Pakistan Journal of Applied Sciences 2 (3): 307, 2002

Zerotillage Sowing Method of Wheat Followed by Transplanted Rice (In Rice–Wheat System)

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Abstract: This study was conducted at the Rice Research Institute Dokri for three years from Rabi 1997-98 to 1999-2000. The object of this study was to compare zerotillage-sowing method of wheat with conventional method for grain yield and net benefit. Zerotillage sowing method gave 8.30 % more yields than conventional method. Moreover tillage cost was reduced up to 8 % while increase in net benefit 28 % was achieved. Economically zerotillage-sowing method proved better with CBR 1.25 than conventional method with CBR 0.926.

Keywords: Zerotillage Sowing Method, Conventional Sowing Method

Introduction

The area under wheat in Pakistan is 8.463 million hectares giving production of 21.078 million tones with average yield of 2490 kg ha^{-1} and rice is 2.515 million hectares giving 5.155 million tones production with an average yield of 2050 kg ha^{-1} (1999-2000). In Rice-Wheat system in Pakistan particularly in Sindh any delay in wheat sowing after the November results loss in yield. Late sowing of wheat due to late harvesting of rice crop or the long time needed for land preparation. Research conducted on zerotillage was fundamental to enhance productivity and sustainability of Rice-Wheat cropping system in Sindh, so that national and international demand is met. The expenditure incurred on land preparation and yield losses due to late sowing of wheat emphasized to conduct research on zerotillage to lower the cost of cultivation.

Nayyar *et al* (1998) reported that planting of wheat after rice under zerotillage method in comparison of conventional method gave significantly more grain yield of 20.16 % than conventional method. Moreover tillage cost was reduced upto 98 % while 77 % increase in net benefit was achieved.

In Rice-Wheat system of South Asia any delay in wheat planting after the end of November results in 1-1.5 % loss in yield per day delay. Late planting can result from late sowing of the previous crop or the long time needed to prepare suitable seedbed. To reduce that problem zero and reduced tillage options have been introduced to farmers of the region (Ortiz-Monasterio *et al*, 1994). Regmi (1996) found that wheat yields declined because of delay in planting.

Materials and Methods

Zerotillage v/s conventional sowing method experiment was conducted on an area of 0.5 acres at Rice Research institute Dokri for three years from Rabi 1997-98 to 1999-2000. Sowing of wheat crop was done in the 2nd week of December. In zerotillage treatment no land preparation was done seed was drilled in standing rice stubbles when land came in condition. While in conventional method treatment land was prepared with two cultivator cross plowings and seed was mixed with third cultivator plowing. The wheat variety tested was TJ 83 (Tando Jam 83). The fertilizer was applied as per recommended dose i.e. 134 - 67 - 0 NPK kg ha^{-1} and three irrigations were given to the crop throughout growing period.

Results and Discussion

In comparison of zerotillage-sowing method and conventional sowing method, higher average yield of 3250 kg / ha was recorded under zerotillage, whereas the yield of 3001.65 kg / ha was obtained under conventional sowing method. Moreover, tillage cost was reduced upto 8 %, while 28 % increased net benefit was achieved.

So economic point of view zerotillage sowing method proved better than conventional method, the expenditure / income is shown on Table 2.

Table 1: Yield (kg / ha)

Sowing Method	1997-98	1998-99	1999 -2000	Average
Zerotillage	3333	3167	3250	3250.00
Conventional	3167	2778	3060	3001.66

Table 2: Cost Benefit Ratio

Sowing Method	Expenditure / Inputs(Per ha.)	Income (Per ha.)	Cost Benefit Ratio
Zerotillage	9392.00	21125.00	1.249
Conventional	10142.00	19540.00	0.926

Conclusion

Based on the above findings the following conclusions could be drawn.

- In rice – wheat system, zerotillage-sowing method is more beneficial than conventional method
- Expenditure incurred on land preparation can be saved by involving fewer amounts on land operational cost without any yield reduction.
- Irrigation water can also be saved by zerotillage method of sowing.

References

Nayyar, M. M. Muhammad and N. Randhava, 1998. Ayub Agricultural Research Institute, Faisalabad.

Ortiz Monasterio J. I and Dhillonmm Fisher R. A., 1994. Date of Sowing, Effect on Grain Yield, and Yield Components of Irrigated Cultivars and Relationships with Radiation and Temperature in Ludhiana, India.

Regmi A. P., 1996. Long-term Soil Fertility Trial under Rice –Wheat Rotation. Paper at National Workshop Khumaltar, Nepal.