ENERGY USE AND RELATED GREENHOUSE GAS EMISSIONS OF GROUNDWATER-IRRIGATED OIL SUNFLOWER PRODUCTION

Ramazan TOPAK[1], Ramazan CERAN [1]

e-mail: rtopak@selcuk.edu.tr

Abstract

In this study, oil sunflower production irrigated by groundwater was analysed in regards to the energy efficiency and greenhouse gas (GHG) emission. This research was performed at 19 farms growing sunflower under the irrigation area of Konya-Başgötüren town groundwater irrigation cooperative for 2019 vegetation cycle. The farmers applying drip and sprinkler irrigation systems were 6 and 13, respectively and they applied different irrigation levels. In that regard, by grouping farmers in accordance of irrigation methods and irrigation water regimes, separate treatments were obtained. In the context of the research, inputs used, amount of inputs as well as yield were determined individually in the farmer basis. By using unit energy equivalent of inputs and GHG emission factors energy input and GHG emission were determined and were assessed by using the relevant indicators. In results, sunflower production with drip irrigation system was found more successful in regard to the energy productivity. None difference was found between both the irrigation systems in term of the environmental impact. Drip irrigation with 250-350 mm water application was found the most successful in respect to the yield, energy productivity and low GHG emission.

Key words: oil sunflower, groundwater irrigation, energy efficiency, GHG emissions