Access of Tecnological Inputs for Sustainable Cultivation in Drylands

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ABSTRACT

The productivity of dryland crops depend upon the availability of inputs with the farmers. Rapeseed-mustard, Gram and Bajra are the major crops of Rabi and Kharif season, respectively, in dryland farming zone of South –West of Haryana .The study highlighted that the inputs in rapeseed and mustard such as nitrogenous fertilizers, high yielding variety seeds and phosphatic fertilizers were available as per recommendation with 81.25, 75.00 and 62.20 per cent of farmers, respectively. The inputs, namely, knapsack sprayer, biofertilizer and bullock pair, seed cum fertilizer drill, camel, wheel hand-hoe for mechanical weeding and farm yard manure were not available with 93.75, 87.50, 81.25, 75 and 71.87, 53.12 per cent of farmers, respectively. None of the farmers had inputs like battery operated low volume sprayer and ridger seeder. In Gram, the inputs such as nitrogenous fertilizers men/ women labour (for spraying, harvesting and collection of bundles, threshing and winnowing) and phosphatic fertilizers were available as per recommendation with 76.27, 64.41 and 61.01 per cent of farmers, respectively. The inputs such as farm yard manure, high yielding variety seeds, nitrogenous and phosphate fertilizers, men/women labour were available with all the bajra growers. The inputs namely, ridger seeder, bullock pair, seed-cum-fertilizer drill, wheel hand-hoe and bio- fertilizers were not available with majority of farmers .The level of availability of inputs with a majority of rapeseed -mustard growers was medium (68 per cent). In gram, it was low with 80 per cent of farmers. The availability of inputs in cultivation of bajra was medium with 59 per cent of farmers .

Key words: *Dryland; Bio-fertilizer; Rapeseed-Mustard*

It is estimated that by 2020, the total domestic food grains demand will be about 294 million tonnes for the growing population.The total geographical area of our country is 329 million hectares, of which, net cultivated area is around 143 million hectares. In India, 70 percent of the farming (100.1 million hectares) is rainfed which accounts for 42 per cent of the foodgrains produced. Even with the full utilization of irrigation potential, agriculture could be practised in 70 million hectare (around 50 per cent of the net cultivated area) and, thus leaving 50 per cent of the net cultivated area under rainfed condition. The net cultivated area is stabilised during the previous years. There is very little scope of increasing it beyond 150 million hectares without adverse effect on the fragile eco-system. However, the cultivated area can be increased by using the rainfall which is a most important natural resource .Dryland farming plays an important role in agricultural production of the country. It is inevitable that the second green-revolution has to come from the dryland farming and accordingly the application of technology, inputs and investments has to be tailored to converts these so-called "grey areas into green" .Sustainable agriculture involves the integrated use of inputs and appropriate technologies. Inputs are important resources in order to make the farm productive. The productivity depends upon the availability and proper utilization of inputs and adoption of appropriate technology. Sustainability of dryland farming is the survival of the farmer practising dryland farming with long term profitability. It depends upon transfer and adoption of appropriate technologies and; the availability and utilization of required inputs, in order to maintain long term productivity. With this background, the study entitled "Sustainability of dryland farming in South-West Haryana" was planned with an objective to measure the extent of inputs availability with the farmers in cultivation of selected crops under dryland farming.

METHODOLOGY

The study was conducted in dryland farming zone of South-West Haryana. Considering the highest

percentage of dry farming area in net cultivated area, districts, i.e. Gurgaon, Mahendergarh and Bhiwani were selected for the study. One block each from the three selected districts was selected randomly. Further, from each block, two villages were selected randomly. Thus, six villages formed the sample of the study. From each village, 25 farmers who were practicing dryland farming were selected randomly. Thus, 150 farmers constituted the sample of the study. The recommended inputs required for the selected crops under dryland farming were identified separately based on the discussion with concerned scientists working in CCS HAU, Hisar and also from available package of practices for rabi and kharif crops of the university .In order to know the extent of availability of recommended inputs, the respondents were categorized into four groups viz. non-availability of inputs; input availability below recommendation; input availability as per recommendation and input availability more than recommended. A score of zero was assigned separately for non-availablity input; a score of one, for availability of input below recommendation; two, for availability of input as per recommendation and three, for availability of input more than recommendation for each of the input of selected crops.

Extent of availability of recommended inputs :

There were 14 recommended inputs for cultivation of Rapeseed and Mustard and the score ranged from 0 to 42. The minimum input availability score of an individual was 10 and maximum was 15 with mean of 10.69 and standard deviation of 1.34.

There were 14 inputs recommended for cultivation of Gram crop and the score ranged from 0 to 42. The minimum score of an individual for input availability was 7 and maximum was 10 with mean of 8.16 and standard deviation of 0.76.

There were 11 inputs recommended for cultivation of Bajra crop and the score varied from 0 to 33. The minimum score of an individual for availability of input was 8 and maximum was 11 with mean of 9.53 and standard deviation 0.75.

Considering the mean and standard deviation as a measure of check, the respondents were grouped into low, medium and high categories based on the level of input availability for selected crops under dryland farming.

Category	Input availability score		
	Rapeseed and Mustard	Gram	Bajra
Low (<X-SD)	<9.35	<7.40	<8.78
Medium (X-SD to X+SD)	9.35 to 12.03	7.40 to 8.92	8.78 to 10.27
High (>X+SD)	>12.03	>8.92	>10.28

Data were collected from the dryland farmers through personal interview method. The statistical tests used for analysis of data included frequency, percentage, mean and standard deviation.

RESULTS AND DISCUSSION

Availability of recommended inputs in cultivation of selected crops under dryland farming :

A. Availability of recommended inputs in cultivation of rapeseed-mustard :

The availability of recommend inputs in cultivation of rapeseed and mustard are presented in Table 1 The inputs such as nitrogenous fertilizers, high yielding variety seeds, men/women labour (for mechanical weeding, dusting, harvesting and threshing) and phosphatic fertilizers were available as per recommendation with 81.25, 75, 65.63 and 62.20 per cent of farmers, respectively. The inputs, namely, knapsack sprayer, biofertilizer and bullock pair, seed cum fertilizer drill, camel, wheel hand-hoe for mechanical weeding and farm yard manure were not available with 93.75, 87.50, 81.25, 75 and 71.87, 53.12 per cent of farmers, respectively. None of the farmers had inputs like battery operated low volume sprayer and ridger seeder.

B. Availability of recommended inputs in cultivation of gram :

The data in Table 2 indicate the availability of recommended inputs in cultivation of gram crop. The inputs such as nitrogenous fertilizers men/women labour (for spraying, harvesting and collection of bundles, threshing and winnowing) and phosphatic fertilizers were available as per recommendation with 76.27, 64.41 and 61.01 per cent of farmers, respectively. The inputs, namely, Bavistin, bullock-pair, seed-cum fertilizer drill, biofertilizers, insecticides/pesticides were not available with majority (97.13, 96, 90, 83 and 58 per cent) of gram growers ; respectively. The inputs such as ridger seeder, pheromonen traps and light traps were not available with any of the gram growers (Table 2).

Table 1. Extent of availability of recommended inputs in cultivation of Rapeseed and Mustard (N =32)

S.No.	Name of Inputs	Recommended input per acre	Extent of availability of inputs							
			Non availability of inputs		Input availability below recommendation		Input availability as per recommendation		Input availability more than recommendation	
			No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	Bullock pair*	1	28	87.50	0	00.00	4	12.50	0	00.00
2	Camel *	1	24	75.00	0	00.00	8	25.00	0	00.00
3	Seed-cum-fertilizer drill*	1	26	81.25	0	00.00	6	18.75	0	00.00
4	Ridger seeder*	1	32	100.00	0	00.00	0	00.00	0	00.00
5	Man/Women labour for mechanical weeding (6), dusting (1), harvesting (5) and threshing (2)	14	0	00.00	11	34.37	21	65.63	0	00.00
6	High yielding variety seeds	2kg	0	00.00	8	25.00	24	75.00	0	00.00
7	Farm yard manure	6 tonnes	17	53.12	10	31.25	5	15.62	0	00.00
8	Nitrogenous fertilizers	40kg	0	0.00	6	18.75	26	81.25	0	00.00
9	Phosphatic fertilizers	20 kg	12	37.50	0	0.00	20	62.20	0	00.00
10	Biofertilizer (Azotobactor)	250gm	28	87.50	0	0.00	4	12.50	0	00.00
11	Wheel hand hoe for mechanical weeding	1	23	71.87	0	0.00	9	28.13	0	00.00
12	Knapsack sprayer	1	30	93.75	0	0.00	2	6.25	0	00.00
13	Battery operted low volume sprayer	1	32	100.00	0	0.00	0	0.00	0	00.00
14	Insecticides/pesticides	400ml	18	56.25	6	0.00	8	25.00	0	00.00

* Input available for more than one acre

Table 2. Extent of availability of recommended inputs in cultivation of Gram (N =118)

S.No.	Name of Inputs	Recommended input per acre	Extent of availability of inputs							
			Non availability of inputs		Input availability below recommendation		Input availability as per recommendation		Input availability more than recommendation	
			No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1.	Bullock pair*	1	114	96.61	0	00.00	4	3.39	0	00.00
2.	Camel *	1	86	72.88	0	00.00	32	27.12	0	00.00
3.	Seed-cum-fertilizer drill*	1	107	90.68	0	00.00	11	9.32	0	00.00
4.	Ridger seeder*	1	118	100.00	0	00.00	0	00.00	0	00.00
5.	Man/Women labour for spraying (1), harvesting and collection of bundles (6), threshing and winnowing	9	0	00.00	42	35.59	76	64.41	0	00.00
6.	High yielding variety seeds	14-18 kg	60	50.85	32	27.12	26	22.03	0	00.00
7.	Bavistin for seed treatment for control of Wilt.	2.5g/kg seed	116	97.31	0	00.00	2	1.69	0	00.00
8.	Chlorpyriphose 25 EC for seed treatment for termite control		92	77.97	11	9.32	15	12.71	0	00.00
9.	Nitrogenous fertilizers	40kg	10	8.47	18	15.25	90	76.27	0	00.00
10.	Phosphatic fertilizers	20kg	21	17.80	25	21.19	72	61.01		00.00
11.	Biofertilizer (Azotobactor)	250gm	98	83.05	0	00.00	20	16.95	0	00.00
12.	Insecticides/pesticides for insect pest control. Integrated Pest Management	200ml-400ml	68	57.63	29	24.58	21	17.79	0	00.00
13	Pheramonetraps	5	118	100.00	0	00.00	0	00.00	00	00.00
14.	Light traps	5	118	100.00	0	00.00	0	00.00	0	00.00

* Input available for more than one acre

C. Availability of recommended inputs in cultivation of bajra : The data in Table 3 revealed the availability of inputs in cultivation of bajra. The inputs, namely, farm yard manure, high yielding variety seeds, nitrogenous fertilizers, men/women labour (for thinning and gap filling, mechanical weeding, harvesting, threshing and

winnowing, picking of ear-heads) and phosphatic fertilizers were available with 90, 71, 70, 59 and 53 per cent of farmers, respectively. The inputs such as ridger seeder, bullock-pair, seed-cum- fertilizer drill, wheel hand-hoe and biofertilizer were not available with 99,94,89,85 and 84 per cent of bajra growers, respectively.

Table 3. Extent of availability of recommended inputs in cultivation of Bajra (N =150)

S.No.	Name of Inputs	Recommended input per acre	Extent of availability of inputs							
			Non availability of inputs		Input availability below recommendation		Input availability as per recommendation		Input availability more than recommendation	
			No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
1	Bullock pair*	1	146	94.00	0	0.00	4	6.00	0	0.00
2	Camel*	1	115	76.67	0	0.00	35	23.33	0	0.00
3	seed-cum-fertilizer drill*	1	133	88.67	0	0.00	17	11.33	0	0.00
4	Ridger seeder*	1	148	98.67	0	0.00	2	1.33	0	0.00
5	Man/Women labour for thinning and gap filling (1), mechanical weeding (5), harvesting (8), threshing & winnowing (3), picking of earheads (4)	21	0	00.00	62	41.33	88	58.67	0	0.00
6	High yielding variety seeds	1.5-2.0kg	12	8.00	32	21.33	106	70.67	0	0.00
7	Nitrogenous fertilizers	40kg	17	11.33	28	18.67	105	70.00	0	0.00
8	Phosphatic fertilizers	20kg	16	10.67	51	34.00	83	55.33	0	0.00
9	Wheel hand hoe for weeding	1	128	85.33	0	0.00	22	14.67	0	0.00
10	Biofertilizer (Azotobactor)	250gm	126	84.00	0	0.00	24	16.00	0	0.00
11	Farm yard manure as mulching	1.6 tonnes	0	0.00	15	10.00	135	90.00	0	0.00

* Input available more than one acre

D. Level of availability of recommended inputs in cultivation of selected crops under dryland farming :

It is evident from the table 4 that the availability level of recommended inputs in cultivation of rapeseed and mustard was medium with 68 per cent of farmer followed by high (16 per cent) and low (15 per cent). In case of gram, 80 per cent of the farmers had low level of input availability, followed by medium and high level with percentage (18 and 3 per cent) of farmers. The availability of inputs in cultivation of bajra was medium with 59 per cent of farmers and remaining 37 per cent of farmers had low and 4 per cent of the farmers had high availability of inputs.

Table 4. Extent of level of availability of recommended inputs in cultivation of selected crops under dryland farming.

Availability level of inputs	Rapeseed and Mustard (N = 32)		Gram (N =118)		Bajra (N = 150)	
	No.	Per cent	No.	Per cent	No.	Per cent
Low	5	15.62	94	79.66	55	36.67
Medium	22	68.75	21	17.80	89	59.33
High	5	15.63	3	2.54	6	4.00
Total	32	100.00	118	100.00	150	100.00

The findings of the study by the Ray (1990), Kandiannam and Rangasamy (1994), Gautam and Pant (2001) and Jaggi et al. (2001) are in line with some of the observations of the study.

CONCLUSION

The cultivation of gram and bajra is less input oriented when compared to rapeseed and mustard, Further, the rapeseed and mustard crop is more prone for pest and disease attack and thus requires more of plant protection inputs to reduce the menace and to get recommended yield . The inputs such as men/women labour, high yielding variety seeds in rapeseed & mustared and bajra crops, nitrogenous and phosphatic fertilizers were available as per recommendation with all the dryland farming farmers. The dryland farming does not demand more labour as it is not labour intensive. The operations to be performed in dryland farming are very much limited. Hence, whatever the labour available with the farmers will be utilized for farming alone. In addition, the availability of high yielding variety seeds of rapeseed & mustard and bajra is also as per recommendation. The farmers are very much aware of importance of seed in farming. Further, the seed of high yielding varieties is available in nearby place at Seed Sale Centers of Haryana Seed Development Corporation. However, the high yielding variety seed of gram was not available with its growers. The reason might be non-

availability of improved seed of recommended varieties and also the farmers had not been provided information about the suitable recommended varieties. Though, the nitrogenous and phosphatic fertilizers are not readily available with the dryland farming farmers but they have capacity to purchase these inputs. The dryland farming farmers possessed one or two bullocks and camel for farming operations with very few dairy animals. The dung available from these animals is less and the farmers can not purchase the farm yard manure from outside because of its high cost.

The inputs such as ridger seeder, battery operated low volume sprayer, knapsack sprayer, wheel hand-hoe and seed-cum-fertilizer drill were not available with majority of the dryland farming farmers. The high cost of these inputs and lack of knowledge about ridger seeder, battery operated low volume sprayer and Knapsack sprayer might have limited the availability with the farmers.

The inputs such as Bavistin and Chlorphyriphos 25 EC for seed treatment, insecticides/pesticides, bio-fertilizers were not available with majority of dryland farming farmers. The high cost of inputs, adulteration in chemicals, lack of knowledge about the use and non availability of these inputs in the local market leads to the non availability of these inputs with the farmers.

The inputs such as pheromone and light traps for integrated pest management in gram were not available with any of gram growers. The researchers are recently advocating the use of these technologies in integrated pest management in gram under dryland farming. The farmers had not been well informed and trained about this particular technology.

REFERENCES

1. Gautam, Poonam and Pant, L.M. (2001). Biofertilziers and sustainable agriculture. *Indian Farmers' Digest.* **34** (5): 31-32.
2. Jaggi, R.C., Mahajan Anil, Chaudhary Anil and Baghla Kanika (2001). Integrated plant nutrient management (IPNM) in agriculture: The need of the day. *Indian Farmers' Digest.* **34** (1): 10-12.
3. Kandiannam, K. and Rangasamy, A. (1995). Effect of production technologies on the productivity of sorghum + cowpea intercropping system under rainfed. *Indian J. Agril. Res.* **29** (3): 157-163.
4. Ray, R.W. (1990). Defining and using the concept of sustainable agriculture. *J. Agronomy,* **19**: 126-130.