SOIL SALINITY AND CROP YIELD TREND ESTIMATION IN RELATION TO TERTIARY LEVEL WATER LOSSES AT FAROOKA RAJBAH OF LOWER JEHLUM CANAL SYSTEM

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ABSTRACT

One watercourse (WC) each at head, middle and tail sections of Farooka Rajbah of Lower Jehlum canal system was evaluated for water losses, soil salinity, water quality and crop yield trends. Seepage rate was determined by ponding method using 2 meter as test length and then seepage losses were worked out for the total watercourse length. Conveyance losses of 4.06, 7.16 and 11.4 Ls^{-1} were recorded for watercourse No. 9500/L (head), 57745/R (middle) and 98802/L (tail) respectively, while the corresponding seepage losses were 1.85, 4.25 and 4.30 Ls^{-1}. Total water losses were higher (32.5%) in WC No. 98802/L with minimum delivery efficiency of 69.43% in contrast to WC N0.9500/L, where total losses did not exceed 16.14% with 83.86% delivery efficiency. It was observed that leakage losses from field outlets were higher than seepage losses from WC No. 9500/L and WC No. 98802/L. The decreased flow at tail (WC No. 98802/L) due to water losses and inequitable water distribution forced the farmers to tap groundwater resource for crop production. Unluckily, groundwater at WC.98802/L was inferior in quality (EC 1.2± 0.3 dS m^{-1}, SAR 8.90± 1.1,RSC 2.90± 0.2 $mmol_c$ L^{-1}) as compared to the WC 9500/L selected at head section of the Rajbah (EC 0.28 ± 0.1 dS m^{-1}, SAR 4.0 ± 1, RSC 0.40 ± 0.1 $mmol_c$ L^{-1}). The ECe and ESP showed an increasing trend from head to tail of the system (2.1 < ECe < 4.2 dS m^{-1}, 6.0 < ESP < 18). General survey on outlets gross area basis shows that 20.4,29.8 and 39.4% area was salt affected in respect of WC. No. 9500/L, 57745/R and 98802/L. On total outlets average basis, the correlations of ECe (r= -0.10) ESP (r=-0.28), Soil P (r= 0.19) and K (r=0.02) with wheat yield were not significant. However, a decreasing trend in crop yields towards tail end of the system was noticed. It is concluded that the exploitation of groundwater resource of marginal quality due to high canal water losses builds up salinity at tail reaches of the system, which ultimately affects the crop yields