

Effect of tillage systems and weed control methods on weeds, yields and economics of wheat (*Triticum aestivum*)

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A field experiment was conducted during the winter season of 2006-07 to study the effect of tillage practices (Zero and conventional tillage) and six weed control methods against weedy check on yield, weed dynamics and economics of wheat grown in rice-wheat sequence. Zero tillage increased the weed intensity by 20.3% reduced the grain yield by 4.2% net profit by 2.8% compared to conventional tillage. Among weed control methods, Pendimethalin @ 500 g a.i./ha + one hand weeding being at par with 2, 4-D @ 500 g a.i./ha + Isoproturon @ 500 g a.i./ha produced significantly higher grain and straw yield than other weed control methods. These yields were attributed to higher growth and yield attributes in above weed control methods. The application of pendimethalin @ 500 g a.i./ha + one hand weeding showed highest weed control efficiency of 76.89% and gross income of Rs. 58864/ha. However, net profit was maximum of Rs. 35675/ha under application of 2,4-D @ 500 g a.i./ha + Isoproturon @ 500 g a.i./ha closely followed by pendimethalin @ 500 g a.i./ha + one hand weeding with Rs. 35130/ha. Single application of 2,4-D or Isoproturon or Pendimethalin at recommended doses reduced the yields and profit than combined application of any two herbicides at half of the recommended dose.

Key words : Tillage, Wheat, Herbicides, Weeds, Yield, Economics

INTRODUCTION

Rice-wheat cropping system is predominant in Indo-gangetic plains covering an area of 10.5 million ha. In this system, sowing of wheat is some times delayed because of late harvest of rice crop due to one or the another reason. It caused reduction in yield of wheat. To advance the sowing of wheat under such condition zero till ferti-seed drill has been advised by some of the research workers. Zero tillage is suitable for economizing time and energy that is needed for sowing wheat following the rice crop. In this method of wheat sowing, intensity of weeds in wheat crop may increase compared to conventional tillage which reduces the weeds infestation upto some extent. Generally, wheat fields are infested with both grassy and broad leaved weeds, thus weed control is basic requirement for optimum utilization of essential inputs. In view of the above, the present study was undertaken on tillage systems and weed control methods in wheat grown after rice in sequence.

MATERIALS AND METHODS

A field experiment was conducted at Students' Instructional Farm of C.S. Azad University of Agriculture and Technology, Kanpur during *rabi* 2006-07 on sandy loam soil having 0.43% organic carbon, 13.5 kg/ha available P₂O₅, 190 Kg/ ha available K₂O and 9.2 soil

pH. The treatments comprised of two tillage systems (T₁- zero tillage, T₂-conventional tillage) and 7 methods of weed control (Mo - weedy check, M₁ - Isoproturon @ 1Kg a.i./ha, M₂ - 2,4-D @ 800 g a.i./ha, M₃ - 2, 4-D @ 500 g a.i./ha + Isoproturon @ 500 g a.i./ha, M₄ - Pendimethalin @ 1 litre a.i./ha, M₅ - Pendimethalin @ 500 g a.i./ha + one hand weeding, M₆ - Hand weeding at 30 DAS). Split plot design was used with tillage systems in main plots and weed control methods in sub-plots, all replicated 4 times. An uniform dose of 150 Kg N + 60 Kg P₂O₅ + 40 Kg K₂O/ha was applied in all treatment plots. In the plots of zero tillage, direct seeding was done while in conventional tillage one ploughing with tractor harrow followed by two cross ploughing with tractor tillars were done for field preparation. Wheat variety 'Halan' was sown with 125kg seed/ha on 6.12.2006 at 22.5 cm row spacing using zero till machine. Herbicides were applied through sprayer as per emergence (pendimethalin) and post-emergence (Isoproturon and 2,4-D) in different cases. Experimental crop was raised under irrigated condition with recommended package of practices. Crop was harvested on 26-4-2007 at full maturity.

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below: