

Forage Productivity Enhancement through Front Line Demonstrations in Sawaimadhapur District of Rajasthan

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Abstract

The frontline demonstrations were conducted in fodder sorghum, oat and berseem crops during the year 2010 to 2014 on 320 farmer's fields covering 35 different villages of Sawaimadhapur district. Technological interventions demonstrated mainly comprised of improved varieties and cutting management along with recommended agronomic practices. The results of demonstrations clearly revealed that improved varieties along with recommended agronomic practices enhanced the fodder yields during all the five years of demonstration. The average production using SSG-59-3 variety of fodder sorghum demonstration were recorded 22.5 to 44.7 per cent higher than farmers local variety. Oat forage yields using Kent and JHO-822 varieties were enhanced in the range of 14.2 – 23.0 and 25.9- 28.0 percent, respectively. Improved varieties of berseem, Vardaan and Bundel Khand-2 resulted in forage yields increments to the extent of 28.8 and 36.6 per cent, respectively over farmers practice. Farmer's were also found greatly convinced with the high yielding varieties of fodder sorghum, oat and berseem due to higher yield.

Key words: Berseem, Forage demonstration, Fodder sorghum, Oat

Introduction

India, with only 2.29 per cent of the land area of the world, is maintaining about 10.71 per cent of the world's livestock population. The area under fodder cultivation is estimated to be about 4 per cent of the gross cropped area which has remained static for the last four decades and availability of green fodder is estimated to be only 143 million tones as against demand of 222 million tones representing a short supply of 36 per cent (GOI, 2013). The grazing lands are also gradually diminishing because of other competing pressures on land. The shortage of fodder for livestock is primarily owing to the large population of livestock, and the limitations to increase the area under fodder cultivation due to the priority required to be given to food grains and other cash crops.

Dairy farming is the important subsidiary occupation of farmers in Sawai Madhopur district which is providing subsistence to the majority of small and marginal farmers. There are 1.10 lakhs cows and 3.18 lakhs buffalo population with average milk productivity of 3 to 5 litre in the district. Beside poor genetic potential, improper health and management,

inadequate supply of forage are considered as important factors responsible for low productivity of animals. There exists a huge gap in availability and supply of green feeds and this is one of the major constraint in enhancing milk productivity in the district. Forage crops cultivated in the district Sawaimadhapur in area of around 8500 and 6689 ha during kharif and rabi seasons; respectively (Anonymous, 2014). Fodder sorghum and bajra chari are mainly grown during kharif season and during zaid in limited area. Berseem and Lucerne are major rabi forage crops grown in the district. There is hardly any scope for expansion in area under fodder crops because of already existing pressure on agriculture land for food and cash crops.

Fodder sorghum is the most important forage crop of Northern India and can be grown over a wide range of soils. It is nutritious and palatable and can be fed as green, dry or as conserved fodder in the form of silage or hay. Berseem or Egyptian clover (*Trifolium alexandrinum L.*) is popularly known as the king of fodder crops for irrigated condition of Northern India. It is available for 6-7 month from November to May, give 4 to 6 cuts during winter, spring and early summer seasons and provides nutrition, succulent and palatable forage. Oat is one of the most important cereal fodder crops of rabi season in North, Central and West Zone of the country. It provides soft and palatable fodder rich in crude protein. Oat is also

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used as straw, hay or silage.

Therefore, to meet the rising demand for fodder, it is exigent to augment our fodder resources by adopting improved package of practices. Organization of demonstrations is most effective tool for transfer of feasible technologies among the farmers. Therefore, fodder demonstrations were conducted on selected farmer's fields of the operational area of Krishi Vigyan Kendra, Sawaimadhopur. The main objective of fodder demonstration was to increase the number of fodder cultivating farmers as well as increase the area of fodder cultivation in the district.

Materials and Methods

Demonstrations were conducted in fodder sorghum, oat and berseem crops the year 2010 to 2014 on 320 farmers fields covering 35 different villages of Sawaimadhopur district. Soils of the study area are loamy to clay loam in texture with low nitrogen, low to medium phosphorus and high in available potassium. Technological intervention demonstrated mainly comprised of improved variety seed along with recommended agronomic practices. The farmers were also suggested for using optimum seed rate, recommended doses and method of for efficient use of fertilizers, need based weed and pest management. Selected farmers were provided trainings on fodder production techniques. Monitoring of FLD sites were done by periodical visits and needful suggestion were given to the farmers. Data related to yield were collected separately for demonstration and farmers practice.

The peculiarities of the forage crop varieties used under demonstrations are as follows (Pandey and Roy, 2011).

SSG 59-3 (Meethi Sudan): The variety was developed by CCS HAU, Hisar and released in 1977 for all sorghum growing areas in the north zone of the country. It is derived from pedigree selection of non sweet sudan grass \times IS-263. The variety is tall and profuse tillering

with quick growth. It is tolerant to drought and water logging. The stems are sweet and thin. The variety produces 75 t/ha green fodder and 22 t/ha dry fodder.

Kent: This oat variety was released in 1975 and is an introduction from USA. The variety has been notified for cultivation in the entire country. It is medium late and erect type with long droopy leaves. Average plant height at 50% flowering is 75–80 cm. It is resistant to rust, blight and lodging. It yields about 50 t/ha of green fodder.

JHO-822: A multi-cut oat variety developed at IGFRI, Jhansi from a cross between IGO-4268 \times Indio-6-5-1 following inter-varietal hybridization and pedigree

method of selection. It was released in 1989 for cultivation in central zone of the country. The variety has erect growth habit and glabrous nodes. It takes 95–100 days for flowering and matures in 125–130 days. The fodder yield is 50 t/ha green and 12 t/ha dry.

Wardan: The berseem variety has been evolved through selection by IGFRI, Jhansi from the

large genetically diverse polyploid material and released in 1981. The plant habit is erect, flower colour is white, days to 50% flowering is 150–165 days, days to maturity in 175–190 days, head colour is brown which possess 80–90 pale yellow coloured seeds. It provides green fodder yield 70–75 t/ha and dry fodder 12–15 t/ha. This is a diploid variety of berseem. Its growth is slow in cold temperatures and fast in rising temperatures at the end of winter season.

Bundel Berseem-2 (JHB-146): The variety has been bred through mass selection by IGFRI, Jhansi from indigenous material no. 25776 followed by pedigree selection. This variety flowers in 150–160 days and matures in 180–190 day. The plant height ranges from 55–65 cm under optimal cutting regime. It has dark green leaves. The crop is fairly tolerant to acidic conditions and is fertilizer responsive. The green fodder yield is 90–100 t/ha. It is released for cultivation in central zone.

Results and Discussion

The data presented on average fodder yield (Table.1) clearly indicates that improved practice of demonstration enhanced the fodder yield during all the five years (2010 to 2014). The data showed that the SSG-59-3 variety of fodder sorghum enhanced the fodder yield to the extend of 42.8 to 89.0 q/ha which was 22.5 to 44.7 per cent higher over farmers local variety. On the other hand, the average increase in oat forage production using Kent and JHO-822 varieties were in the range of 14.2–23.0 and 25.9–28.0 percent, respectively with an additional forage yields of 41.5 to 85.0 q/ha. Similarly, Wardaan and Bundel Khand-2 varieties of berseem improved forage yields to the extend of 28.8 and 36.6 per cent, respectively over farmers practice. Farmer's were also found greatly convinced with the high yielding varieties of fodder sorghum, oat and berseem due to higher yield advantage.

Constraints for Forage production

Majority of the farmers are small holders, who are unable to use their holdings for fodder cultivation, for others, cultivation is a loss of opportunity to earn higher income by cultivating other high value cash crops. The major fodder crops cultivated in the district Sawaimadhopur are sorghum, oats, lucerne and berseem because of easy availability of seeds of

Table 1: Productivity of green forage on farmers fields under improved practices

Crop	Season	Variety	Area of Demons. (ha)	No. of Demon.	Yield (q/ha)		% increase over FP
					DP	FP	
Fodder Sorghum	Kharif, 2010	SSG-59-3	5.00	20	232.8	190.0	22.5
	Zaid, 2011	SSG-59-3	2.00	20	240.0	191.9	25.1
	Kharif, 2012	SSG-59-3	3.00	30	288.0	199.0	44.7
	Kharif, 2013	SSG-59-3	3.00	30	244.0	201.6	21.0
Forage Oat	Rabi 2010-11	Kent	1.25	20	334.5	293.0	14.2
	Rabi 2011-12	JHO-822	5.70	57	355.0	282.0	25.9
	Rabi 2012-13	Kent	4.30	43	455.0	370.0	23.0
	Rabi 2013-14	JHO-822	5.00	50	337.0	263.4	28.0
Berseem	Rabi 2011-12	Wardan	1.00	25	859.0	667.0	28.8
	Rabi 2013-14	Bundel Khand-2	1.00	25	784.0	574.0	36.6

DP- Demonstration practice

FP- Farmer's local practice

improved varieties. However these crops apart from good quality seeds requires good quality land, assured source of water, higher doses of fertilisers and regular care. Cultivation of forage and regular harvesting almost on a daily basis, demands a large number of workforce which is very expensive. In the absence of efficient preservation and storage techniques, chances of huge wastage of fodder are likely. Hence farmers are reluctant to make heavy investments on fodder production. Dairy farmers who have undertaken forage production are not able to optimise the yields and maximise the returns due the factors such as poor quality soils, inadequate fertiliser application, moisture scarcity, improper timing of sowing and inadequate facilities to transport and store the forage.

Strategies for enhancing Forage production

Strategies for enhancing forage development includes selection of suitable forage crops and varieties

to suit the local agro-climatic conditions, availability of good quality certified seeds, improving the yields through improved production techniques, preserving surplus forage into silage and hay and creation of marketing opportunities to sell the forage at remunerative prices.

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