

RESEARCH ARTICLE

Study of physical parameters and productivity of wheat irrigated with sewage water under IAA application

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ABSTRACT

A field experiment was conducted to use the two concentrations of sewage water (50% and 100 %) treated with 10 ppm and 20 ppm Indole Acetic Acid (IAA) (Auxin) concentrations for irrigating wheat (*Triticum aestivum* L.) variety PBW-343. Results showed that the application of 10ppm and 20 ppm IAA with both the sewage water (SW) concentrations stimulated the physical parameters such as plant height, number of tillers and leaf area as compared to sewage water alone and control (tap water). Parameters of productivity/yield such as number of ear/plant, grain yield, straw yield, grains/head, 1000 grain weight and harvest index induced in sewage water with IAA compared to sewage water alone (50 and 100%) and control. 20 ppm concentration of IAA resulted an increment in all these parameters compared to 10 ppm IAA. The high nutrients and organic matter contents of sewage water make it an excellent fertilizer which enhanced the crop productivity.

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INTRODUCTION

Rapid growth of urban population results in generation of huge quantities of sewage water perennially. In India only 30 per cent of the sewage water (SW) is treated before it's discharged. Thus, untreated sewage water finds its way into water system such as rivers, lakes, ground water and coastal waters, causing serious water pollution (GOI, 2002). Sewage and industrial waste water is commonly used for irrigating agricultural fields in developing countries including India (Pandey *et al.*, 2008; Nath *et al.*, 2009).

Application of sewage water to cropland and forested lands is an attractive option for disposal because it can improve physical properties and nutrient contents of soils (Kiziloglu *et al.*, 2007). Sewage water irrigation not only provides water, N and P but also organic matter to the soils (Siebe, 1998).

Thus, its use would help in water conservation, recycling nutrients (N., P and K.) in sewage water, reducing direct fertilizer inputs and minimising pollution leads to receiving water bodies (Vasudevan *et al.*, 2010; Thapliyal *et al.*, 2009). Continuous use of sewage water leads to the enrichment of soil with essential macro and micro-nutrients (Kanan *et al.*, 2005).

Auxin *i.e.* Indole Acetic Acid (IAA) can manipulate a variety of growth and development phenomena in various crops. IAA has been found to increase the plant height, number of tillers, number of leaves per plant, fruit size with consequent enhancement in seed yield in groundnut (Lee, 1990), cotton (Kapgate *et al.*, 1989), cowpea (Khalil and Mandurah, 1989) and rice (Kaur and Singh, 1987). It also increases the flowering, fruit set, and the total dry matter of crops (Gurdev and Saxena, 1991). The study also quantified the impact of sewage water irrigation with IAA in wheat crop.