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WATER AND FERTILIZER CONSERVATION BY IMPROVED IRRIGATION METHODS

M.Rafiq Choudhry, A.D.Choudhry, Saud Akbar, M.Iqbal & M.Asif*
Faculty of Agri. Engineering and Technology,
University of Agriculture, Faisalabad
*Af. Sc. Student, Department of Agronomy

Efficient use of scarce water resources through improved irrigation techniques has been the focus of investigations during the past two decades. Furrow-bed method ofirrigation no doubt saves significant quantitiesof water and improves the fertilizer use efficiency through line source application, determination of optimum bed width as well as optimum fertilizer application is needed for improving wheat yields. Bed widths of 60, 80 and 100 cm and nitrogen fertilizer doses of 75, 112 and 150 kg/ha were tested for water and fertilizer conservation. The study showed a water saving of 34, 43 and 48% from 60. 80 and 100 cm beds, respectively. as compared to flat borders. The optimum width was found to be 80 cm and nitrogen fertilizer dose of 112 kg/ha for maximum yield of wheat crop.

INTRODUCTION

Irrigation system in Pakistan operatesto supply less than 70% of the crop water demand (Ministry of Food, Agriculture and Coopera- tives, 1984). Efficient utilization of available supplies is not only important to bridge the gap of water deficiency but also to maintainadesir- able salt water balanceintherootzone. Thefield data collected by Kemperet al. (1975) showthat when an over-irrigation is applied by flooding water over the entire field area, the nitratesleach down from the plant rootzone resulting inloss of fertilizer and deterioration of groundwater quality, This is primarily because of indigenous techniques of planting and irrigation. Efficient use of fertilizer is also strongly associated with the method of its application. Choudhry and Qureshi (1991) have shown that furrow-led method of irrigation saves about 35 to 50% of irrigation water as compared to border irrigation. Their findings were based upon a bed width of 75 cm both for cotton and maize crops. The water saving of water as well as the crop yields may, however, be influenced by the bed width and number of beds per acre.

Greater width of beds may result in smaller number of beds and hence may reduce the crop yields, while too small width of bed may increase the number of furrows off setting the water savings. Although the efficiency of fertilizer use improves by line application through beds, the distribution may be significantly affected by the width and number of beds. Therefore, it was considered important to be investigated with the following objectives:

1. To determine the feasibility of growing wheat on beds.
2. To determine the response of wheat crop to different levels of water and fertilizer interaction under furrow-bed irrigation.
3. To determine the optimum bed width and use of nitrogenous fertilizer for wheat crop.

METHODOLOGY

The study was carried out on farmers fields. Completely randomized block design was used to tesi three bed widths (60. 80 and 100