

Effect of Zero Tillage Ferti Seed Drill and Weedicides on Seed Yield of Wheat (*Triticum aestivum* L.)

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Abstract

On farm trials (OFT) conducted during 2001-02 and 2002-03 revealed that in the late condition, sowing of wheat crop (cv HUW 234) with zero-tillage-ferti-seed drill in combination with pre-emergence spraying of pendimethalin (1.5 kg/ha) significantly increased the seed yield upto 49.92 q/ha and 48.67 q/ha at 5 and 1% level of significance in 2001-02 and 2002-03, respectively. The net income and C : B ratio of this treatment were Rs 23147 q/ha and 1 : 9.08, respectively. The second significant treatment was post-emergence spraying of isoproturon and 2, 4-D in the farmers practices which increased the seed yield of wheat crop up to 39.36 q/ha and 28.35 q/ha with 8.84 and 1 : 3.77 C : B ratio in both the years of trials.

Key words : Zero tillage, Conservation tillage, Weedicide, Net income, C : B ratio.

Wheat is an important cereal crop of Indo-Gangetic plain zone of irrigated condition where rice-wheat cropping system exists. In India it occupies nearly 24.8 mha through which 65.4 m.t. of wheat produced. Mirzapur district covers nearly 1.14 lac ha of land under which 2.5 lac tons of wheat produced but the productivity is low (18.95 q/ha). On farm trials have been conducted in Karhat village of Jamalpur block which falls under Mirzapur district. A village transect survey shows that people of this district have poor socio-economic condition. They are not able to manage their crop properly.

After village survey the following causes are found for low yield of wheat : It takes long duration of rice variety which is harvested in late or waiting for tilth position of soil after harvest of rice crop ; late release of irrigation water during rice-nursery period from reservoir and canal and also less availability of electricity ; less availability of labors during peak period of rice cultivation ; not uses any weedicide for controlling weeds particularly *Phalaris minor*. Uses higher seed rate (150—200 kg/ha) ; not uses recommended wheat varieties.

Zero /conservation tillage acts as a remedy under late condition. The residual moisture after the rice harvest is used for sowing the wheat crop. This process is in advanced by 5—10 days (time taken for reaching the soil at tillage stage) ; seed and fertilizer are reduced up to 25% and water 10 to 40% ; the

problem of weed (*Phalaris minor*) exists. The weed seeds lying at lower depth cannot be removed without ploughing. Taking these into consideration on farm trial was conducted during 2001-02 and 2002-03.

(The author is grateful to Indian Council of Agriculture Research, New Delhi for granting the found under on farm testing head).

Methods

On farm trial was conducted during 2001-02 and 2002-03 in *rabi* season on HUW 234 variety of wheat crop. The soil was clayey in nature. There were four treatments for the trial i.e., Farmer's practice : in this practice they broad cast their seed in ploughed field at 150—200 kg/ha. They do not adopt any weedicidal treatment for controlling weeds (*Phalaris minor*, *Cynodon dactylon*, *Cyprus rotundus*, *Melilotus alba*, *Lathyrus aphaca* and *Chenopodium album*). Three irrigations were given first after 17 days of sowing and the rest at, jointing and flowering stages of crop growth ; Farmer's practice + weedicide (isoproturon) at (750 g/ha) ; Farmer's practice + isoproturon (750 g/ha) + 2,4-D (400 ml/ha) ; and Zerotillage + pendimethalin (1.5 kg/ha).

Total field was divided in 5 replications where each replication had four treatments. The soil of the field was clayey in nature with pH 7.3. Total treatments were 20 with 0.4 ha of area. The seed was treated

Table 1. Zero-tillage ferti seed drill and weedicidal response on the seed yield of wheat crop. Net income calculated at Rs 500/q (2001-02) and Rs 514/q (2002-03).

Treatments	Seed yield (q/ha)			Increase (%) in yield over + farmers method		
	2001-02	2002-03	Av.	2001-02	2002-03	Av.
1 Farmer's practice	24.33	22.06	23.19	-	-	-
2 Farmer's practice + weedicide (isoproturon)	32.66	25.63	29.14	34.23	6.18	20.20
3 Farmer's practice + weedicide (isoproturon + 2,4-D)	39.36	28.35	33.85	61.77	28.41	45.09
4 Zero-tillage + weedicide (pendymethalin)	49.92	48.67	49.29	105.17	120.02	112.59
5 SE ±	0.302	0.458	0.378			
CD at 5%	0.93	1.41	1.17			
CD at 1%	1.30	1.98	1.64			

Table 1. Continued.

Treatments	Net income (Rs/ha)			C : B ratio		
	2001-02	2002-03	Av.	2001-02	2002-03	Av.
1 Farmer's practice	10165	11339	10752	5.08	3.77	4.42
2 Farmer's practice + weedicide (isoproturon)	14330	13159	13744	7.16	3.10	5.13
3 Farmer's practice + weedicide (isoproturon + 2, 4-D)	17680	14327	16003	8.84	3.77	6.30
4 Zero-tillage + weedicide (pendymethalin)	22960	23335	23147	11.66	6.50	9.08
5 SE ±						
CD at 5%						
CD at 1%						

with vitavax at 2.5 g/seed to avoid losses from the birds and fungal infestation. As it is known that after zero-tillage sown seeds are left open. Therefore, there is need to use chemical to check losses by birds after seeding. The randomized block design was followed for the trial. The crops were sown on 7 December 2001-02 and 9 December 2002-03 and harvested on 3 April 2002 and 7 April 2003, respectively. Three irrigations were given first at 19 days after sowing, and second and third at jointing and flowering stages.

Results and Discussion

Seeding of wheat crop after 15 December reduces the yield by 30 kg/ha per day (1). The farmers practice recorded 23.19 q/ha of seed yield when it was broadcasted just after preparation of field. In the second treatment the weedicides i.e. isoproturon was sprayed at the rate 750 g/ha in 500—600 liter/ha of water after

30 days of sowing and this treatment achieved upto 29.14 q/ha of yield which was 20% higher as compared to previous treatment. Tubbs and Gallaher (2) conducted an experiment on peanut and sprayed post-emergence paraquat plus acifluorfen plus bentazone and imazapic and found 18—52% greater control in weed infestation. When isoproturon sprayed with 2,4-D in the farmer's practices the seed yield was significantly increased in both the years as compared to isoproturon sprayed separately.

When wheat crop was sown with zero tillage ferti seed drill device in combination with pendimethalin pre-emergence weedicide the seed yield was increased significantly as compared to farmers practices either with single weedicide (isoproturon) or with double weedicide isoproturon + 2, 4-D. This data were supported by Mishra (3). This treatment recorded an average 112.59% higher yield as obtained by farmer's practice. The net income was Rs 23, 147/ha with 9.08

C : B ratio. Sharma et al. (4) also emphasized the late wheat crop sowing with zero conservation tillage in interaction with mulching or residue management for better soil environment over a period.

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