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Economics of production of Wheat in Wardha District

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Abstract
The present study was undertaken in Wardha district of Vidharbha region. From each tehsil two villages were selected purposively, on the basis of highest area under wheat cultivation. From each village 20 farmer were selected randomly. At overall total 120 farmers were selected for present study. The selected 120 farmers were under sequently classified as small (up to 2), medium (2.01 to 4.00) and large (4.0 to above) on the basis of size holding. Per hectare cost of cultivation of low adopter at cost 'A', cost 'B' and cost 'C' were Rs.23200.19, Rs.31820.44 and Rs.34624.67 respectively. Per hectare cost of cultivation of medium adopter at cost 'A', cost 'B' and cost 'C' were Rs. 25758.81, Rs.34974.44 and Rs. 42680 respectively. Per hectare cost of cultivation of high adopter at cost 'A', cost 'B' and cost 'C' were Rs.29185.95, Rs.38707.18 and Rs.43922.71 respectively. Per hectare cost of cultivation of overall adopter at cost 'A', cost 'B' and cost 'C' were Rs27312.29, Rs.35611.35 and Rs.39700.51 respectively and gross return was Rs. 52849.50. At overall level the B:C ratio at cost 'C' was 1.31.

Keywords: Economics, production, wheat, cost, cultivation, farmers, yield gap

Introduction

Wheat (*Triticum spp.*) is the most important food crop in India, in terms of consumption, production and cultivated area. Wheat is the world's most widely cultivated food crop. It is also known as king of cereal. There are three important species of wheat viz; *Triticum aestivum, Triticum dicoccum and Triticum durum*. It has the broadest adoption of all cereals crop species. The area sown under this crop is the largest among the area under various cereal crops. It is originated in South West Asia grown across a wide range of environment around the world and established itself as a leading crop in U.S.A. and Canada. It is eaten in various farms by the people all over the world and it makes a big contribution to the calories and protein available to man than any other food crop. In India wheat is grown on 29.64 million hectare with total production of 92.64 million tones and productivity of wheat is 3.12 t/ha. In Maharashtra, during 2012-2013 wheat is grown on 594 million hectare with total production of 875 tones and productivity of wheat is 1473 kg/ha. Globally, India is the second largest producer next to China with maximum area under wheat. The most wheat producing countries of the world are U.S.A., China, India, Russia, Pakistan, Canada, Argentina, Germany, France and Australia. Main wheat producing states are Punjab, Haryana, Uttar Pradesh, Rajasthan, which are located in the Northwestern zone of India. The prosperity of people in any predominantly agrarian country largely depends upon the progress of agriculture.

Materials and Methods

The present study was undertaken in Wardha district of Vidharbha region. The district was selected purposively. From each tehsil two villages were selected purposively, on the basis of highest area under wheat cultivation. From each village 20 farmer were selected randomly. At overall total 120 farmers were selected for present study. A schedule was designed for data collection by keeping the objectives of study, in view. The data pertaining to the year 2013 - 2014 on various aspect of Wheat cultivation, economics of production and other relevant information were collected.

Results and Discussion
1. per hectare input utilization for Wheat crop
The farmer required to spend on various input like seed, manure, fertilizer, human labour and bullock labour.

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Therefore, it is necessary to know the pattern of expenditure on various input on per hectare basis. The per hectare input utilization for a Wheat crop is presented in Table 1 that, high adopter group in physical the seed requirement is higher as compared to other group. At overall level the quantity of seed is 97.98 Kg/ha. Highest manure was used by high adopter farmer (4.69 Qt /ha).

At overall level the quantity of human labour was 57.64 days used for production of Wheat crop. At an overall level 178.61 Kg/ha fertilizer was used. Highest fertilizer used by high adopter farmer (182.47 Kg/ha) followed by medium (179.26 Kg/ha) and then low adopter group (175.37 Kg/ha). Among the different size group, the highest human labour was utilized by medium adopter group (75.92 days) whereas lowest human labour was used by high adopter group (71.26 days).

Table 1: Input utilization pattern of sample farmers (Physical quantity)

S. No	Particulars	Low adopter	Medium adopter	High adopter	Overall adopter
1	Seed (kg)	96.77	97.63	98.36	97.98
2	Manure (Qt)				
3	Fertilizer (kg)	3.39	4.21	4.69	3.24
	N	97.99	98.08	99.21	98.26
	P	46.38	47.03	47.83	48.35
	K	31.00	34.15	35.43	32.00
4	Hired Labour (days)				
	a. Male	14.00	15.00	19.05	16.20
	b. Female	14.92	16.50	22.05	18.14
5	Family Labour (day)				
	a. Male	22.10	21.18	14.02	12.30
	b. Female	23.17	23.24	16.14	11.00
6	Bullock Labour(day)				
	a. Hired	2.86	3.20	3.36	3.45
	b. Owned	2.06	3.00	3.10	2.30
7	Machine (Hours)				
	a. Hired	2.06	3.64	4.96	2.34
	b. Owned	0.28	0.42	0.65	1.15

(Figures in parentheses indicates the percentage to the total)

2. Per hectare cost of cultivation of wheat

The share each item the total cost provides necessary due to economizing cost. The cost is determined on the basis of standard cost concept i.e. cost 'A', cost 'B' and cost 'C'. The different cost concept have different utilities in research. Here an attempt has been made to estimate the figures of cost of Wheat crop in the study area and presented in succeeding Tables. The per hectare cost of cultivation of wheat at overall level is presented in Table 2.

It is revealed from the Table 2 that, per hectare cost of production at cost 'A', cost 'B' and cost 'c' were Rs.27312.28, Rs. 35611.34 and Rs. 39700.50 respectively. The major share of cost of cultivation goes towards cost 'A' (68.80 per cent). In cost 'A' share of hired human labour were 15.02 per cent, fertilizer 13.63 per cent, bullock labour 10.14 per cent, seed 9.75 per cent, machine hours 3.07 per cent, irrigation 2.55 per cent and plant protection 2.03 per cent indicating that, all the above input are cash input for which farmer required to pay immediately from his pocket. Cost 'B' contributes to 89.70 per cent. The share of family labour was 10.30 per cent.

Table 2: Per hectare cost of cultivation of Wheat for overall adopter

S. No	Particulars		Units	Unit required	Price per unit	Cost in Rs.	Per cent to total
1	Hired Human Labour	Male	DAYS	16.2	200.1	3241.62	8.17
		Female	DAYS	18.14	150	2721.00	6.85
		Total	DAYS	34.34	173.63	5962.62	15.02
2	Bullock Labour	Hired	DAYS	3.45	700.12	2415.41	6.08
		Owned	DAYS	2.3	700.1	1610.23	4.06
		Total	DAYS	5.75	700.112	4025.64	10.14
3	Machine	Hired	DAYS	2.34	349.00	816.66	2.06
		Owned	DAYS	1.15	349.20	401.58	1.01
		Total	DAYS	3.49	349.07	1218.24	3.07
4	Seed		KGS.	97.98	39.50	3870.21	9.75
5	Manure		QTLS.	3.24	202.00	654.48	1.65
6	Fertilizer	N	KGS.	98.26	27.50	2702.15	6.81
		P	KGS.	48.35	32.50	1571.38	3.96
		K	KGS.	32.00	35.50	1136.00	2.86
		Total				5409.53	13.63
7	Irrigation	Cost	RS.			1012.00	2.55
8	Incidental	Cost	RS.			687.00	1.73
9	Plant protection	Cost	RS.			806.90	2.03
10	Repairs	Cost	RS.			912.00	2.30
11	Depreciation	Cost	RS.			1012.00	2.55
12	Land Revenue	Cost	RS.			158.47	0.40
13	Int. On Working Capital	Cost	RS.			1583.20	3.99
14	COST "A"		RS.			27312.28	68.80

15	Rental Value Of Land		RS.			7000.2	17.63
16	Int. On Fixed Capital		RS.			1298.86	3.27
17	COST "B"		RS.			35611.34	89.70
18	Family Human Labour	Male	DAYS	12.3	199.2	2450.16	6.17
		Female	DAYS	11	149	1639	4.13
		Total	DAYS	23.3	175.50	4089.16	10.30
19	COST"C"		RS.			39700.50	100
20	Yield	Main	QTLS.	23.1	2245.00	51859.00	
		Bye	QTLS.	10	99.00	990	
21	Value Of Total Produce		RS.			52849.50	
22	Per Qt. Cost Of Production					1675.77	

(Figures in parentheses indicates the percentage to cost C)

The per hectare yield obtained by overall adopter was 23.1 quintal with gross return of Rs.52849.50. In case of overall adopter the per quintal cost of production was Rs.1675.77.

3. Estimation of yield gap in Wheat production
The study was undertaken with the overall objectives of estimating the yield gap in Wheat production, the result obtained are presented in Table 3. The yield performance of Wheat under different field situation. It could be observed from the table 3. that there existed a sizeable gap in the Wheat productivity between the research station, demonstration plots and the sample farmer's field.

Table 3: Estimation of yield gap in Wheat production (Value in Kg/ha)

Sr. No.	Particulars	Yield
1	Potential yield (Yp)	3500
2	Potential farm yield (Yd)	3214
3	Actual yield (Ya)	
	Small	2253
	Medium	2420
	Large	2634
	Overall	2500
4	Yield gap-I (Yp-Yd)	286
5	Yield gap-I (Yd-Ya)	
	Small	961
	Medium	794
	Large	580
	Overall	714
6	Total Yield Gap (Yp-Ya)	
	Small	1247
	Medium	1080
	Large	866
	Overall	1000

It is observed from Table 5.9 that, Wheat yield realized on the research station (3500 Kg/ha) and on demonstration plots (3214 Kg/ha) was sufficiently higher than farmer field (2500 Kg/ha). Higher yield level on research station and demonstration plots were attributed to the fact that the experiments were conducted on scientific lines and are equipped with all the requisite resources including the technical input on the research station, while the demonstration trial are carried out under the supervision of agricultural extension workers.

The magnitude of total yield gap worked out to be 1000 kg/ha. This comprises of relatively higher magnitude of Yield Gap-II (714 kg/ha) than Yield Gap-I (286 kg/ha). The higher magnitude of Yield Gap-II may be attributed to the significant environmental differences and partly to the non- transferable components of technology like cultural practices (like differences in taking up of timely land preparation, maintaining optimum plant spacing and density, plant nutrient application, plant protection measure etc.) between the demonstration plots and research station.

Conclusion
On the basis of results obtained from the study, following conclusions are drawn. Per hectare cost of cultivation of overall adopter at cost 'A', cost 'B' and cost 'c' were Rs.27312.28, Rs. 35611.34 and Rs. 39700.50 respectively. The major share of cost of cultivation goes towards cost 'A' (68.80 per cent). In cost 'A' share of hired human labour were 15.02 per cent, fertilizer 13.63 per cent, bullock labour 10.14 per cent, seed 9.75 per cent, machine hours 3.07 per cent, irrigation 2.55 per cent and plant protection 2.03 per cent indicating that, all the above input are cash input for which farmer required to pay immediately from his pocket. Cost 'B' contributes to 89.70 per cent. The share of family labour was 10.30 per cent. The per hectare yield obtained by overall adopter was 23.1 quintal with gross return of Rs.52849.50. The magnitude of total yield gap worked out to be 1000 kg/ha. This comprises of relatively higher magnitude of Yield Gap-II (714 kg/ha) than Yield Gap-I (286 kg/ha).

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