

Enhanced reclamation efficiency of *vetiveria zizanioides* at polluted sites compared to experimental pots

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Abstract

Vetiver plants of optimized size (5-leaf stage) were planted at 3 polluted sites (Ditch site soil-DSS, Before effluent entry-BEE and After effluent entry-AEE) besides a control (Irrigated garden soil-IGS). The soil from the respective sites was filled in earthen pots as experimental controls. Interestingly, pot soil (provenance soil) and field (site) soil of BEE and AEE provenances behaved biochemically similarly upto 12 months of 5-leaf vetiver plantation.

The soils exhibited increase in pH and phosphate, decline in CEC, organic carbon and Na⁺, whereas, the nitrogen declined and K⁺ increased in the polluted field soils during 12 months of vetiver plantlet growth. However, the plants behaved almost contrastingly in pots and on site in all soil provenances. Thus, OC, Na⁺, K⁺, Na⁺/K⁺, protein and reducing sugars increased in potted plants whereas reverse was exhibited by on site plants. Only total and non-reducing sugars increased in both site and pot plants. In potted plants, loss of one biochemical component was complemented by increase of the same in the respective soil and vice-versa, but in polluted field (on site) grown plants non-protein nitrogen and non-reducing sugars accumulated indicating a requirement of C-N defence compounds for the plants. The corresponding soils exhibited accumulation of P and K⁺ and decline in Na⁺ reducing the possibility of salinity damage to the plants.

The plants performed better in polluted sites (DSS,BEE and AEE) compared to the pots containing the same soil. Thus, vetiver may be suggested to be planted along contaminated drainage sites