

Effect of sewage sludge application on the growth and seed germination of wheat crop (*Triticum aestivum* L.)

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■ **ABSTRACT** : Now a day's treatment and disposal of sewage sludge has become a serious problem in the developing country like India. Sewage sludge can be used as growth enhancer for agricultural field at proper concentration for particular crop. This paper examines the effect of sewage sludge application as nutrient source for wheat crop at 5, 10, 15, 20, 25 and 30 per cent concentration with soil matrix. Six pots were prepared of above concentration of sewage sludge and one control. Study of seed germination was done in order to know the germination rate of seeds at various concentration of sewage sludge. Monitoring of wheat growth was done with respect to the plant height, leaf width, number of spikelets, for an interval of 10, 15, 20, 25 and 30 days. At 20 per cent pot concentration height of plant, width size, and no. of spikelet, roots no. and shoot of plant show maximum results whereas at 25 per cent concentration chlorophyll content in plant leaf was higher compared to other pots. Thus beneficial effect of sewage sludge was observed in wheat crop as compared to control sample due to required essential nutrients as well as trace metals in the sludge acts as growth enhancer in some crops like wheat. These imply that the use of sewage sludge at proper concentration as a manure could be more effective and economical to increase the yield of crops on sustainable basis.

■ **KEY WORDS** : Sewage sludge, Toxicity, Wheat crop, Germination

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Uncontrolled and inadequate disposal of sewage sludge has resulted in a serious threat to living habitat as well as an environment. Sewage sludge application to agricultural fields is now very common exercise which is effective long-lasting amendment in the country. As sludge contain high amount of organic carbon and vital plant nutrients it may affix or replace the use of chemical fertilizers for crop production. Sewage sludge disposal in a manner which is not harmful to the environment, minimizes health risks and also is economically feasible has become a concern in many parts of world. Use of sludge as a soil conditioner or fertiliser application is widely recommended as it contains a higher proportion of nutrients as well as organic matter (Bettiol, 2004). Application of sewage sludge improves the physical, chemical and biological properties of soils (Aggelides and Londra, 2000, Benitez *et al.*, 2001, Parkpian *et al.*, 2003). It improves water retention in sandy soils and promotes soil structure in clayey soils by increasing the stability of soil aggregates. Use of sludge as manure is a cost effective task for farmers. Also, the disposal problem of sludge will be reduced. Recognizing

chemical composition of sewage sludge is most useful requirement when developing recommendations for the rates of sludge applications on agricultural land (Beltran *et al.*, 1999). Availability of nitrogen depends on treatment of sludge. Dewatered untreated sludge releases nitrogen slowly which supports growth of crops over a long time. Concentrations of metal in the soil after sludge applications produce significant increase in trace metals concentrations in the eatable crops grown. Concern must be taken while applying sewage sludge to land to preclude any adverse environmental impact. Trace metals such as copper, nickel, manganese, zinc and magnesium present in sewage sludge show their beneficial effects only when they are in appropriate levels as higher concentrations may cause phytotoxicity in plants as well damaging soil quality this will ultimately leads to make an environmental impairment. Due to excessive application of sewage sludge in the fields, factors such as plant toxicity and accumulation of heavy metals affects the soils (McGrath *et al.*, 2000).

The main objective of the study was to assess the desirability of sewage sludge to supply the required plant