

عنوان مقاله:

Pearl millet (*Pennisetum Glaucum* L.) response after ferti-irrigation with sugar mill effluent in two seasons

محل انتشار:

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خلاصه مقاله:

Background The disposal of sugar mill effluent has become a major problem in India due to generation of huge volume of effluent. The value of wastewater for crop production has been recognized in many countries, including India. The effluents not only contain nutrients that stimulate growth of many crops, but also may have various toxic chemicals, metals, metallic oxides along with nitrogenous and phosphate compounds, which may affect various agronomical characteristics of crop plants. The present investigation was conducted to assess the agro-potentiality of agro-based sugar mill effluent as ferti-irrigant, and an alternative of irrigation water. Six plots were selected for six treatments of sugar mill effluent viz. 0 % (control), 20, 40, 60, 80, and 100 % for the fertigation of *Pennisetum glaucum* L., cv. Nandi 35. *P. glaucum* was grown, fertigated with effluent till harvest and effect of effluent fertigation on the soil and agronomical characteristics of *P. glaucum* were analyzed. **Results** The fertigant concentration produced changes in electrical conductivity (EC), pH, organic carbon (OC), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), total Kjeldahl nitrogen (TKN), phosphate (PO_4^{3-}), sulfate (SO_4^{2-}), iron (Fe), cadmium (Cd), chromium (Cr), copper (Cu), manganese (Mn), and zinc (Zn) of the soil in both seasons. The agronomic performance of *P. glaucum* increased from 20 to 40 % in both seasons compared to controls. The accumulation of heavy metals increased in soil and *P. glaucum* from 20 to 100 % sugar mill effluent concentrations in both seasons. Biochemical components like crude proteins, crude fiber, and crude carbohydrates were found maximum with 40 % sugar mill effluent in both seasons. The contamination factor (Cf) of various metals were in the order of $\text{Mn} > \text{Zn} > \text{Cu} > \text{Cd} > \text{Cr}$ for soil and $\text{Mn} > \text{Zn} > \text{Cu} > \text{Cr} > \text{Cd}$ for *P. glaucum* in both seasons after fertigation with sugar mill effluent. Sugar mill effluent irrigation increased nutrients in the soil and affected the growth of *P. glaucum* in both seasons. **Conclusions** It appears that sugar mill effluent can be used as a biofertilizer after appropriate dilution to improve yield of *P. glaucum*.

کلمات کلیدی:

Pennisetum glaucum Sugar mill effluent Fertigation Heavy metals Rainy and summer season

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