

## ABSTRACT

Effects of treated effluents from tanneries in Kasur on growth and yield of two cultivars of rice cv.IRRI-6 and cv.KS-282 were studied. Plants were grown in pots for their complete life cycle at Botanic Garden, GC University, Lahore. Two types of effluents i.e. treated and non-treated were analyzed to check the change in quality of effluent before and after treatment. Both effluents were alkaline in nature with higher TSS, BOD, COD, heavy metals like Cr and Pb above NEQS Levels. Although quality of treated effluent much improved after treatment but soil irrigated with this water for full rice growth season showed high EC, SAR, NPK and accumulation of heavy metals like Cr, Mn and Fe. Rate of seed germination and seedling growth was adversely affected by the use of treated tanneries effluent. Reduction in germination percentage, radical and plumule length were observed in different dilutions of treated tanneries effluent and complete inhibition of plumule emergence was observed in 100% effluent. Growth performance of both rice cultivars showed reduced plant height, number of leaves per plant and number of tillers per plant with the increasing levels of effluents concentrations (40-100%) for cv.KS-282 and (60-100%) for cv.IRRI-6, while plants in lower treatments showed better growth as compared to their counterparts irrigated with normal tube well water which served as control. High nutrient contents such as Phosphorus, Potassium and Nitrogen associated with wastewater promoted plant growth in soil irrigated with lower concentration of effluents. However, high TDS, TSS, COD, BOD and heavy metals at high concentration result in reduction in growth parameters. Senescent rate was higher in plants from higher effluent treatments i.e. (80- 100%) compared with plants of lower treatments in both rice cultivars, which were relatively better. Chlorophyll contents were also reduced with corresponding increase in pollution concentrations. Final yield of both rice cultivars showed reduced number of panicles, light-weight seeds with higher seed sterility in plants irrigated with concentrated effluents compared with control. Seed weight was much higher in T5 in IRRI-6 and T4 in KS-282 plants due to better developed seeds as compared with concentrated effluent treatment plants. The growth and yield reductions in most cases were well above 50% in various parameters of cv.KS-282 irrigated with above 40% treated effluent and cv.IRRI-6 irrigated above 60% treated effluent.