

Economic Analysis of Production Functions for Canola and Mustard under Deficit Irrigation Conditions in Sistan

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Abstract

In order to estimate the production function of canola and Indian mustard under low irrigation, a factorial experiment was conducted based on completely random blocks in three replications during two growing seasons, 2013 and 2014, in the Agriculture and Natural Resources Research Station of Zahak, Sistan and Baluchistan province, Iran. The tested factors were the irrigation regime at three levels (irrigation after 50%, 70%, and 90% of soil moisture depletion by the plant, SWD); potassium rate at three levels of application (0, 150, and 250 kg potassium sulfate/ha), and their interaction effect on two species of the Brassica genus including oilseed rape (Hyola hybrid 401) and mustard (the native cultivar of India). In this paper, the effects of low irrigation on production functions, costs, profits, and revenue of both Hindi Rape and mustard were investigated. Four types of production function were considered including Quadratic, Traonlog, Cobb-Douglas and Leontieof. And by using econometric tests, the best form of function in terms of its processing fitness in rape and mustard was identified as the quadratic function. The economic analysis results showed that 70% SWD treatment and 90% SWD with application of 250 kg potassium sulfate fertilizer, respectively, had the highest profit in terms of the consumed water and the benefit to cost ratio, so, they were introduced as the superior treatments in production of canola and mustard.

Keywords: Irrigation regime, Quadratic function, Benefit to cost ratio, Benefit per unit of consumed water, Potassium fertilizer.

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