

Assessment of water application losses through irrigation surveys: a case study of Mirpurkhas subdivision, Jamrao irrigation scheme, Sindh, Pakistan

ABSTRACT

A study was conducted to demonstrate the applicability and efficiency of an irrigation survey method for digging up reliable information to estimate application losses. A sample of 220 tertiary channels was drawn randomly to get information from the growers of the Mirpurkhas subdivision, Jamrao canal irrigation scheme. Pre and post soil moisture status based practical measurements of losses were also carried out at 20 different sites. The results showed that the irrigation methods and soil types have a pronounced effect on application losses whereas crop type has no effect on application efficiency. Drip, sprinkler and furrow irrigation methods showed better performance as compared to other methods (wild flooding, border and basin) used in the study area. The survey based losses results were validated against measured losses whilst values available in literature compared favorably. The overall application losses in the study area were calculated as 23%. The main assumption for the irrigation survey of knowing the irrigation depth (not target depth in accordance with crop actual demand) and cutoff time for a single irrigation event by farmers was almost fulfilled. Based on the encouraging results of this study, it is concluded that irrigation survey studies are useful in understanding the irrigation scheme losses pattern which in turn provide opportunities for improvement.

Keyword: Application losses; Drip; Irrigation survey; Mirpurkhas subdivision; Sprinkler; Surface irrigation methods