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THE CROP AND NITROGEN YIELDS OF WHEAT AS INFLUENCED BY SINGLE AND SPLIT FERTILIZER N APPLICATION

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ABSTRACT

The effects on irrigated wheat of N fertilizer applications as a single or two split doses were compared at the farmers' field in NWFP. Three levels of N viz. 40, 80 and 120 kg N ha^{-1} were applied to soil either as full dose at sowing or in two equal splits- one at sowing and the other with second irrigation. A control treatment receiving no N was also included. The yield and N content of wheat increased gradually with increasing levels of N addition. Although the grain yield was increased by the split application, the differences between split and no-split treatments were not significant. The DM yield was increased significantly by the split treatment, the effect varying with the level of N addition. The total crop N and the recovery of applied N by wheat plants increased by the split treatment, the differences between split and no-split treatments however were not significant.

INTRODUCTION

The yield of wheat and other cereals in North West Frontier Province of Pakistan is limited by the supply of soil N, and hence fertilizer N must be applied to ensure optimum yields (Shah *et al.*, 1993; Shah *et al.*, 1995) Unfortunately, the N fertilizers are not only expensive but inefficiently utilized. It has been reported that the apparent recovery of applied N by the crop seldom exceeds

Recovery of fertilizer-N by irrigated wheat grown on red-brown earth was higher when applied at or near heading than that when applied at sowing (Smith and Freney, 1988; Smith *et al.*, 1989b). Between 50 and 70% of the post sowing N applications were recovered in the crops (Smith *et al.*, 1989b; Smith *et al.*, 1991) compared to less than 40% when the N was applied at sowing (Smith and Gyles, 1989; Smith *et al.*, 1989a). The fertilizer N is used more efficiently when the supply of available N in the soil is matched with the demand for it by the crop (Myers, 1987).

The purpose of this research work was to assess whether the split application of fertilizer N can help in reducing N losses and improving fertilizer use efficiency and wheat productivity on a silty clay loam soil of Peshawar valley in NWFP.

MATERIALS AND METHODS

A field experiment was conducted to evaluate the effect of split application of N fertilizer on yield and N content of wheat at the farmers' field in Mardan SCARP area of NWFP. The experimental site was situated about 10 km east of Charasadda on the Mardan-Dosera Road. Before sowing, composite soil samples at 0-15, 15-30, 30-60, 60-90, and 90-120 cm depths were taken from