

Fodder based diversified crop farming

for enhancing farmers income in Bundelkhand region

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Indian agriculture and animal husbandry are integrated to each other and this scenario is expected to continue in the foreseeable future. Bundelkhand, a chronically drought prone region of country had been a contrasting feature due to extreme climatic condition. Deficiency in feed and fodder is identified as one of the major constraints in achieving desired level of livestock productivity. Apart from lower productivity, damage caused by army of uncontrolled cattle to crops following Anna Pratha tradition in absence of fodder has further worsened farmers' condition in the region.

Key words: Bundelkhand, Crop farming, Diversified apiculture, Income

BRIDGING the gap between demand and supply of feed and fodder is indeed a matter of great concern for scientific community and researchers. The paradox of this region is the availability of surplus fodder during monsoon and deficit in fodder during lean season. Thus, there is a need to identify the crops that can be grown between the two crop seasons in order to bridge gap of demand and supply of fodder as well as to sustain farming communities.

Under “Mera Gaon Mera Gaurav”, ICAR-IGFRI, Jhansi took initiative to reach constraint facing farmers to spread the various fodder technologies developed by the institute over the years by organising different programmes like *kishan ghosti*, farmers training, awareness programmes, field demonstrations etc. at farmer's field. Cluster of villages namely Pathra, Rajapur, Makoni, Govindgarh and Khairy, Datia, Madhya Pradesh were selected to demonstrate the fodder technologies. This region is rainfed, so drought is common which leads to crop failure in most of the season. With the cooperation of few

progressive farmers of these villages, institute have been able to deliver recent developed technology in the villages. Technology deliverance at farmers' field and its acceptance by few farmers will be motivating factors for others to come up out of their own defined boundaries and practice new technology to enhance their income. Out of them, Sri

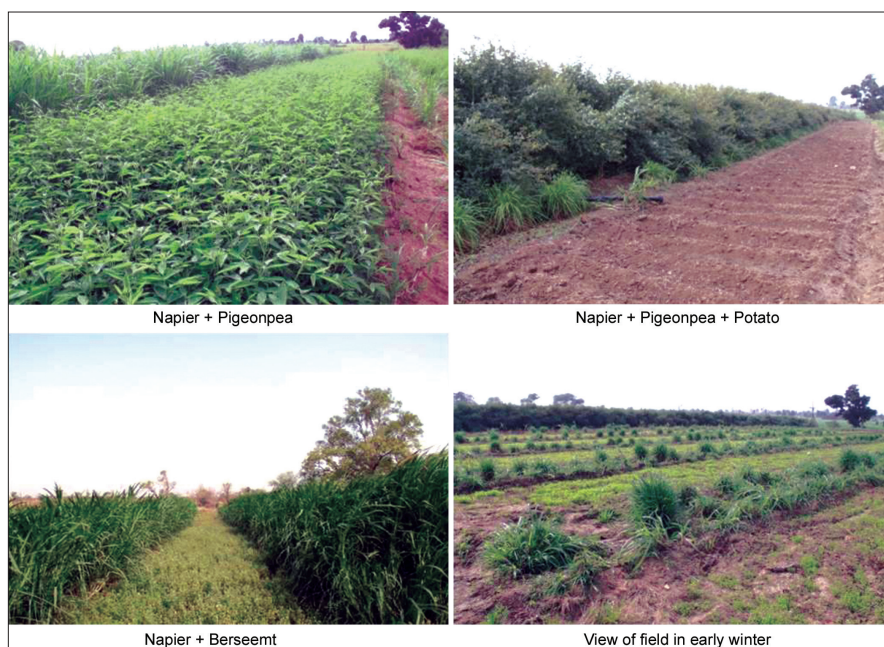
Haisankar, one of progressive farmers, not only helped in transferring the forage technology to the other villagers but also made a paradigm shift in Datia district of Bundelkhand region by adopting new proven technology.

About farmer

Mr. Harisankar is a resident of



Awareness camp on forage production, animal health and village cleanliness



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village Pathra, district Datia (MP) met out his green fodder demand very easily by adopting crop diversification technique. His family and livelihood is dependent on five hectare land and six cattle. Out of 5 ha, 2 ha is irrigated by well, 2 ha by canal but remaining 1 ha is under rain fed. Spatial and temporal variation in rainfall has been the major constraints in the agricultural practices. During *kharif* urd, sesame, pigeon pea and in *rabi* season wheat, pea, berseem, potato and during summer tomato, brinjal and chilli were grown by him (Table 1). Before intervention, he purchased feed and fodder for his animals from local market. Like other famers of the village, he did not have any knowledge on organized fodder cultivation. Shri Harishankar was motivated by the team to adopt diversified crop farming system with intercropping food, pulse, fodder, vegetables crop so that he can feed both his family and animals.

Intervention from Institute

He showed his interest on Napier grass, its cultivation practices and benefit. He took 250 rooted slips and transplanted in strips at an area of 1 acre in April. He made 8 strips of Napier root slip with a spacing of 0.5 m × 1.0 m. He was suggested to use the inter row spaces for early and late sown pigeon pea during *kharif*

tomato, brinjal and chilly during summer and berseem, potato during winter. With suggested intervention, Mr Harisankar's income increased nearly by two fold over traditional farming system. The diversified cropping (NB hybrid + pigeon pea – berseem + potato - NB hybrid) have yielded gross income/ha ₹ 134,700 whereas traditional farming (groundnut-wheat) have yielded gross income/ha ₹ 60,625 with same number of animals and land resources. It is an example of direct outcome of the intervention of MGMG team in that village. He earned additional income of ₹ 84,120 from dairy (6 buffalos) as fodder crop led to increment in milk production and saving in fodder cost which he purchased earlier. In addition to that

Table 1. Impact of MGMG intervention on socio-economic status of a progressive farmer, (Shri Harishankar Yadav village, Pathara District, Datia, MP)

Parameter	Farmer's status	
	Before intervention in 2014	After intervention in 2017
Total land holding	5 ha	5 ha
Number of livestock	6 (3 milch)	6 (3 milch)
Irrigation	Irrigated 4 ha (well-2 ha, canal-2 ha)	4.5 ha (well-2.5 ha, canal-2 ha)
	Unirrigated 1 ha	0.5 ha
Crop production	<i>Kharif</i> Til-1 ha; Fallow-2 ha; For animals: Nil	Urd-2 ha; Urd-2 ha; Til-1 ha; Fallow-1.75; For animals: NB hybrid-0.25 ha
	<i>Rabi</i> Wheat-2 ha Pea/ chickpea-2 ha	Wheat-2 ha Pea/chickpea-1.5 ha Arhar-0.25 ha Potato, vegetables-0.2 ha Fallow-0.5 ha; For animals: NB hybrid-0.25 ha; Berseem-0.3 ha
Feed and fodder source	market Cake-1.5 q/month Oat-50 kg/month	Cake-0.5 q/month Oat-nil
	Own field Nil	NB hybrid, berseem
Milk per day	20 lit	30 lit
Milk consumption	8 lit/day	10 lit/day
Income per day from milk	₹ 300/- (12 litre @ ₹ 25/- per litre)	₹ 600/- (20 litre @ ₹ 30/- per litre)
Perception of the farmer	- Shortage of feed and fodder - Feed was purchased from local market - No green fodder during lean period - Low milk productivity during lean period	- Sufficient fodder from own field - No need to purchase from market - Green fodder is available during lean period - Milk productivity is satisfactorily maintained during lean period - Income was enhanced - Cost of rearing was reduced

I. Production and income status of 1 acre land

Production	Production (q or no. of roots)	Rate (₹/q or per root)	Income from land (₹)
Potato	30	800	24,000
Pigeon pea (short duration)	3.5	10000	35,000
Pigeon pea (long duration)	0.4	15000	6,000
NB Hybrid (IGFRI 6)	265	100	26,500
Berseem fodder (Wardan)	268	150	40,200
Berseem seed	0.15	125	1,875
Sale of rooted slips	6000	0.5	3,000
Gross income/Acre			13,6575
Cost incurred/Acre (Excluding rent, rental value, interest etc.)			35,248
Net income/acre			101327
BC ratio			2.874688

II. Additional income from system

Particular	Production in excess (Litre)	Saving in feed (kg/year)	Rate (₹/l or per kg)	Income (₹)
Milk increment /lactation for 6 buffaloes	450		32	14,400
Concentrate	-	540	18	9,720
Wheat straw	-	4,500	4	18,000
A. Additional income /saving			42,120	
B. Net Income/Acre				101,327
Total Income (A+B)				143,447

III. Traditional cropping system (Previous history of the land)

Production	Production (q or no. of roots)	Rate (Rs/q or per root)	Income from land (₹)
Ground nut	2.5	4000	10,000
Wheat	25	1625	40,625
Wheat straw	25	400	10,000
Total gross income			60,625
Cost incurred/Acre (Excluding rent, rental value, interest etc.)	-	-	15,200
Net Income/Acre			45,425

IV. Benefit from diversified crop farming system over traditional system

₹ 14,3447 - ₹ 45,425 = ₹ 98,022

farmer also sold rooted slips 5,000 @ ₹ 0.50/slip amounting ₹ 2,500 to others.

Secrets of success

The secrets of his spectacular success besides his hard work and prompt action taken according to the advices given to him time to time are:

1. The foremost reason of his success was to use inter-row spaces by various crops.
2. He is now getting sufficient fodder for his six cattle besides having extra earnings from the sale of rooted slips costing ₹ 5-6/kg.
3. Feeding Napier grass to the cattle increased milk production by 10% leading to further additional income from the sale of milk.
4. Green fodder availability during lean period reduced total expenditure on the purchase of feed and fodder drastically.

CONCLUSION

Sri Harisankar said that it gives a lot of satisfaction when he goes for morning walk and sees his Napier crop in the hot summer days. Because of Sri Harisankar's exemplary work, many farmers of that area and nearby villages have started taking Napier on the farm bunds to meet out the fodder demand particularly during lean periods by making at least three to four cuts per year.

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