

Consideration of Water Productivity for Farm Water Management in Different Conditions of Water Availability for Dominant Summer Crops

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ABSTRACT- Efficient use of irrigation water for summer crops should be considered seriously due to rare occurrence of precipitation in summer. This research was focused on the assessment of water use efficiency for dominant crops of summer cropping pattern in the study area (i.e., maize and rice) via considering water productivity (WP) with different water management scenarios at farm level at different climatic conditions. Results indicated that in most cases the maximum WP was not occurred at full irrigation scenario. With increasing irrigation application efficiency (E_a), WP increased and the maximum WP shifted toward higher water reduction fraction (WRF). For maize, in deficit irrigation scheduling (DIS) methods with full irrigation at flowering stage, more deficit irrigation application was economically acceptable. For rice, with increasing E_a and WRF, WP increased and deficit irrigation at different growth stages was economically acceptable. Considering the real cost of water, economic water productivity ratio (EWPR) decreased greatly and in surface irrigation system, E_a should be increased and high WRF should be avoided (WRF should be lower than 0.4). In solid-set sprinkler system, EWPR increased with increasing E_a and application of WRF higher than 0.2 (0.2-0.6 for maize) was acceptable. Tape irrigation of maize was acceptable only for WRF less than 0.2; also, 0.2-0.4 was acceptable for WRF by decreasing the E_a .

Keywords: Deficit irrigation scheduling, Economic water productivity, Irrigation application efficiency, Net income, Water cost

INTRODUCTION

In semi-arid areas total precipitation occurs at late fall, winter and early spring and there is no rainfall in summer growing season. Therefore, water consumption in agriculture (main user of limited water resources) should be efficient and managed

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