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Adoption level of green fodder production practices and constraints faced by the farmers of Rajasthan

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Abstract
Balanced feeding is essential to fully exploit the genetic potential of livestock.The green fodder availability for livestock in the arid region of Rajasthan is restricted to selected areas and seasons. The production and productivity of green fodder can be increased by ensuring adoption of production technology and by overcoming the constraints. The present study was conducted by interviewing 120 randomly selected green fodder crop cultivating farmers of Jodhpur district to know the adoption level and constraints experienced by them. Majority of the respondents either not adopted or partially adopted the improved cultivation practices of green fodder crops. Poor knowledge of green fodder cultivation technology, lack of awareness about importance of green fodder for animal health, inadequate irrigation facility or irregular supply of electricity for irrigation were the top three ranked constraints experienced by the respondents. The farmer participatory approach needs to be adopted by the extension agencies to disseminate green fodder production technologies for increasing the productivity of livestock resources of the study area.

Keywords: Adoption, Constraints, Green fodder technology, Rank based quotient

Introduction

Livestock have crucial role in food security and risk aversion mechanisms of the farm households (Sastry, 2000; Misra, 2006). Balanced feeding is essential to fully exploit the genetic potential of livestock. At the national level, there is a short supply of about 38 per cent green fodder especially during summer season (Kumar *et al*., 2013). Though livestock rearing is an important occupation of farmers in the arid region of Rajasthan, the fodder production is still deemed ancillary to agricultural production systems. The total area under fodder crops in Rajasthan was 2,87,977 ha during 2009-10 (Anonymous, 2011). Crop residues mainly of sorgh-um, pearl millet, maize, wheat and barley constitute the major source of fodder for livestock. Green fodder availability is restricted to selected areas and seasons in the state. With the increasing pressure on land for growing food and commercial crops and diversified use of agriculture residues, the gap between demand and supply of green fodder is increasing.

Jodhpur, one of the largest district of Rajasthan state is centrally situated in western arid region. It covers 11.6 per cent of total area of arid zone of the state. Farmers of the district depend on rainfed *kharif* crop cultivation and livestock rearing for livelihood. The total area under different fodder crops in the district was only 15,298 ha during 2009-10 (Anonymous, 2011). Pearl millet, sorghum, guar, maize and cowpea in *kharif* season and lucerne, fodder carrot and oat in *rabi* season where irrigation facility is available are major green fodder crops of the district. This district has huge potential of green fodder production due to favorable soil and agro-climatic condition but the productivity of green fodder crops is not up to desired level due to wide gap between the technology available at the research stations and its adoption at the farmers' field. In view of this the present study was undertaken to know the adoption level of farmers and constraints faced by them in improved green fodder production practices.

Materials and Methods

The study was conducted in Jodhpur district of Rajasthan during 2011-14. The district is situated between 25º51' to 27º37' N latitude and 71º48' to 73º52' E longitude. The six operational villages of Krishi Vigyan Kendra, Central Arid Zone Research Institute, Jodhpur namely; Lunawas, Purkhawas, Nevra Road, Lavera, Palri Ranawta and Asanda located in four different blocks (Luni, Ossian, Baori and Bhopalgarh) of the district were selected purposively for the study. From each selected village, 20 representative farmers cultivating improved green fodder

crops such as pearl millet (*Chari Bajra*), sorghum (*Chari Jowar*), lucerne, oat, *etc*. were selected randomly and hence the total sample was 120 farmers for the study. The data were collected using validated structured interview schedule. Different aspects of ten recommended practices considered as important by the specialists of the field were included in interview schedule to know their adoption level. The respondents were asked questions as per interview schedule about pattern of adoption of these 10 important recommended practices and response was recorded. The extent of adoption of each practice was worked out and expressed in frequencies and percentages. The farmers were asked to list out the important problems faced by them in adopting green fodder production practices in order of priority. Rank based quotient (RBQ) as suggested by Sabarathanam (1988) was worked out to identify the most important contants. This is as follows:

$$RBQ = \frac{\sum fi\,(n+1-i)}{N \times n} \times 100$$

Wherein, 'fi' is number of farmers reporting a particular problem under i^{th} rank; 'N' is number of farmers and 'n' is number of problems identified.

Results and Discussion

***Adoption level of improved green fodder production practices*:** The adoption level of different green fodder cultivation practices was presented in Table 1. The result indicated that 17.50 per cent of the respondents had completely adopted the soil and field preparation practice, 12.50 per cent farmers adopted fully the recommended time of sowing and recommended dose of fertilizer. The reason behind non adoption of recommended time of sowing might be absence of rainfall or lack of irrigation facility.

High yielding varieties suitable for the area and irrigation management practices were fully adopted by 11.6 per cent and 10.0 per cent respondents, respectively. Very few (9.1% and 6.6%) respondents adopted practices of weed management and seed treatment before sowing, respectively. Similarly only 5.8 per cent farmers have adopted the storage and conservation practices. Only 3.3 per cent farmers used plant protection measures for pest control. However, majority of the farmers either not adopted the improved package of recommended practices or adopted it partially. The non adoption or partial adoption of green fodder production practices might be due to lack of awareness among respondents and also lack of capacity building programmes on this aspect.

Poor knowledge about high yielding varieties, land preparation, use of bio-fertilizers and higher knowledge about critical stages of irrigation among berseem growers was reported by Satyapriya *et al*. (2013). The non-adoption of complex practices *viz*., rhizobium treatment, recommended dose of fertilizer and plant protection measures by majority of farmers in pulse crops was reported by Dolli e*t al*. (1995).

***Constraints*:** The production and productivity of green fodder for livestock was affected adversely by wide range of constraints. The constraints perceived by the farmers presented in Table 2 along with rank based quotient for each constraint and their respective ranks.

The poor knowledge of green fodder cultivation practices which includes scientific knowledge of various aspects of cultivation practices like field preparation, high yielding varieties, pest management *etc*. was identified as the major cause of low production of green fodder in the study area and was ranked first among different constraints (RBQ: 76.31). The reason behind the poor knowledge might be the lesser importance given by the extension functionaries to diffuse knowledge on improved

Table 1. Extent of adoption of improved green fodder crops cultivation practices

Improved Practices	Full adoption	Partial adoption	No adoption
High yielding varieties	14 (11.6)	28 (23.3)	78 (65.0)
Soil and field preparation	21 (17.5)	37 (30.8)	62 (51.6)
Seed treatment	08 (06.6)	25 (20.8)	87 (72.5)
Time of sowing	15 (12.5)	47 (39.1)	58 (48.3)
Seed rate and recommended spacing	06 (05.0)	22 (18.3)	92 (76.6)
Recommended dose of fertilizer application	15 (12.5)	39 (32.5)	66 (55.0)
Irrigation management	12 (10.0)	48 (40.0)	60 (50.0)
Weed management	11 (09.1)	35 (29.1)	74 (61.6)
Plant protection measures	04 (03.3)	13 (10.8)	103 (85.8)
Storage and conservation practices	07 (05.8)	19 (15.8)	94 (78.3)

Figures in the parenthesis are percentage of the total sample

fodder crops cultivation practices. The weakness of agricultural educational/training programmes offered to meet farmers' demand for specific knowledge about the fodder production and livestock feeding technologies was also reported by Litous *et al.* (2010).

Further lack of awareness about importance of green fodder for animal health was the second most important problem experienced by the farmers (RBQ: 72.15). The third important problem was inadequate irrigation facility or irregular supply of electricity for irrigation.The other constraints were high cost of inputs, supply of inferior quality inputs by the input dealers, non availability of seed of high yielding varieties, lack of institutional support for capacity building of the farmers, poor risk bearing ability of farmers and no regulated market of green fodder. The increased cultivation of improved forage cultivars after participation of farmers in exposure visit, farmer to farmer interaction and realizing the economic benefits of feeding green forage to animals was reported by Misra *et al.* (2007).

Conclusion

Majority of farmers either not adopted or partially adopted the recommended practices for cultivation of green fodder crops in Rajasthan. The production of green fodder was adversely affected mainly by poor knowledge of green fodder cultivation technology, lack of awareness about importance of green fodder for animal health, inadequate irrigation facility or irregular supply of electricity for irrigationand uncertainty of rainfall. Thus, more emphasis needs to be given on dissemination of green fodder production technologies by the extension agencies in farmer participatory mode to increase the productivity of livestock resources by improving the feed and fodder resources.

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Table 2. Constraints perceived by the farmer

Constraints	Rank											Overall
	I	II	III	IV	V	VI	VII	VIII	IX	X	RBQ	Rank
Poor knowledge of green fodder cultivation technology	34	21	17	11	16	6	7	4	3	1	76.31	I
Lack of awareness about importance of green fodder for animal health	30	19	16	08	15	08	06	10	05	03	72.15	II
Inadequate irrigation facility or Irregular supply of electricity for irrigation	21	17	19	22	16	09	06	05	03	02	71.15	III
Uncertainty of rainfall	28	22	13	09	14	10	05	07	08	04	69.56	IV
High cost of inputs	25	19	16	13	10	14	09	05	07	02	69.30	V
Supply of inferior quality inputs by the input dealers	08	25	16	11	15	13	09	06	10	07	63.14	VI
Non availability of seed of high yielding varieties	16	14	18	20	11	08	06	07	12	08	62.56	VII
Lack of institutional support for capacity building of the farmers	16	18	12	17	07	09	13	10	15	03	61.90	VIII
Poor risk bearing ability of farmers	05	09	14	23	20	16	12	06	07	03	55.72	IX
No regulated market of green fodder	18	15	21	16	11	14	08	06	05	06	50.90	X

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