

Effect Of Different Tillage Systems On Yield Of Wheat Crop

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ABSTRACT

In intensive agricultural production system, the time available for seedbed preparation of wheat after paddy harvesting is very limited. The total turn around time is only 10-15 days; therefore delay in any operation will result into late sowing of wheat which may cause poor crop establishment, leading to poor yield. The study was conducted to see the effect of different tillage systems viz. conventional tillage, minimum tillage system and zero-tillage system on crop establishment and production of wheat crop after the paddy harvesting. The different treatments adopted for the study and it was observed that there was no effect of stubble on the performance of zero-till ferti seed-drill. However, the loose straw spread on the surface offers some hindrance in the working of the drill. The zero tillage sowing was found to be most time (88%) and energy efficient (79%) as compared to conventional method of sowing. Wheat crop can be sown 10-15 days early as compared to conventional method of sowing. This will result in timely sowing of wheat crop and increase in yield. The zero tillage sowing was more economical (79%) in comparison to conventional method. Thus zero-till ferti seed-drill system was found most economical and gave highest benefit cost ratio than conventional wheat crop raising system and other tillage systems.

Key words: Zero-tillage, sowing, wheat, yield

INTRODUCTION

Rice-wheat cropping system is very common in India. It contributes to over 70% of total food grain production in the country with an area of 12 Mha under this cropping system. It is necessary that production of rice and wheat must keep pace with the growing population of our country. Delay sowing due to presence of crop residue reduced crop yield of 30-40 kg per ha per day Baranwal (1995) and Hobbs (1988) if crop is sown after mid Nov. This loss can be saved through early seeding of wheat by no tillage techniques. This technique advances the sowing operation by 10-15 days and also reduce the cost of production by saving energy. The zero tillage technique also improves the soil environment for crop growth, reduces erosion, conserves the time and energy and decreases the cost of farming Edminikster and Miller, (1959). Keeping above in view, study was conducted to see the Performance evaluation of zero till ferti seed drill with conventional and reduced tillage method by sowing of wheat and study of economy and energy consumption in zero-till ferti seed-drill in comparison to conventional system.

MATERIALS AND METHODS

The Pantnagar zero-till ferti-seed drill was developed by the G.B.Pant University of Agriculture and Technology, Pantnagar, (Uttaranchal) India. Pantnagar zero-till ferti seed drill was made of mild steel angle iron of size 68.0 x

68.0 x 8 mm with square cross-section. Spacing between two furrow openers was 22.5 cm having nine furrows. The seed and fertilizer box of existing zero-till ferti seed-drill was made by using mild steel sheet. The capacity of seed and fertilizer boxes was 50 and 40 kg, respectively. The angle of repose provided in seed and fertilizer boxes were about 23 to 28 degree and 62 degree, respectively. The seed metering device used in drill was of fluted roller type having 10 numbers of grooves fitted in 16mm size shaft. These rollers are especially suitably for seeding wheat crop the metering mechanism for fertilizer was of hole mesh type. Star type agitators were provided in the fertilizer box to avoid bridging of fertilizer. The special feature of the Pantnagar zero-till ferti seed-drill was that it utilizes a different type of furrow opener termed as inverted -T type furrow opener which makes slit in untilled soil without much disturbing it. The blade of furrow opener was made of 8mm thick mild steel plate having hardness of 116RHN. The rake and relief angles had been kept at 20 degree and 5 degree, respectively. The power to the seed and fertilizer metering device is transmitted through a 380 mm dia. lugged ground drive wheel and chain sprocket system. The zero-till ferti-seed drill was field evaluated in comparison to different tillage and seeding systems for raising wheat crop during the Rabi season over an area of 0.20 ha. The average height of paddy stubbles was 5.03

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