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RESEARCH ARTICLE

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Evaluation of forage demonstrations to identify adoption gaps in oats production in limited water situations under RKVY project

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ABSTRACT : A study conducted in North West region of Rajasthan among 66 farmers sampled from four districts namely, Bikaner, Sriganganagar, Sikar and Hanumangarh. Among the districts 22 villages were selected randomly and all respondents were possessing limited irrigation resources. Improved package of practices for oats cultivation were maintained regarding forage demonstrations. The study was conducted for three years (*i.e.* 2011-12 to 2013-14) during *Rabi* season under RKVY project, governed by SKRAU, Bikaner and funded by Department of Agriculture and Farmer Welfare, GOI through Govt. of Rajasthan, Jaipur. Findings of the study revealed that increase in yield in demonstration plots due to adoption of improved package of practices was ranged between 31.6 to 55.56 per cent with mean per cent increase of 44.31% as compared to traditional practices of oats cultivation. In case of technology gap 154.50 q/ha overall mean difference was observed whereas 75.00 q/ha yield an average extension gap and a wide technology gap of 42.0 per cent was recorded as a result of difference between technology generated by the researchers and its adoption at the farmers fields. However, the overall adoption index increased from 7.00 to 46.70 per cent due to intervention of the project. Study further highlighted that the comparison of cost: benefit ratio between traditional practice and the adoption of improved practices indicated that demonstrations technology proved twice profitable as compared to existing traditional practices. While an overall increase adoption index noted were 3.5 to 49.8, 4.6 to 34.6, 12.9 to 49.81, 8.85 to 63.9, 4.9 to 34.2 and 7.3 to 48.4 per cent for the improved varieties, seed treatment, fertilizer and irrigation management, weed control and plant protection measures and cutting management practices, respectively.

KEY WORDS : Adoption index, Extension gap, Forage oats production, Potential yield, Technology gap, Water limited condition

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INTRODUCTION

During post Green Revolution development and extension of production and protection technologies in forages the contribution to livestock food basket in

general and green fodder availability in particular, there is a wide gap between demand and supply both at national level and regional across in the country. At present, India faces a net deficit of 35.6% green fodder, 10.95% dry crop residues and 44% concentrate feed ingredients and the demand for green and dry fodder will reach to 1012 and 631 million tonnes by the year 2050 (IGFRI Vision: 2050, Kumar *et al.*, 2016). Further, there are also seasonal and regional imbalances in the fodder production in the country. Only way to meet the fod- der needs of livestock may be possible by increased productivity per unit land area and also through integration of fodder crops in the existing farming systems. Moreover leaving low endowed lands with more risk situations under green forages cultivation, non-availability of quality seeds of promising cultivars, low level of fertigation and susceptibility to pests and diseases have been the major constraints for limiting forage production in general and oats in particularly. The improved production, protection and management factors have the potential to increase the production to a great extent. The inception of Rashtriya Krishi Vikas Yojana has brought out significant improvement in this regard by demonstrating the production potential of forage oats against the farming practices. Oats (*Avena sativa* L.) is the most important winter cereal fodder and rich source of energy, protein, vitamin B_1, phosphorus, iron and other minerals. It is mainly grown under the situation where, water supply is limited and farmer cannot grow legumes like berseem and lucerne. It has excellent growth habit, quick recovery after cutting and provides good quality herbage. In India, it is used as green fodder, hay and silage for animals. Keeping in view the significance of transfer of technology, the present investigation was undertaken in North-West region of Rajasthan to find out the yields gap between improved crop management of forage oats production under limited water situations through demonstrations at farmer's fields.

EXPERIMENTAL METHODS

To evaluate the performance, effectiveness and adoption of improved forage crop production technologies in comparison to traditional farmer's practices, a total of 66 forage demonstrations were conducted in three zones (Ia, Ib and IIa) of North-West Rajasthan. Total 22 villages selected in four districts *viz.*, Bikaner, Sriganganagar, Sikar and Hanumangarh under RKVY study on "Optimization of green forage production and ensuring its Availability throughout the year under limited availability of irrigation water in North-West Rajasthan". Forage yield data from the improved technology demonstration plots as well as farmers practice plots were recorded by taking samples from three different sites at each location. Further, to compute the technology gap, extension gap and technology index and adoption index the following formula has been used.

Technology gap = Potential yield – Improved practices yield

Extension gap = Demonstration yield (IP) – Farmers yield

Technology index = $\{(P_1 - D_1)P_1\} \times 100$

where,

P_1 = Potential yield of the ith crop

D_1 = Demonstration yield of the ith crop

Adoption index = (Ai/Ri) x 100

where, Ai = Adoption score obtained by the farmers for the ith crop

Ri = Possible maximum score of the ith crop (list of recommended practices each one was assigned a score of 1)

This procedure was followed for six major production technologies of oats for the study purpose. The technologies are: improved varieties, seed treatment, fertilizer management, irrigation management, weeds and plant protection measure and cutting management were calculated in the responses of respondents regarding adoption of forage production technology for oat. The collected data were tabulated and analysed with the help of frequency, per cent and mean basis and interpreted accordingly.

EXPERIMENTAL RESULTS AND ANALYSIS

The results obtained were quite satisfactory with a positive trend. Adoption of improved technology has significant impact on seed yield *vis-à-vis* yield gaps in oat cultivation under limited irrigation conditions (Table 1). Increase in yield in demonstration plots due to adoption of improved package of practices ranged between 31.60 to 55.50 per cent with a mean per cent increase of 44.31 per cent as compared to traditional farming practices prevailing in the particular study village. This indicates that held demonstrations are quite successful in bridging

up the yield gaps between improved and farmers practices (Rana *et al.*, 2002). Technology gap with an overall mean difference of 154.50 q/ha in yield was noticed under study. The climatic, edaphic, socio-economic situations and management practices might be the factors responsible for the gap between potential and demonstrations plots yield. This gap can be narrowed down only by the location specific technology based recommendations (Kadian *et al.*, 1997).

There was an average extension gap of 75 q/ha in yield which indicates that farmers have a lot of scope to raise their yields. This can be bridge up strengthening of extension agencies which can upgrade the farmers knowledge and awareness through time to time organization of training camps, field days, group discussion and distribution of agriculture problem oriented literatures etc. This will help in effective extension of recommended technology to increase the overall productivity of oat and simultaneously the economic conditions of the farming community. These results are in conformation with those of Gupta and Sharma (2005) and Sheoran *et al.* (2009).

On an average, a wide technology index of 38.63 per cent was recorded as result of difference between technology generated by the researchers and its implementation of the farmers field indicating poor dissemination and adoption of technology. Poor extension network and lack of location specific recommendations can be probable causes of lower adoption of technology generated. The comparison of cost benefit ratio between improved and farmers practices indicates that the adoption of improved practices were more profitable as compared to farmers practice. Zone-wise (village-wise) adoption index percentage indicated an increase from 6.5 to 42.96 per cent in Bikaner district, 7.1 to 46.27 per cent in Sriganganagar district, 7.3 to 49.72 per cent in Sikar district and 7.1 to 47.80 per cent in Hanumangarh district. However, the overall adoption index increased from 7.0 to 46.7 per cent due to the technological intervention of the project. Variation within the districts/villages in relation to technology and extension gaps and adoption index of crop management technology components may be attributed due to differences in the knowledge and awareness levels, inherent resource based and risk bearing capacity of the farmers. Input wise production technology components when compared elucidated that an overall increase of 3.5 to 49.8, 4.6 to 34.6, 12.9 to 49.8, 8.85 to 63.9, 4.9 to 34.2 and 7.3 to 48.4 per cent adoption index for improved variety, seed treatment,

Table 1 : Yield gaps and economics of oat green forage in different zone under limited water situations (*Rabi* season of 2011-12 to 2013-14)

RKVY Zone (Villages)	No. of demonstrations	Average forage yield (q/ha)			% increase in yield	Technology gap (q/ha)	Extension gap (q/ha)	Technology index %	Adoption index		Cost: benefit ratio	
		PY	IP	FP					Initial	Final	IP	FP
1	2	3	4	5	6	7	8	9	10	11	12	13
Bikaner	29	400.0	232.0	152.0	52.64	168.0	80.0	42.0	6.5	42.96	1.93	1.32
Srigangangar	13	400.0	220.0	160.0	37.50	180.0	60.0	45.0	7.1	46.27	1.37	1.02
Fatehpur Shekhawati	10	400.0	280.0	180.0	55.50	120.0	100.0	30.0	7.3	49.72	1.30	0.70
Sangaria, Hanumangarh	14	400.0	250.0	190.0	31.60	150.0	60.0	37.80	7.1	47.80	1.50	1.07
Mean	66	400.0	245.50	170.50	44.31	154.50	75.0	38.63	7.0	46.7	1.57	1.02

PY= Potential yield, IP = Improved practices, FP= Farmers practice.

Table 2 : Adoption index for different technology components in green forage demonstration of oat (cv. KENT) (*Rabi*, 2011-12 to 2013-14)

Components	Zone Ic, Bikaner		Zone-Ib SriGanganagar		Zone IIa Sikar (Fatehpur shekhawati)		Zone Ib Hanumangarh		Over all impact			Rank
	BTI	ATI	BTI	ATI	BTI	ATI	BTI	ATI	BTI	ATI	Diff	
Improved varieties	3.2	45.6	3.4	48.2	3.8	50.4	3.6	55.2	3.3	49.8	46.3	II
Seed treatment	4.5	32.6	4.9	33.9	4.9	38.9	4.2	33.1	4.6	34.6	30.00	V
Fertilizer management	12.6	50.2	13.1	51.1	13.4	52.3	12.8	45.6	12.9	49.8	36.9	IV
Irrigation management	8.3	60.1	9.4	63.2	9.1	70.2	8.6	62.2	8.85	63.9	55.0	I
Weeds and P.P measures	4.6	29.9	4.9	33.4	5.2	39.3	5.0	35.3	4.9	34.2	29.3	VI
Cutting management	6.1	39.4	7.2	47.8	7.4	51.2	8.7	55.4	7.3	48.4	41.1	III
Adoption index	6.56	42.96	7.15	46.27	7.3	49.72	7.15	47.80	7.0	46.7	39.7	

B1 = Before technological intervention A1 = After technological intervention

fertilizer management, irrigation management, weeds and plant protection measures and cutting management, respectively. Among the critical resources irrigation ranked first followed by critical inputs improved seed varieties, cutting management fertilizer management, seed treatment and weeds and plant protection measures (Table 2). Similar findings were also reported by Siag *et al.* (2000) and Sheoran *et al.* (2009).

Conclusion :

From the above foregoing explanation, it can be concluded that adoption of improved technology has significant impact on seed yield *vis-a vis* yield gaps in oat cultivation for forage production under limited water conditions. Increase in yield in demonstration plots due to adoption of improved package of practices ranged between 31.60 to 55.50 per cent with mean per cent increase of 44.31 per cent as compared to traditional farming practices prevailing in particular district. Technological gap with an overall mean difference of 154.50 q/ha in yield was noticed under study.

There was an average extension gap of 75.0 q/ha in yield and an average, a wide technology index of 42.0 per cent was recorded as a result of difference between technology generated by the researchers and its implementation of the farmer's fields indicating poor dissemination and adoption of technology. However, the overall adoption index increased from 7.0 to 46.7 per cent due to invention of the project. Further, it was concluded that resources and input wise production technology components when compared elucidated that an overall increase of 3.5 to 49.8, 4.6 to 34.6, 12.9 to 49.8, 8.85 to 63.9, 4.9 to 34.2 and 7.3 to 48.4 per cent in adoption index for improved varieties, seed treatment, fertilizer management, irrigation management, weeds and plant protectionp measures and cutting management, respectively.

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REFERENCES

Chahal, Devender, Ahmed, Afzal and Bhatia, J.N. (2012). Assessment of Agro forestry based two-tier cropping system in Ambal district of Haryana. *Agric. Update*, **7** (3&4) : 210-213.

Gupta, N.K. and Sharma, A.K.(2005). Impact of frontline demonstration on *Gobi Sarason* and its adoption in Jammu district of J&K state. *Environ & Ecol.*, **23** (Spl.1), 198-199.

Kadian, K.S., Sharma, R. and Sharma, A.K. (1997). Evaluation of frontline demonstration on oilseeds in Kangra valley of H.P. *Annals Agril. Res.*, **19** (1) : 40-43.

Kumar, S., Palsaniya, D.R., Coudhary and Kantwa, S.R. (2016). Intraining programme on forage resourc management for sustainable and economic livestock production data source IGFRI,vision 2050 from Nov.29 to Dec.8,2016 orgnize at DHRD, SKRAU,Bikaner Rajasthan, India.

Parmar, A. Manu, Ajrawat, Berjesh and Jamwal, Mahital (2013). Impact of front line demonstration of oilseed crops in transfer of improved technology in India. *Agric. Update*, **8** (1 & 2) : 174-176.

Rana, V.S., Malik, A.C. and Midha, L.K. (2002). Evaluating gaps in transfer of dryland technology in mustard frontline demonstrations in Haryana. *Haryana J. Agron.*, **18** (122): 1148-1149.

Sharma B.L. and Sharma, R.L. (2013). Impact recommended technology in cowpea cultivation in sikar district Zone II A of of Rajasthan India. *J. Extn. Edu. & Rural Development*, **21** : 34-38.

Sheoran, Parvender, Singh, Sukhvinder, Bhushan, Bharat and Bawa, S.S. (2009). Impact assessment of chickpea frontline demonstrations. *Indian J. Extn. Edu.*, **45** (1&2) : 115-117.

Siag, R.K., Gau, R.H., Verma, R.S and Yadav, D.K. (2000). Evaluation of frontline demonstration to identify adoption gaps in chickpea production under irrigated conditions of Sriganganagar district. *Indian J. Pulses Res.*, **13**(i):28-30.

Singh, P., Lakhera, J.P. and Chandra, S. (2012). Knowledge and adoption of mothbean production technology in western Rajasthan. *Rajasthan J. Extn. Edu.*, **20** : 35-38.