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Theme 3. Sustainability of grasslands- social and policy issues

Sub-theme 3.1. Multi-stakeholder learning platforms for grassland management

Rejuvenation of wild Ber (*Zizyphus* species) through budding at farmer's field**Ravi Pratap Singh*, Satendra Kumar, R. K. Agrawal, Sunil Kumar, M. M. Das, J. B. Singh**

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*Corresponding author e-mail: thakurravi8299@gmail.com**Keywords:** Budding, Fruiting, Resistant, Silage, Wild ber**Introduction**

Ber is mainly cultivated for its fresh fruits, which are rich in vitamins C, A and B complex. Due to its nutritional qualities it is called poor man's apple (Gajbhiya *et al.*, 2003). A large number of wild ber shrubs (*Zizyphus mauritiana*, *Z. rotundifolia* and *Z. nummularia*) were seen growing on the neglected lands, uncultivated lands, roadsides and farm boundaries in Kadesara Kala Village in Lalitpur district of Uttar Pradesh (India). Production potential of this species is very low because of poor upkeep and inferior genetic makeup. But they have extensive root system which can withstand prolonged drought and has capability to regenerate even if the shoot system is damaged completely (Batahr, 1990). They are also responsibly resistant to common insect and pest. Therefore, these species offer an excellent production potential from the degraded lands of Bundelkhand region of India (Sharma and Tiwari, 1994; Tiwari and Sharma, 1993) after *in-situ* budding with improved cultivars. It also provides sufficient leaf biomass (pala) which can be utilized as fodder in lean period and also suitable for hay and silage for goat as it contains 11-13 percent crude protein (Tewatia and Khirwar, 2002). Pruned twigs/stems of ber also meet, to some extent, the fuel wood requirement in rural areas (Kumar *et al.*, 2004).

Materials and Methods

Naturally occurring species of Jujube (*Zizyphus* species) at 10 tree/ shrubs with each farmers were selected for this programme in 2011. These shrubs/tree can be converted in more productive through top working/ head back and subsequent budding with better cultivar namely "Banarasi Karaka" and "Gola", which is most suitable for Bundelkhand region (Kumar and Ram, 2009). Keeping the above facts in view, 100 wild ber shrubs growing at 10 farmers field were beheaded retaining a clean trunk at height 0.75 - 1.5m in the month of April, 2011.

Beheaded shrubs started sprouting in end of May and shoots gained buddable thickness (pencil thickness) after about 45-60 days. The ring budding was done in first week of July 2011. On each tree, 2-3 shoots were budded at a height of 15-20 cm from the base of shoot emergence with the scion of Banarasi Karaka and Gola and others remaining shoots were removed. Branches below the bud juncture were also removed and no shoot below bud union was allowed to grow. Bud union maturity takes place in 10 days approximately. Thereafter, the top of budded coppices were removed. Farmers were advised that the budded shoot should be maintained clean by removing side shoots emerging below the bud union from time to time. The programmer was evaluated for its economic viability for the first 3 year during 2011-2014.

Results and Discussion

A success rate of 86% was noticed at after 150 days of budding. The most important aspect of the programme was that fruiting started in the first year. Similar finding was also reported by Sharma and Diwaker (1989). The average production of fruit per tree was 1.04 kg, 3.5kg and 5.2 kg respectively in 1st year, 2nd year and 3rd year of budding in case of Gola Cultivar. Similarly, cultivar Banarasi Karaka produced 0.7 kg, 2.5kg and 3.9 kg during the same period. On an average farmer received net income of Rs. 100-520 /year respectively in 1st year, 2nd year and 3rd year of budding without making any extra effort.

Sr. No.	Farmer's Name	Scion cultivar		Total	Failure	Budding success (%)	Fruit Yield/tree(kg)					
		Gola	Banarasi Karaka				Gola			Banarasi Karaka		
							1 st year	2 nd year	3 rd year	1 st year	2 nd year	3 rd year
1	Sh Mohan Kushwaha	6	4	10	0	100	1.1	3.6	5.9	0.8	2.7	4.9
2	Sh Nannu Ahirvar	4	6	10	1	90	1.2	3.5	4.3	1.3	2.9	3.9

3	Sh Devaki Kushwaha	6	4	10	1	90	0.8	4.2	6.2	0.3	3.5	4.5
4	Sh Rajpal Bundela	5	5	10	1	90	1.5	3.1	4.8	0.9	2.4	3.5
5	Sh Mithailal Kushwaha	3	7	10	2	80	0.7	3.6	5.6	0.4	2.9	4.2
6	Sh Govinddas	5	5	10	1	90	0.5	2.9	4.9	0.3	1.5	3.6
7	Sh Dujje Kushwaha	6	4	10	0	100	1.5	5.2	6.2	0.9	3.8	4.2
8	Sh Hariram Kushwaha	5	5	10	5	50	1.2	2.9	4.0	0.9	1.6	2.9
9	Sh Ganpat Kushwaha	6	4	10	3	70	1.5	3.2	5.1	0.8	2.6	4.1
10	Sh Lakhan Lal	5	5	10	0	100	0.4	2.5	4.9	0.2	1.6	3.6
Total				100	14	86	1.0	3.5	5.2	0.7	2.5	3.9

Conclusion

Wild ber shrubs species having an excellent production potential from the degraded lands could be utilized through in-situ budding with improve cultivars. It provides fuel wood/ fencing material through pruning, leaf biomass (pala) and god fruiting that improved income and nutritional security of the farmers without making any extra effort.

References

- Batahr, A.S. 1990. Trees in Wadi Hadramont rangelands with particular reference to *Acacia*, *Propolis* and *Zizyphus spp.* *Range Mgmt. & Agroforestry*. 11(1): 643-648.
- Gajbhiya, V. T, P. Sinha, S. Gupta, C. P. Singh and R. K. Gupta. 2003. Efficiency of persistence of carbendazim following pre- nad post-harvest application in Ber (*Zizyphus mauritiana* L.). *Annals of Plant Protection Science* 11:154-58.
- Kumar, S., S. N. Ram, M. J. Baig and M.M. Roy. 2004. Productivity of ber based hortipastoral system on red alfisol: Effect of pruning intensities and pasture combinations. *Indian J. Agroforestry* 6(1): 23-26.
- Kumar, S. and S. N. Ram. 2009. Ber Based Hortipastoral System as influenced with pruning intensities, pastures and weather *Indian J. Agroforestry* 11 (2) : 23-26.
- Sharma, A. K. and Tiwari, R.K. 1994. Rejuvenation of *deshi ber* under the agroforestry system. *Agroforestry Newsletter* 6(1&2): 6-7.
- Sharma, S.K. and Diwakar, G.D. 1989. Economic evaluation of hortipastoral system in arid region of western Rajasthan. *Indian J. Range Mgmt.* 10(2): 119-122.
- Tewatia, B. S. and S. S. Khirwar. 2002. Utilization of ber (*Z. mauritina* L.) leaves hay and silage in goat. *Indian J. Animal nutrition* 19(4): 329-333.
- Tiwari, R.K. and Sharma, A.K. 1993. Studies on the growth performance of rejuvenated ber (*Zizyphus spp.*) plant under agroforestry system in Bundelkhand region. *Rang Mgmt. & Agroforestry*. 14(2): 179-183.

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