1, T_5-15 kg P ha^{-1} from SSP + T_1, T_6-30 kg P ha^{-1} from DAP + T_1, T_7-30 kg P ha^{-1} from SSP + T_1, T_5-15 kg P ha^{-1} from DAP+ T_2, T_8-15 kg P ha^{-1} from SSP + T_2, T_{10}-15 kg P ha^{-1} from DAP + T_3, T_{14}-15 kg P ha^{-1} from SSP + T_3, T_{12}-30 kg P ha^{-1} from DAP + T_2, T_{13}-30 kg P ha^{-1} from SSP + T_2, T_{14}-30 kg P ha^{-1} from DAP + T_3, T_{15}-30 kg P ha^{-1} from SSP + T_3. The experiment was laid out in randomized block design with three replications. The pH of the soil taken before the start of experiment was 8.0, organic carbon 3.9 g kg^{-1}, low in available nitrogen 237 kg ha^{-1}, low in available P (8.44 kg ha^{-1}), high in available K (287.18 kg ha^{-1}) and available sulphure 14 ppm. Ten irrigations were given during both the years. A recommended package of practices were followed. During the second year experiment was conducted on same site. Nitrogen @ 25 kg ha^{-1} was applied through urea in all treatments and this dose was adjusted in DAP treatment. No application of K fertilizer through chemical fertilizer to groundnut crop was done but it was taken by groundnut crop through pressmud applied treatments. Nutrient composition of pressmud used in the study is given below:

	Pressmud composition (%)				
	N	P	K	S	Oven dry weight (%)
2002	1.28	1.85	1.08	0.27	65
2003	1.33	2.10	1.36	0.36	50

RESULTS AND DISCUSSION

Pod, haulm, kernel and shell yield:

Pod, hauhn, kernel and shell yields of groundnut (Table 1) increased significantly due to appllcation of 30 kg P ha^{-1} from SSP + 5 t pressmud ha^{-1} + 2.5 kg PSM ha^{-1} (T_{13}) and statistically at par with treatments 15 kg P ha^{-1} from SSP + 10 t pressmud ha^{-1} +2.5 kg PSM ha^{-1} (T_{11}), 30 kg P ha^{-1} from SSP/DAP + 10 t pressmud ha^{-1} + 2.5 kg PSM ha^{-1} (T_{15} / T_{14}), 15 kg P ha^{-1} from DAP + 10 t pressmud ha^{-1} + 2.5 kg PSM ha^{-1} (T_{10}) and 15 kg P ha^{-1} from SSP + 5 t pressmud ha^{-1} + 2.5 kg PSM ha^{-1} (T_9) in respect of