Effects of Different Irrigation Systems on Yield, Some Agronomic Traits, and Water Productivity of Different Wheat Genotypes and Their Economic Assessment in Hamedan

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Abstract

Optimal uses of water resources due to climate change and the recent drought conditions seem to be necessary. One of the most important and effective strategies is using the modern irrigation systems. Therefore, this experiment was conducted in Hamedan Agriculture and Natural Resources Research Center in a split plot arrangement based on a completely randomized block design with three replications. Main plots were irrigation systems (Sprinkler, Tape, and Furrow) and sub plots included wheat genotypes (Alvand, Toos, and two lines C-81-4 and CD-5009). In spite of different amounts of water used in the studied irrigation systems, results showed that grain yield of the evaluated genotypes did not have significant differences in different irrigation systems, although the difference between grain yield in the tape and the furrow irrigation system was around 1000 kg/ha. Also, differences among the evaluated genotypes were not significant. Water productivity in the tape, sprinkler, and furrow irrigation (regardless of effective rainfall), was 1.6, 1.1 and 0.69 kg per unit of water consumption, respectively. Water productivity in tape irrigation increased about 132% and 45 percent compared to furrow and sprinkler irrigation. Economic evaluation, however, showed that sprinkler and tape irrigation systems had economic justification for all of the evaluated genotypes in comparison with furrow irrigation. Besides, sprinkler irrigation had economic preferences in comparison to tape irrigation.

Keywords: Sprinkler irrigation, Furrow irrigation, Tape irrigation, Water productivity.

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