

Effectiveness of superior techniques on reduction in inlet water to the farm (in Lake Urmia Basin)

The project "Contribution to Lake Urmia restoration via local community participation in sustainable agriculture and biodiversity conservation" as one of the Conservation of Iranian Wetlands Project (CIWP) with cooperation of Iran's Department of Environment and Ministry of Jihad Agriculture and financial support of the Government of Japan has attempted to provide part of Lake Urmia's water requirement through social responsibility promotion, local communities empowerment, training and participation of local farmers and establishment of sustainable agricultural techniques at farm level. While paying attention to preserving the interests and income of farmers, the project has attempted to reduce water consumption at farm level and increase water productivity through changes in common agricultural practices. Techniques such as change in tillage methods, plots size correction, application of winnowed seeds and seeds with a shorter growth period and modification of crop fertilizer management can be considered. In order to measure the effectiveness of the techniques and determine the most appropriate ones, selected farms were choosed in Urmia, Nazluchai, Salmas, Miandoab and Mahabad.

The effectiveness of techniques was evaluated using farm water efficiency (Ea), yield (Yc), water productivity (WP) and water use efficiency (WUE). Techniques of irrigation pan around the trees and irrigation with low pressure tubes reduced the applied water use significantly in the apple orchards of Barandoz Chai focal area. In tomato fields using transplant method irrigation number decreased at least one time during the crop growth period and inn other tomato fields, less water applied due to the changes in irrigation systems through application of surface to drip-tape and improvement in on-farm management recommended by local experts.

The fields were closed at the end and didn't have surface runoff. Penetration of water in farms is varied based on farmer irrigation management and soil texture and the highest amount of penetration was measured in the early stages of growth. The highest percentage of penetration depth was measured 28% in barley farm. In two fields of barley with the same irrigation levels, the depth of penetration was higher in a field where the soil texture of the root zone was sandier. The penetration level in wheat fields was measured 24 to 26 percent of irrigation and rainfall. In comparison of water entrance level to farms, there was no a specific trends between treatments and control fields and an average of zero to 50 percent decrease in applied

water was observed. Techniques applied in all treatment fields have led to an increase in the yield compared to the control ones. In most of the fields, increase in water use efficiency and water productivity were measured which is linked to the design and implementation of the techniques proposed. Effective techniques for reducing water entrance to fields and improving agricultural water productivity were as follows: furrow planting installing traps, adjustment of plots length and width, spraying with bio-fertilizer, weed control, fertilizer regime, no/low tillage, land leveling, crop residue from previous year, transplant planting, irrigation pan around the trees, conservation agriculture and pheromone trap.

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