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OVERCOMING FOOD SHORTAGE THROUGH IMPROVED IRRIGATION STRATEGY

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ABSTRACT Studies have been conducted during the years 2004-2007 in big lysimeters as well as in the field to tailor strategy for most productive use of available surface and sub-surface water resources. Wheat and maize crops were selected for this trial. The following three irrigation treatments were compared: Irrigation as per Farmer's Practice, Tensiometer based irrigation, No irrigation during entire crop season except heavy pre-irrigation to bring upper 2m soil column at field capacity. Agronomic and cultural practices were followed as per general practice of the area. Tensiometers were installed up to 210cm depth with an interval of 30cm to monitor soil water status at different depths during crop growth period under each treatment. Moisture depletion pattern developed from tensiometer data indicated that the moisture depletion zone for wheat and maize was about 1 meter for treatments (i) and (ii); whereas it extended to more than 2 meters for treatment (iii). Yield data analysis revealed that the crop grain yield and water use efficiency were generally higher in case of treatment (iii) when compared with treatments (i) and (ii). It was further noticed that strew yield had opposite trend. Similar studies were also conducted under field condition at Research and Demonstration Centre of PCRWR situated at Sial More and at four different locations at farmer's fields. The results of these field trials were found inline with findings of lysimeteric studies. Taken together these results it can be concluded that: Present water management practices being followed in Pakistan can further be improved to enhance water use efficiency. The criteria for irrigation applications should be based on water availability in the soil and not on rotational basis at pre-fixed intervals. Rain water, flood water and residual moisture of rice fields if stored in top 2m soil depth can be utilized for successful crop production.

Keywords: Irrigation methods, food shortage, tensiometer, rain water