

RESEARCH PAPER:

Formulation of a liquid fertilizer and a comparative study on its effect on growth and yield of *Arachis hypogaea* L.

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Asian Journal of Environmental Science | December, 2011 | Vol. 6 Issue 2 : 191 -195

Received:

September, 2011

Revised :

October, 2011

Accepted :

November, 2011

SUMMARY

Groundnut (*Arachis hypogaea* L.) is one of the world's most important oil seed crop. Experiments were designed to evaluate the effect of humic acid extracted from vermicompost and compared with other fertilizers. For the study, four different treatments were given (a) LF-1(Liquid fertilizer formulated in our lab - 2 per cent Humic acid extracted from vermicompost + 1 per cent (Anolyte water), (b) LF-2 (Liquid fertilizer commercially purchased), (c) 1 per cent (Anolyte water and (d) Vermicompost, to determine the effect of different fertilizers on physico-chemical parameters of the soil, germination rate, shoot length, root length, yield, weight of 100 seeds and the biochemical contents. The application of 2 per cent humic acid in anolyte water increased the macronutrient (N, P and K) and micronutrient (Cu, Fe and Zn) content of the soil, enzyme activity (urease, phosphatase and dehydrogenase) of the soil, germination rate, shoot length, yield, weight of 100 seeds and the biochemical contents of the groundnut crop. The micronutrient content (copper) and root length was maximum in the plants subjected to treatment T₅ (vermicompost). The micronutrient content (manganese) of the soil was maximum in the plants treated with LF-2.

How to cite this paper: Sabeetha, P., Padma Devi, S.N. and Vasandha, S. (2011). Formulation of a liquid fertilizer and a comparative study on its effect on the growth and yield of *Arachis hypogaea* L. *Asian J. Environ. Sci.*, 6(2): 191-195.

Key Words :

Humic acid,
Vermicompost,
Groundnut, Anolyte
water liquid
fertilization

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Groundnut (*Arachis hypogaea* L.) plays an important role and has much importance in the national economy among the oilseed crops. Groundnut is not only used as the source of edible oil but also used in manufacture of soap and hydrogenated vegetable oil. The entire plant has an economical value like the kernels that are rich in vitamins, oil and protein content that is used as food, dry plant stalk used as fodder for animals, and the groundnut cake is the best source in organic fertilizer. Due to increase in population, the demand for vegetable oil in India has been steadily increasing more than 2 per cent per annum. All these factors make a demand for improving the yield of groundnut.

It is believed that dark coloured soils with high humus are more fertile than the light-coloured soils. Anywhere on the globe where there is soil or water associated with organic matter, humic substances are present. They cause the brownish tint often seen in natural streams, the darkness of dark soils and the dark

brown colour of lignite coal and vermicompost is due to humus content (Mayhew, 2004). Humic substances are very effective on plant growth. Humic acid that was extracted from vermicompost increases the growth of crops grown when amended with planting media (Arancon *et al.*, 2003; Atiyeh *et al.*, 2002).

Humic substances play a multiple role to enrich the soil. The indirect effects are the adsorption of water, the amelioration of soil by drainage and aeration. The absorption of plant nutrient by plant roots influences direct effect on the physiological process of plant (Ohta *et al.*, 2004; Chen *et al.*, 2004).

Anolyte technology is a Russian patented technology that was initially spun off for the astronauts in space. This technology employs electro-activation of water along with natural salts like NaCl. As a result, reactive ions and free radicals are formed in the anolyte chambers of the enviolyte reactor. This electroactivated water collected from the anolyte chamber is called the anolyte water.