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Economics of Fodder Cultivation in Punjab and Haryana

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ABSTRACT

Background: Fodder cultivation has direct bearings on the production of milk by the dairy animals as it forms a major part of rearing cost incurred for milch animals. Several studies have pointed out the benefits of fodder cultivation, but the area under fodder cultivation is quite low; and its limited supply is hindering the milk productivity. Hence, the present study was undertaken to estimate the economics of fodder cultivation of *kharif* and *rabi* season in Punjab and Haryana as these two states have highest per capita milk availability in India.

Methods: Primary data on fodder cultivation was recorded for the year 2019-20. A sample of 100 respondents were interviewed from Punjab (Patiala, Bhatinda, Amritsar and Ludhiana districts) and 100 were selected from Haryana (Hisar, Karnal, Kaithal and Panipat districts). Simple arithmetic mean and percentages were used in the study.

Result: The output-input ratio for *kharif* and *rabi* fodder in Punjab and Haryana were found to be of 1.52 to 1.64 and 3.61 to 4.12. Since, majority of the farmers in these states follow crop and dairy farming system, due consideration should be provided to fodder cultivation as well.

Key words: Fodder, Milk.

INTRODUCTION

Fodder cultivation is undertaken to solely supplement the milch animals reared by the farmers. The productivity of milch breeds is heavily dependent upon the feed and fodder fed to them and in our country milk yield is in the lower end. Fodder deficiency in our country is to the tune of 36 per cent as it is grown in only 4.4 per cent of the total cultivable land (IGFRI, 2022). Nation-wide average deficit in green and dry fodder were also reported as 62.76 per cent and 23.46 per cent, respectively (Grover and Kumar, 2012). Several states have common property resources (CPR) for meeting the fodder requirements through grazing, but in Punjab and Haryana, animals are generally stall-fed due to disappearance of these grazing grounds (Sharma, 2017). Even for the states of Punjab and Haryana with highest milk availability of 1222 g/day and 1005 g/day, respectively, average milk yield was found to be of around 9-12 litres/ day for buffalo and crossbred cow while the indigenous cow yields no more than 6 litres/day (Kalra *et al*., 1995; Singh, 2012; Singh, 2018; Singh and Kaur, 2020; Statistical Abstract of Punjab, 2021; Statistical Abstract of Haryana, 2020-21). There is currently a net deficiency of 35.60 per cent green fodder, 10.95 per cent dry fodder and 44.00 per cent concentrate feed materials in the country (IGFRI, 2015). However, for the states of Punjab and Haryana, the status of fodder has been reported as surplus for green fodder and dry fodder by 133.05 per cent and 31.70 per cent, respectively (Roy *et al.*, 2019). Various studies have also concluded that feed and fodder form a major cost component for milk production (Aitawade *et al*., 2005; Mahajan and Chauhan, 2011; Khoveio *et al*., 2012; Bardhan *et al*., 2019; Singh and Kaur, 2020; Kaur *et al.*, 2022). Hence, the present study was undertaken to estimate the fodder availability in the states of Punjab and Haryana, since more than 85 per cent of the farms practiced crop and dairy farming system in the study area. Diversification of irrigated area paddy-wheat crop towards green fodder crops can also improve the output value and the efficiency of groundwater use in Punjab (Kumar *et al*., 2019). Currently, only a small portion of landholding *i.e*. 8 per cent of the total cultivatable land is dedicated towards the cultivation of fodder, therefore the farms were unable to fulfil the annual fodder demand of the milch animals and is met by the purchasing from market (Sharma, 2017). Apart from direct consumption of milk, the inhabitants of these two states also relish other dairy products like ghee, curd, sweets, lassi, *etc*.

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MATERIALS AND METHODS

Primary data from 200 farmers on cost and returns from fodder cultivation was collected using an interview schedule for 2019-20. The selected districts were Amritsar, Ludhiana, Bhatinda and Patiala from Punjab; and Karnal, Hisar, Kaithal and Hisar from Haryana. A sample of 100 dairy farmers from each state were selected and the data thus obtained through interview was tabulated. Simple arithmetic means and

Table 1: Cost of cultivation of fodder during *kharif* and *rabi* seasons in Punjab and Haryana. (`. per ha)

Cost components	Punjab		Haryana	
	Kharif fodder	*Rabi* fodder	*Kharif* fodder	*Rabi* fodder
Seeds	3667 (10.69)	4535 (12.59)	3659 (10.28)	4699 (11.78)
Fertilizers	3103 (9.05)	4946 (13.73)	3646 (10.24)	5116 (12.83)
Plant protection sprays	1868 (5.45)	959 (2.66)	1861 (5.23)	959 (2.41)
Human labour	17469 (50.94)	17181 (47.69)	17472 (49.09)	17186 (43.10)
Machine labour	5223 (15.23)	5198 (14.43)	5228 (14.69)	5193 (13.02)
Electricity charges	120 (0.35)	150 (0.42)	314 (0.88)	202 (0.51)
Interest on working capital @ 9 p.a. for half crop period	708 (2.06)	742 (2.06)	717 (2.01)	746 (1.87)
Total variable cost (A)	32157 (93.77)	33710 (93.77)	32896 (92.43)	34100 (85.52)
Depreciation and interest on capital investment (B)	2135 (6.23)	2316 (6.23)	2694 (7.57)	5773 (14.48)
Overall cost (C = A+B)	34292 (100.00)	36026 (100.00)	35590 (100.00)	39873 (100.00)
Output (q)	565.25	1025.50	560.63	1021.43
Gross returns (D)	90440	184590	89701	183857
Net returns (D-C)	56148	148564	54110	143983
Average area under cultivation (in ha)	0.30	0.14	0.16	0.08
Cost/unit of output (`./q)	60.67	35.13	63.48	39.04
Net returns/ unit of output (`./q)	99.33	144.87	96.52	140.96
B:C ratio	1.64	4.12	1.52	3.61

Note: Figures in parentheses indicate percentage.

percentages were used in the present study for calculation of cost and returns associated with fodder cultivation in Punjab Agricultural University, Ludhiana.

RESULTS AND DISCUSSION

Table 1 discusses the economics of the fodder production in both *kharif* and *rabi* seasons for the state of Punjab and Haryana. Fodder crops cultivated during *kharif* season were observed to be sorghum, bajra and maize while for *rabi* season berseem was cultivated extensively as it provides multiple cuttings, making it more suitable for feeding cattle. Wherein it was quite evident that human labour dominates the cost components by having a share of more than 40 per cent during both the seasons in Punjab as well as Haryana. It was observed that area under *kharif* fodder was almost double than the area under *rabi* fodder. Berseem (3.61 to 4.21) provides multiple cuttings, thus its output-input ratio was found to be twice the *kharif* fodder (1.52 to 1.64), indicating higher returns per unit of investment. The research findings were in resonance with the past studies of Grover and Kumar (2012) and Grover and Kumar (2013). The average herd size was found to be of 12.57 (Nos) for Punjab and 9.81 (Nos) for Haryana. As per the recommendations of DAHD, the average daily fodder requirement of an adult milch animal stands at 30 kgs of green fodder and 6 kgs of dry fodder; and the current fodder supply from the owned farm lands of Punjab (1590.75 q) and Haryana (1582.06 q) were able to meet the annual green fodder requirements of the milch animals. However, lower availability of dry fodder in the study area was forcing the farmers to buy it from market at higher prices. Hence, emphasis is being given on enhancing the productivity of cultivated fodder resources; fodder production through horti-pasture and silvi-pasture systems; fodder on non-competitive lands; alternative fodder resources like moringa and azolla, *etc;* crop residue quality enhancement; fodder conservation technologies like hay, bales, silage and feed blocks; custom hiring centres for machineries facilitating fodder production; fodder seed requirement and supply and contingent fodder planning and fodder conservation technologies (IGFRI, 2022).

CONCLUSION

The fodder cultivation despite proving to be profitable for the farmers is carried out in a very limited space and the owing to this reason, farm was able to meet round the year green fodder requirements but not the dry fodder requirements of dairy in Punjab and Haryana. Apart from low per cent of area under fodder crops, fodder availability faces many constraints like, lack of high yielding fodder varieties and quality seeds, increase in mechanical harvesting, changing crop pattern for cash crops, poor management of CPRs, low investment in fodder production, lack of post-harvest management, *etc*. It was also evident that fodder cultivation during *rabi* season was more beneficial than the *kharif* fodder, reason being that the former was providing multiple cuts with utilization of lesser resources for both the states. However, the overall B:C ratio of Punjab was observed to be better than that of the Haryana, therefore, larger area was devoted under the cultivation of fodder in Punjab in comparison to that of Haryana. Research and development in livestock sector in the study area will be highly impacted by the research and development of fodder crops as they go hand in hand. Efforts should be made towards increasing the area under fodder cultivation

which will in turn help in overcoming the fodder deficiency in these two states as well the whole country.

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Conflict of interest

All authors declare that they have no conflict of interest.

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