RESEARCH PAPER

Asian Journal of Bio Science Vol. 6 Issue 2 (Oct., 2011) : 227-231

Formulation of a liquid fertilizer and a comparative study on its effect on the growth and yield of *Vigna radiata* (L.) Wilczek

P. SABEETHA, S.N.PADMA DEVI AND S.VASANDHA
Department of Botany, P.S.G.R.Krishnammal College for Women, COIMBATORE (T.N.) INDIA

(**Received:** Jul., 2011; **Revised:** Aug., 2011; **Accepted :** Sep., 2011)

Green gram [*Vigna radiata,* (L.) Wilczek] is the third most important pulse in India. It is the protein rich staple food and it supplies the protein requirement of vegetarians of our country. To improve the productivity and yield of green gram crop a study was made to assess the different treatments on its growth and yield. Four different treatments were given namely 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. Effect of the different treatments on physico-chemical parameters of the soil, germination rate, shoot length, root length, yield ratio, weight of 100 seeds and the biochemical contents of green gram crop were studied. The application of LF-1 (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, growth, yield, 100 seeds weight, protein and vitamin C content of green gram crop. The micronutrient content (manganese) was maximum in the plants subjected to vermicompost and carbohydrate content was maximum in the plants treated with LF-2 (Liquid fertilizer commercially purchased).

Key words : Humic acid, Vermicompost, Green gram, Anolyte water

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 *Vigna radiata* (L.) Wilczek. *Asian J. Bio. Sci.*, **6** (2) : 227-231.

INTRODUCTION

Green gram is one of the important pulse crops. It has been reported that green gram has been cultivated in India since ancient times. It contains 25 per cent of protein, which is almost three times that of cereals.

Vermicomposts originated from animal manures, food and paper mill sludge had been shown to contain large amount of humic substances (Arancon *et al*., 2006). Treating *A.rosea* with humic substances obtained from vermicompost increased the growth and induced the morphological changes similar to that of auxins (Muscolo *et al*., 1999).

Humic materials are very large and complex molecules extracted from organic matters such as composts and lignite coals (Mayhew, 2004). Humic materials have an abundance of carboxyl groups and weakly acidic phenolic groups, which contribute to their complications and ion-exchange properties. They exhibit both hydrophobic and hydrophilic characteristics and can bind to soil mineral surfaces. The humic substances in the soil have multiple effects. It plays dual role as direct and indirect effects to improve both soil and plant growth (Sangeetha *et al*., 2006). Soil aggregation, aeration, permeability, water holding capacity, micronutrient transport and availability were improved indirectly (Tan, 2003). Direct effects are those, which require uptake of humic substances into the plant tissue resulting in various biochemical effects (Chen *et al*., 2004).

The electro chemically activation (ECA) of solutions is a recently developed technology that is very suitable for water treatment. ECA is a relatively simple and completely eco-friendly method of producing a very potent mix of disinfecting and oxidizing molecules, ions and radicals from normal tap water and salt. ECA technology provides with the possibility of onsite production, can be very easily fitted into existing systems and the operation is completely safe. Two different activated solution of catholyte and anolyte water are produced in Envirolyte Reactor. http://www.envirolyte.com/oilandgas.shtml.

Anolyte water has the following uses such as prevention of soil born bacteria, fungi and viruses, controls root and fungal diseases, used in post harvest treatment for cut flowers, biological crop protecting agent