Range Mgmt. & Agroforestry 34 (2) : 209-213, 2013
ISSN 0971-2070

Innovativeness and production practices of Lucerne among the dairy farmers of Maharashtra, India

Sanjay Kad[1], D. S. Brar[1], Rajiv Kale[2*], Vishal Vairagar[3]

[1] Division of Dairy Extension, National Dairy Research Institute, Karnal, Haryana. 132001, India.
[2]Zonal Project Directorate, Zone-VI, Jodhpur, Rajasthan, 342005.
[3]Krishi Vigyan Kendra, Jalgaon, Maharashtra -425508.
*Corresponding Author e-mail: rkrajivndri@gmail.com
Received: 10th April, 2013 Accepted: 2nd December, 2013

Abstract
The extent of innovativeness and existing production practices of fodder Lucerne (*Medicago sativa* L.) were assessed in the Pune district of Maharashtra, India by randomly selecting two tehsils (blocks) and two villages from each tehsil with the sample of 120 (40 marginal and small, 40 medium and 40 large) farmers. Eighty per cent respondents used Mould Board to plough followed by harrowing for land preparation. Majority of farmers (65.00 %) cultivated RL-88 variety of Lucerne. Around 60.83 % respondents used 5 to 6 kg seed rate per acre. Broadcast method for sowing the crop was followed by 87.50% respondents. More than three fourth (76.67 %) of the respondents took up sowing between month of October and November. Majority of the respondents (69.17 % and 75.83 %) did not apply herbicides and pesticides whereas, only 30.83% and 24.17 % farmers applied herbicides and pesticides, respectively. Around 4-5 tons of Farm Yard Manure per acre was applied by 59.17% respondents. Regarding fertilizer, 54.17 per cent of respondents applied 40 kg N, 15-20 kg P and 15-20 of K per acre. In case of irrigations, 73.33 per cent respondents resorted to 10 to 12 irrigations. Most of the respondents (77.50%) harvested crop at 50 to 55 days. Little over two third (69.17 %) of the respondents were found to have medium level of innovativeness. Family education status and extension contact were found to have positive and significant relation with innovativeness of respondents. So, it is important to increase the extent of extension contact of respondents to improve the innovativeness and production practices of Lucerne crop.

Keywords: Adoption, Correlation, Extension, Fodder, Maharashtra, Rahuri Lucerne-88, Socio economic traits

Introduction

Livestock rearing is one of the major occupations in India and making significant contribution to the country's GDP. Livestock is considered one of the integral parts of livelihood in rural India. The livestock sector provides a significant proportion of self-employment opportunities and supplements the income of most sections of India's agrarian society. Livestock have been contributing about 15-20% to the household income of farmers, which has been steadily increasing during recent years (Hegde, 2010). However, the productivity of dairy animals is greatly constrained by the scarcity of green fodder and good quality feed (Misra *et al*., 2005, Shah *et al.,* 2011).

Lucerne (*Medicago sativa* L.) is one of the important fodder crops grown in India and contains 15% of crude protein and 72% dry matter. It is primarily concentrated to the states of Maharashtra, Gujarat, Haryana, Punjab, Madhya Pradesh and Uttar Pradesh in India. Though the animal husbandry sector has a good growth potential, but further growth of the sector depends on availability of quality fodder and improvement in livestock breeds. Promotion of high yielding varieties and production technologies among farmers could be a great help in solving problems related to fodder management for livestock. It was, therefore, necessary to investigate production practices of fodder Lucerne as well as innovativeness for adoption of new variety among the dairy farmers.

Materials and Methods

The present study was conducted in purposively selected Pune district of Maharashtra. A multistage random sampling technique was applied for the selection of district, tehsils, villages and dairy farmers. There are 14 tehsils in Pune district, having almost same demographic feature, culture system and agriculture situation. Two tehsils namely, Junnar and Ambegaon were selected randomly from Pune District for the investigation. Two villages were selected randomly from each tehsil, *viz*., Hiware and Ozar

villages from Junnar tehsil and Nirgudsar and Jawale villages from Ambegaon tehsil. To select the respondents, list of dairy farmers growing at least two fodder crops in a year and having at least one milch animal was prepared separately for four villages. From the list of each village, 30 respondents comprising 10 dairy farmers from each category, *i.e*., marginal and small, medium and large according to their land holding were selected randomly. There were 40 farmers from each category, thus, a total number of 120 farmers constituted the sample for the present study. Data were collected by personnel interview method with the help of a pre-tested structured interview schedule constructed for the purpose.

To study the existing production practices of Lucerne, initially a list of major cultivation practices presently followed by farmers was prepared *viz*., land preparation, variety, seed rate, sowing time, sowing method, manures and fertilizers, number of irrigations, method of weed control, plant protection and harvesting. Innovativeness is the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system (Rogers, 1983). To study the innovativeness of dairy farmers a schedule was developed and innovativeness of the respondents was worked out with the help of the following formula developed for study:

I = Pm - Pd

Where,

I = Innovativeness (score) of the dairy farmers

Pm = Maximum number of years prior to which an innovation was introduced in the locality

Pd = Yado ï Yaw

Yado = Actual chronological year of adoption of an innovation

Yaw = Actual chronological year of awareness of an innovation

Pd = Period of difference between adoption and awareness of innovation

The scores of innovativeness obtained by the respondent were categorized as:

a) Low level of innovativeness = Less than Mean ï SD

b) Medium level of innovativeness = Between Mean ï SD and Mean + SD

c) High level of innovativeness = Above Mean + SD

The relationship between socio-economic traits and innovativeness of dairy farmers was determined with correlation coefficient.

Results and Discussion

Socio-economic traits of the respondent

Important socio economic traits of the respondents are given in Table 1. Majority of the dairy farmers (75.83%) had medium level of family education status, whereas 7.50 % had low and 16.67 % had high level of family education status. Half of the respondents (51.67 %) maintained small (less than 8) herd size, 27.50% and 18.33% had medium (8 to 15 animals) and large (16 to 26 animals) herd size, respectively. However, it indicated that only 2.50 per cent farmer respondents had very large herd size (more than 26 animals). Several reasons like non availability of space to house more number of animals, high cost of animals, restricting herd size in accordance to fodder availability, selling of animals to meet out contingency expenditure of the family etc., would have influenced the present finding. Around 63.33 % of respondents had medium level of extension contact, followed by 25.00 per cent with low level of extension contact. Only 11.67 per cent of respondents had high level of extension contact.

Table 1: Socio economic characteristics of the respondents

Variables	Category	Respondents (n=120)	
		Frequency	Percentage
Family education status	Low (<97.35)	9	7.50
	Medium (97.35 to 157.12)	91	75.83
	High (> 157.12)	20	16.67
Herd size (numbers)	Small (< 8)	62	51.67
	Medium (8 to 15)	33	27.50
	Large (16 To 26)	22	18.33
	Very large (> 26)	3	2.50
Extension contact	Low (< 1.20)	30	25.00
	Medium (1 To 4)	76	63.33
	High (> 4.22)	14	11.67

Production practices of Lucerne followed by the dairy farmers

The farmers of the study area were growing Lucerne as fodder crop in the Rabi season. Major production practices of Lucerne followed by the respondents are presented in Table 2. Eighty per cent respondents used Mould Board to plough followed by harrowing for land preparation, whereas 19.17 per cent farmers practiced 2-3 harrowings without any ploughing. Similarly, 65.00% dairy respondents used RL- 88 variety and 22.50% respondents used Puna-B variety for cultivation; whereas 12.50% respondents were not particular about the type of variety. Further 60.83% respondents used 5 to 6 kg and 39.17% used more than 6 kg seed rate per acre. More than three fourth (76.67%) of the respondents took up sowing between October - November and the remaining (23.33%) in between December - January. Broadcast method of sowing was followed by 87.50% respondents and only 12.50% respondents practiced line sowing by seed drill. Hence, line sowing method needs to be popularized among

farmers for better yield and lower the cultivation cost. Around 4 to 5 tons of Farm Yard Manure per acre was applied by 59.17% respondents and 54.17 per cent of respondents applied 40 kg N, 15-20 kg P and 15-20 of K per acre. In case of irrigations, 73.33 per cent respondents resorted to 10 to 12 irrigations and 26.67 per cent respondents followed more than 12 irrigations. Majority of the respondents (69.17% and 75.83%) did not practice chemical methods for weed and pest control, respectively. Only 30.83% applied Alochlor as herbicide for weed control. Likewise only 24.17 % respondents had applied Endosulfan for pest control. More than three fourth of the respondents (77.50%) harvested crop at 50 to 55 days and 19.17% respondents harvested at later stages (above 55 days).

Extent of innovativeness of dairy farmers

An attempt was made to determine the innovativeness of the dairy farmers in relation to RL- 88 variety of Lucerne.It could be visualized from Table 3 that majority (69.17%) of the respondents belonged to medium level of innovativeness followed by 23.33 and 7.50 per cent respondents belonging to high and low level of innovativeness, respectively. Similarly, Chaudhari (2006) and Suresh (2004) had reported medium level of innovativeness among the dairy farmers. The possible reason for the above findings could be the medium level of educational status as well as extension contact. Educated farmers with good extension contacts can easily be exposed to the innovations and they can take decision on adoption. Hall *et al*. (2008) reported that while fodder technology is important, it is not enough. It is necessary to frame the question of fodder shortage not from the perspective of technological scarcity, but from the perspective of capacity scarcity in relation to fodder innovation.

Table 2: Production practices of Lucerne followed by dairy farmers

Production practices followed	Respondents (n=120)	
	Frequency	Percentage
Land preparation		
Ploughing by M.B. plough followed by harrowing	97	80.83
2-3 harrowings	23	19.17
Varieties used		
RL- 88	78	65.00
Puna- B	27	22.50
Both RL-88 and Puna- B	15	12.50
Seed rate (kg/acre)		
5 to 6	73	60.83
More than 6	47	39.17
Sowing time		
October - November	92	76.67
December - January	28	23.33
Method of sowing		
Seed drill	15	12.50
Broadcasting	105	87.50
Manures and fertilizers		
FYM (2 to 3 tons/ acre)	71	59.17
NPK dose (5-6: 40-45:15-20 kg/ acre)	65	54.17
Irrigations		
10 to 12 times	88	73.33
More than 12 times	32	26.67
Weed control methods		
Chemical application- Alochlor etc.	37	30.83
Non application of chemicals	83	69.17
Pest control		
By using chemical- Endosulphan etc.	29	24.17
Not using any pest control method	91	75.83
Harvesting time		
50 to 55 days after sowing	93	77.50
More than 55 days after sowing	27	22.50

1 Acre = 4000 sq m

Innovativeness among different categories of dairy farmers

It is evident from the Table 4 that 80% marginal and small, 35% medium and 65% large farmers belonged to medium level of innovativeness. Ravikumar (2007) also indicated that majority of dairy farmers from small, medium and large categories had medium level of innovativeness. Low level of education and extension contact might be the factors contributing the medium level of innovativeness among the respondent.

Table 3: Extent of innovativeness of dairy farmers

Category	Respondents (120)	
	Frequency	Percentage
Low (<11.02)	09	7.50
Medium (11.02 to 12.70)	83	69.17
High (> 12.70)	28	23.33

Mean: 11.86 SD: 0.84

Table 4: Distribution of different categories of dairy farmers according to their innovativeness score

Dairy farmers category	Level of Innovativeness	Innovativeness RL-88 (Lucerne)	
		Frequency	Percentage
Marginal and small farmers (n=40)	Low	2	5.00
	Medium	32	80.00
	High	6	15.00
Medium farmers (n=40)	Low	12	30.00
	Medium	14	35.00
	High	14	35.00
Large farmers (n=40)	Low	8	20.00
	Medium	26	65.00
	High	6	15.00

Relationship between socio-economic traits and innovativeness

The correlation between family education status of respondents and innovativeness was found positive and significant at 1% level of probability which indicated that the dairy farmers with high family education status had high level of innovativeness (Table 5). This might be due to the reason that, irrespective of individual respondentsõ education, better fodder management could be affected by family education status, as it is a joint activity carried out by all the members of the family. The similar finding was reported by Aulakh *et al*. (2011). Extension contact of respondents had positive and significant relationship with innovativeness at 5 % level of probability. This can be through the extension agent visits to the farmers or the farmer visits to the extension office seeking information and advice. Agricultural extension is considered a type of informal adult education that is intended to enhance farmersôknowledge in certain areas and enables them to benefit from available technologies and improved practices. In this way, the extension service supplements the deficiency in the farmersôformal education. Thus, the significant positive effect of both education status of family and extension contact is consistent logical, expected and in line with previous literature (Ajayi et al., 2007; Kuntashula, et al., 2004; Mekuria and Waddington, 2004; Muneer, 2008). However, the remaining traits viz., land holding and herd size had non- significant relationship with innovativeness.

Table 5: Correlation between selected socio-economic traits and innovativeness

Independent variables	Correlation coefficient (r)
Family education status	0.087**
Land holding	0.151
Herd size	0.068
Extension contact	0.320 *

***** Significant at 5 %; ****** Significant at 1%.

Conclusion

The results of the study revealed that majority of farmers used RL-88 variety of the cultivation of Lucerne. But the innovativeness of the farmers was found at the medium level. Family education status and extension contact were found to have positive and significant relation with innovativeness of respondents. So, it is important to increase the extent of extension contact of respondents to improve the innovativeness and accordingly appropriate interventions and policies need to be determined.

References

Ajayi, O. C., F. K. Akinnifesi, G. Sileshi and S. Chakeredza. 2007. Adoption of renewable soil fertility replenishment technologies in the southern African region: Lessons learnt and the way forward. *Natural Resources Forum* 31: 306 ï 317.

Aulakh, G. S., S. Singh and J. S. Yadav. 2011. A study of recommended feeding practices by the buffalo owners of Punjab. *Indian Journal of Animal Sciences* 81: 631-633.

Chaudhari, R. R. 2006. *A study on entrepreneurial behaviour of dairy farmers*. *Ph.D Thesis*, University of Agricultural Sciences, Dharwad.

Hall, A., R. V. Sulaiman, M. Dhamankar, P. Bezkorowajnyj and L. Prasad. 2008. *Reframing technical change: Livestock Fodder Scarcity Revisited as Innovation Capacity Scarcity*. *UNU-MERIT Working Papers*. United Nations University. The Netherlands.

Hegde, N. G. 2010. *Forage resource development in India*. In: Souvenir of IGFRI Foundation Day, November 2010, Jhansi.

Mekuria, M. and S. Waddington. 2004. Institutional and policy support is essential to promote the adoption of soil fertility technologies on maize-based smallholder farms in Southern Africa. *The 4th International Crop Science Congress.* (26 Sept. -1 Oct. 2004.) Brisbane, Australia.

Misra, A. K., V. Maruthi, K. V. Subrhmanyam, M. V. S. Babu, T. Y. Reddy, B. Shivarudrappa and Y. S. Ramakrishna. 2005. Impact of adoption of improved forage production on livelihood of farmers in semi-arid India. *Souvenir-cum-Abstracts of National Symposium on Augmenting forage resources in arid and semiarid region: Long term strategies*. Organized by RMSI and IGFRI, Jhansi, India. pp. 48ï 50.

Muneer S. 2008. Factors affecting adoption of agroforestry farming system as a mean for sustainable agricultural development and environment conservation in arid areas of Northern Kordofan State, Sudan. *Saudi Journal of Biological Sciences* 15: 137-145.

Ravikumar, S., K. V. R. Reddy and B. Sudhakar Rao. 2007. Farmersô choice for cost recovery of veterinary services in different livestock holding systems- A case study of India. *Livestock Research for Rural Development.* 19 (5): Article 66. Retrieved December 6, 2013, from http://www.lrrd.org/lrrd19/5/kuma19066.htm

Rogers, E. M. 1983. *Diffusion of Innovations*, New York: Free Press.

Shah, V. D., M. Makwana, S. Sharma. 2011. *Economics of production, processing and marketing of fodder crops in Gujarat.* Agro-Economic Research Centre, Sardar Patel University,Gujarat, Research Study No.144.

Suresh. 2004. Entrepreneurial behaviour of milk producers in Chittoor district of Andhra Pradesh ï A critical study. *M. V. Sc. Thesis,* Acharya N. G. Ranga Agricultural University, Hyderabad.