RESEARCH PAPER:

Effect of distillary spent wash on germination rate of wheat, chickpea and Fenugreek

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SUMMARY

Distillery spent wash is an effective organic liquid manure derived from distillery industries. A laboratory work was undertaken to assess the waste water quality parameters of treated distillery effluent and the effect of various concentrations *viz.*, 0, 25, 50, 75 and 100% on seed germination and germination value of three selected seeds *i.e.* wheat (*Triticum aestivum*), chickpea (*Cicer arietinum*), and fenugreek (*Trigonella foenum-graceum*). The high value of TS (4605 mg/l), BOD (587.4 mg/l) and COD (2611.20 mg/l) indicated the high inorganic and organic load. Germination percentage decreased with increasing concentration of effluent in all the tested seeds, whereas the germination speed, germination value increased from control to 25% and 50% concentration and decreased from 50% to 75% and 100% effluent. To estimate the probable liquid fertilizer benefit, studies on subsequent dilutions is needed to corroborate the present study.

Key words : Distillery effluent, Physico-chemical analysis, Seed germination, wheat, Chickpea, Fenugreek

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Diverse nature of agro-based industrial effluents from various industries are disposed off in to soil and water bodies, which have been causing major pollution problem. To economize the irrigation water, industrial effluents are now days commonly used for irrigation purpose. So, it is relevant to understand the response of crops to industrial effluents dependent on it. Distillery effluent contains appreciable amounts of macro and micronutrients such as K, N, Fe, Cu, Zn and B which are essential for plant growth. Several researchers have shown that the use of distillery effluent in agriculture for soil amendment or as a supplement to irrigation water in a judicious way improved crop growth, and physical, chemical and biological properties of soil. Pathak *et al.* (1999), suggested dilution of distillery effluent so as to bring down its BOD to 1000 mg L^{-1} before application in standing crop of rice and wheat for higher yield and improved soil properties. Deverajan *et al.* (1994), showed that distillery effluent could be safely used as liquid manure if applied at a rate of 125–250 cubic m ha^{-1}. The distillery effluent is mixture of organic and inorganic nutrients and has been reported to have a beneficial effect on seed germination (Subramani *et al.*, 1999). According to Ramana *et al.* (2002) the sensitivity of the plants varies from species to species to the effluent salinity. A laboratory experiment was designed to know the effect of different concentrations (0-100%) of distillery effluent on seed germination in some vegetation species like wheat (*Triticum aestivum*), chickpea (*Cicer arietinum*) and fenugreek (*Trigonella foenum-graceum*).

MATERIALS AND METHODS

The effluent was collected from the Madhukar Co-operative Distillery, Faizpur (M.S.), India where over diluted effluent has been released by the factory. The physico-chemical properties of the effluent were analyzed following the procedure of APHA (1995). To bio-assay the concentration of the effluent, control (tap water), 25%, 50%, 75% and 100% concentrations were made by diluting the effluent with distilled water in the ratio of 0:1, 1:3, 1:1, 3:1 and 1:0, respectively. Forty seeds each of wheat (*Triticum aestivum*), chickpea (*Cicer arietinum*) and fenugreek (*Trigonella foenum-graceum*) were sterilized by 0.1% of mercuric chloride solution to remove the microbes after thorough wash with water. Seeds were then spread on the sterilized Petri dishes lined with filter paper. The seeds were irrigated with equal volumes (15 ml) of different concentrations of distillery effluent at an interval of 24 hours. For each treatment, three replicates and in each replicate 40 seeds were taken for the germination experiment.