CHAPTER VI

SUMMARY & CONCLUSIONS
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An investigation was carried out to study the effect of phosphorus, molybdenum and vermicompost on growth and yield of groundnut (Arachis hypogaea L.) at Krishi Vigyan Kendra, Gaddipalli, Nalgonda district in two different consecutive seasons during kharif 2008 and rabi 2009 on sandy loam soils with moderate clay content.

The mechanical analysis of the soil consisted of sandy loam (76.34% sand), silt (13.52%) and clay (10.14%). The chemical analysis indicated that the soil was slightly alkaline (pH 7.0), non-saline (EC 0.14 dSm⁻²), medium in available nitrogen (235 kg ha⁻¹), low in available phosphorus (18.0 kg ha⁻¹), high in available potassium (310 kg ha⁻¹) and low in available molybdenum (0.08 ppm). The trial was laid out with three levels of phosphorus (0, 40 and 80 kg P₂O₅ ha⁻¹), three levels of molybdenum (0, 1.5 and 3.0 g kg⁻¹ seed) and two levels of vermicompost (0 and 100 kg ha⁻¹) in a randomized block design and replicated thrice.

The salient features of the trial are summarized as detailed below:

An increase in plant height and drymatter was recorded when phosphorus was applied up to 40 kg P₂O₅ ha⁻¹. There was no response to main root length. The lateral root length and dry root weight increased with 80 kg P₂O₅ ha⁻¹ over zero application of phosphorus. Similarly, there was an increase in the number of total nodules and effective nodules with 80 kg
P$_2$O$_5$ ha$^{-1}$ over zero kg phosphorus. Volume weight of pods and 100-kernel weight increased with increased level of phosphorus over zero level of phosphorus. There was significant effect of phosphorus on pod and haulm yield in kharif 2008; whereas significant influence was not noticed in rabi 2009 season.

Phosphorus application 40 kg P$_2$O$_5$ ha$^{-1}$ significantly increased the total uptake of phosphorus and molybdenum including haulm over zero application of phosphorus.

Molybdenum did not show any effect on plant height, LAI and main root length. Molybdenum @ 3.0 g kg$^{-1}$ seed treatment had increased the lateral root length, root dry weight and drymatter accumulation over 1.5 g and zero molybdenum application. There was an increase in total nodules and effective nodules with 3.0 g kg$^{-1}$ seed molybdenum treatment upto 60 days. Afterwards there was a decline in nodulation. Highest number of total pods and number of filled pods were obtained with 3.0 g kg$^{-1}$ molybdenum seed treatment. Volume weight of pods increased significantly with 3.0 g kg$^{-1}$ seed molybdenum in comparison to zero molybdenum.

Shelling %, 100-kernel weight and harvest index were not influenced by molybdenum application.

Significant increase in pod yield was observed with 1.5 g kg$^{-1}$ molybdenum seed treatment. Further increase from 1.5 g to 3.0 g molybdenum was marginal in rabi 2009.
There was an increase of 15 and 24 per cent in haulm yield with 3.0 g molybdenum over 1.5 g and zero molybdenum, respectively.

Molybdenum seed treatment with 3.0 g kg$^{-1}$ increased the uptake in seed over zero application of molybdenum. Seed treatment with molybdenum @ 3.0 g kg$^{-1}$ increased the total uptake of P, Mo and haulm over zero molybdenum.

Application of vermicompost had not influenced plant height, main root length or dry root weight.

Vermicompost @ 100 kg ha$^{-1}$ significantly increased the lateral root length, drymatter accumulation and leaf area index.

Total number of nodules and effective nodules plant$^{-1}$ are increased by 19 and 75 %, respectively with 100 kg ha$^{-1}$ vermicompost application over zero vermicompost application.

There was no significant effect on total number of pods plant$^{-1}$, number of filled pods plant$^{-1}$, volume weight and shelling percentage with the application of vermicompost.

There was an increase in the 100-kernel weight with 100 kg ha$^{-1}$ application of vermicompost.

Total uptake of phosphorus and molybdenum in haulm increased with increase in vermicompost application (100 kg ha$^{-1}$).

The interaction between phosphorus and vermicompost influenced the effective nodule number, volume weight and total uptake of P.
Molybdenum x vermicompost interaction influenced drymatter accumulation, number of total pods, number of filled pods and total uptake of P and Mo.

The three factor interaction between P X Mo X Vc influenced shelling percentage, volume weight, pod yield and total uptake of P and Mo in seed.

Under proximate analysis, protein levels of 28.5 g. 100'1 g were recorded as the highest among all the treatments where the crop was fertilized with all the three nutrients in highest measure (80 kg P₂O₅, 3.0g molybdenum and lq. of vermicompost).

Accumulation of carbohydrates continue to increase with the increase in the levels of phosphorus and molybdenum application

Nutrients applied had influenced the increase in oil and protein content of groundnut kernels.

There was an increase in the amino acid composition ranging in different acids and the increase was gradual.

The gas chromatographic data on percentage composition of different types of fatty acids showed that Octodecanoic acids were the highest among all the eight compounds obtained.

Phosphorus application significantly increased the oil content groundnut kernels.

There was no dramatic response in the increase of the oil content where different doses of phosphorus, molybdenum and vermicompost were applied to the crop.