Infiltration control through chemical treatments

Soil compaction with clay materials or lining with concrete, cement, plastic or any other sealants are some of the measures which are widely adapted to prevent water losses from reservoir beds. However due to high cost involved with construction, materials such as polythene, synthetic rubber are widely adapting to cover the beds of small reservoirs. Apart from this a wide range of chemicals such as Sodium Chloride, Tetra sodium Pyrophosphate, Sodium Hexa metaphosphate and Sodium Carbonate have been applied to seal reservoir beds to reduce the infiltration loses. Here the sodium ions cause clay to swell and clay particles to become dispersed and thereby reduce or plug water-conducting pores in the soil. Present research is a pilot study to examine the suitability of sodium chloride application as a low cost measure to prevent bed water losses.

The present laboratory experiment was conducted during 6 th August – 30 th November 1998. Plastic containers filled with Red Yellow Podzolic soils (sieved through 4 mm mesh), were used for the experiment. Soil was compacted evenly and bulk density of the

soil was kept at 1.1 g/ $cm^{3.}$ The experiment had five treatments with three replicates where the rate of application of Sodium Chloride at 4, 6 and 8, 12 Kg/ m^2 was compared with the control.

It was revealed that application of salt at a rate of 4 kg/ m^2 is sufficient to reduce the infiltration rate of the clay loam by about 22 times. Further more the application rate of 4 kg/ m^2 appears to have no implications on surface water salinity. However, salt concentration in leachate was high which could be reduced if sodium replacement is calculated based on the CEC of the soil.

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