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Studies on contingent crop planning for *rabi* season

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Abstract

An experiment was conducted at the Research Farm of Hill Agricultural Research and Extension Centre, Dhaulakuan for the five consecutive years from 2000-01 to 2004-05 to find out suitable alternate crop planning with economically viable crops during *rabi* season. There were total twelve treatments comprising of various crops, sowing dates, varieties and crop sequences. The experiment was laid out in randomized block design with three replications. The grain yield of various crops was converted into wheat equivalent yield (q/ha) for the comparision of various treatments. Average data of five years shows that toria (sown on 25th of September)-wheat recorded the highest wheat equivalent yield (38.1 q/ha), this treatment was followed by toria (sown on 25th of September)-potato (35.6 q/ha). Under mid season conditions Toria + gobhi sarson (mid October sown) and timely sown gram gave satisfactory at par but significantly better wheat equivalent yield than wheat VL616 and HS 295. Under late season conditions i.e. last week of December sowing of lentil performed better than wheat and gave 23.1 q of wheat equivalent yield. When sowing was done on 3rd January, lentil and wheat performed at par and gave 11.6 and 10.9 q/ha of wheat equivalent yield, respectively.

Keywords: Contingent crop planning, *rabi*, wheat equivalent yield.

Introduction

Contingent crop planning is an important instrument for economic growth. It is intended to give a wider choice in the production of a variety of crops in an area so as to expand production related activities on various crops and also to minimize risk. Inclusion of certain crops in sequential and intercropping system has been found to reduce some weeds to a considerable extent, thereby reducing herbicide need to a great extent in areas where such weeds have assumed alarming proportion. In early, mid or late *rabi* season a number of options are available to a farmer, but which one is advisable will depend upon the economic viability of them. Therefore, an experiment was devised aimed to identify suitable alternate crop planning with economically viable crops during *rabi* season.

Material and Methods

The experiment was conducted at the Research Farm of Hill Agricultural Research and Extension Centre, Dhaulakuan for the five consecutive years from 2000-01 to 2004-05 during *rabi* season. The experiment was laid in randomized block design with three replications. There were total twelve treatments comprised of several options in terms of crops, varieties and cropping sequences : T_1 = Toria (25th September)-Wheat; T_2 = Toria (25th September)-Oat (fodder); T_3 = Toria (25th September)-Potato; T_4 = Toria + Gobhi Sarson; T_5 = Gobhi Sarson; T_6 = Wheat (VL 616); T_7 = Wheat (HS 295); T_8 = Gram (normal sown); T_9 = Wheat (HS 295) last week of December sowing; T_{10} = Wheat (HS 295) third of January sowing; T_{11} = Lentil (Vipsha) last week of December sown; T_{12} = Lentil (Vipsha) third of January sowing. The soil of the experimental site was sandy loam in texture with neutral pH, medium available nitrogen, high available phosphorus and low available potassium. The grain yield of various crops was converted to the wheat equivalent yield (q/ha) on the basis of prevailing market price of the produce to compare the various treatments.

Results and Discussions

Among various crop plannings for *rabi* season T_1 = toria (25th September)-wheat gave maximum returns in terms of wheat equivalent yield (38.1 q/ha), and this treatment was followed by T_3 = toria (25th September)-potato (35.6 q/ha) and T_2 = toria (25th September)-oat (fodder). It shows that taking a crop of toria before sowing of main *rabi* crop gives better return in terms of wheat equivalent yield. Sharma and Thakur (1995)

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Table 1. Studies on contingent crop planning for *rabi* season (average of 5 years)

Treatments	Grain yield (q/ha)	Wheat equivalent yield (q/ha)
T_1 = Toria (25th September)-Wheat	7.0-19.7	38.1
T_2 = Toria (25th September)-Oat(fodder)	6.7-136.3	33.9
T_3 = Toria (25th September)-Potato	6.7-81.5	35.6
T_4 = Toria + Gobhi sarson	4.2+6.1	27.4
T_5 = Gobhi sarson	10.1	26.7
T_6 = Wheat (VL 616)	24.0	24.0
T_7 = Wheat (HS 295)	21.7	21.7
T_8 = Gram (normal sown)	8.6	28.6
T_9 = Wheat (HS 295)last week of December sowing	17.1	17.1
T_{10} = Wheat (HS 295)third of January sowing	10.8	10.8
T_{11} = Lentil (Vipsha)last week of December sown	7.0	23.1
T_{12} = Lentil (Vipsha) third of January sowing	3.5	11.6
CD (P=0.05)	-	3.7

Table 2. Growth and yield attributes of various crops (average of five years)

Treatments	Tillers / m^2	Grains / spike	Test weight (g)	Siliquae / plant	Seeds / siliquae	Tuber yield / hill (g)	Pods / plant	Grain yield (q/ha)	Wheat equivalent yield (q/ha)
T_1 Toria var. DK 1 (25th September) – wheat (HS295)	250	47	3.2,40	159	12.3	-	-	7.0,19.7	38.1
T_2 Toria (25th September) - oat (fodder)	-	-	3.2	162	11.4	-	-	6.7,13 6.3	33.9
T_3 Toria (25th September) - potato var. KJ	-	-	3.2	160	11.8	212	-	6.7,81.5	35.6
T_4 Toria + gobhi sarson var. H.P.N-3 (Oct sowing)	-	-	3.1, 4.2	134, 222	10.2, 13.1	-	-	4.2+6.1	27.4
T_5 Gobhi sarson (Oct sowing)	-	-	4.3	252	13.6	-	-	10.1	26.7
T_6 Wheat var. VL 616 (mid Oct sowing)	311	51	42	-	-	-	-	24.0	24.0
T_7 Wheat var. HS 295 (timely sowing)	303	50	42	-	-	-	-	21.7	21.7
T_8 Gram (normal sown) var. C-235	-	-	130.1	-	-	34.2	-	8.6	28.6
T_9 Wheat (HS 295) last week of December sowing	248	45	37.3	-	-	-	-	17.1	17.1
T_{10} Wheat (HS 295) third week of January sowing	186	35	38.6	-	-	-	-	10.8	10.8
T_{11} Lentil (Vipsha) last week of December sowing	-	-	23.4	-	-	-	53	7.0	23.1
T_{12} Lentil (Vipsha) third week of January sowing	-	-	19.7	-	-	38	42	3.5	11.6
CD (P=0.05)								-	3.7

reported at par net returns from toria-wheat, toria-barley, toria-mustard, sarson + oat and sarson only under normal sowing time conditions. Among various treatments minimum wheat equivalent yield (10.8 q/ha) was recorded with the wheat (HS 295) sown on January third, it was followed by lentil (Vipsha) sown on third of January (11.6 q/ha). It shows that late sowing of wheat and lentil up to January is not economical. Intercropping of gobhi sarson with toria did not increase wheat equivalent yield significantly (27.4 q/ha) as compared to the pure cropping of gobhi Sarson (26.7 q/ha). Wheat equivalent yields were recorded at par under the treatment T_6 = wheat (VL 616) (24.0 q/ha) and T_7 = wheat (HS 295) (21.7 q/ha). Under normal sown conditions, cultivation of gram produced significantly higher wheat equivalent yield (28.6 q/ha) than timely sown wheat. When sowing of wheat and lentil is delayed up to last

week of December cultivation of lentil (Vipsha) is more profitable as it produced significantly higher wheat equivalent yield (23.1 q/ha) than cultivation of wheat (HS 295) (17.1 q/ha). However, when sowing of these crops is delayed up to third of January, it results in much reduction in the yields of these crops and gives at par wheat equivalent yield. Higher wheat yield (17.1 q/ha) under T_9 = wheat (HS 295) last week of December sowing than T_{10} = wheat (HS 295) third of January sowing (10.8 q/ha) is associated with higher number of tillers per m^2 (248), number of grains/ spike (45) and thousand seed weight (37.3 g). Sardana *et al.* (2003) also reported significant reduction in wheat yield under sowing on 5th of January than 15th of December. Tyagi *et al.* (2003) also reported significant reduction in yield and yield attributes when sowing of wheat was done on 21st December as compared to 20th November sowing. Mishra *et al.* (2000) and Singh and Dhaliwal (2000) and Randhawa *et al.* (1980) also reported similar type of findings. Significantly higher wheat equivalent yield (23.1 q/ha) with T_{11} = lentil (Vipsha) last week of December sown over T_{12} = lentil (Vipsha) third of January sowing (11.6 q/ha) has been associated with higher seed weight (23.4 g) and more number of pods/plant (53).

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