

Evaluation and comparison of wheat water requirement with that of calculated in the design booklets of pressurized irrigation systems in arid climate of Orzouieh

Abstract

Determination of crop water requirement and irrigation planning has an important role in sustainable using of water resources. National document of water application for Iran is based on both the studies of experts of the ministries of agriculture, power, and meteorological organization and suggested approaches of F.A.O. and is used as a reference for determination of net water requirement of agricultural and horticultural crops. The mentioned document is prepared based on meteorological data of Synoptic stations of Iran during 25 years include the years from 1970 to 1995. In order to eliminate some deficiencies of the mentioned document and making it suitable for climatic conditions of Iran, it must be updated. The main objective of this research is to evaluate and compare wheat water requirements with that of calculated in the design booklets of pressurized irrigation systems in arid climate of Orzouieh located in Kerman province of Iran. The studies in the area show that the calculated wheat water requirement in the design booklets of pressurized irrigation systems is much lower than that of actual water requirements. Thus, in the present study wheat water requirements are calculated based on meteorological data of the area, using CROPWAT software and the hydromodule of the area were calculated. By comparing the values obtained by CROPWAT and NETWAT (national document) it was concluded that NETWAT underestimates the hydromodule by 51 percent. Then, based on the hydromodule, the volume of consumed water by wheat per hectare during growing season was calculated. By selecting three wheat farms with optimum management and which their consumed water were approximately equal to the calculated hydromodule, physical and economical productivity were estimated according to their yield, costs and revenues. The results of this study showed that the physical productivity is 1.6 kg per each cubic meter of consumed water and economical productivity is 13000 Rials per each cubic meter of consumed water. The results show that supplying the required water for wheat farms and managing them optimally lead to high economical productivity in Orzouieh.

Keywords: Wheat blue need, Hydromodule, Physical Productivity, Economic efficiency.



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