Harnessing Productivity Potential of Small Millets in Himalayan Hills

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ABSTRACT

The demonstrations were laid out in farmers' fields to show the potential of the technologies generated to the growers as compared to local practice usually followed by the farmers in the locality in order to increase the production of millet crops viz: finger millet & barnyard millet. Full recommended package of practices were demonstrated along with the local check plots where existing farmers' practice was kept. This study clearly elucidated that it will be appropriate to use the total package of technologies developed by the scientists for boosting the productivity. Yield of demonstrations was significantly higher (16.5 q/ha & 16.6 q/ha) as compared to local check plots (10.5 q/ha & 9.88 q/ha) for finger millet & barnyard millet, respectively. There was 53.5 to 61.3 per cent increase in yield over local check for Finger millet & for Barnyard millet which was increased 53.5 to 101.8 per cent. By conducing effective frontline demonstrations of proven technologies, yield potential of the crop can be increased to a great extend.

Key Words: *Small Millet; Package of practices*

In India, after the green revolution much emphasis was given to agriculture and with the innovations and new techniques, substantial progress has been made in food grain production. But still considerable portions of the farming community have not yet adopted the modern farming technologies. However, quick dissemination of technological information from the agricultural research system to the farmers in the field and reporting of farmers feed back to the research system is one of the critical inputs in the transfer of agricultural technology (Sharma,2003). Farmers can no longer depend on the conventional and time consuming manual operations.

The concept of 'Front Line Demonstration' may be applied to all farmer-categories for changing the attitude, skill and knowledge of improved/recommended practices of high yielding varieties including adoption, speedy and wider dissemination of the recommended practices to other members of farming community (Singh et al.,2005).

In Uttarakhand hills, about 90 per cent area is rain fed and traditional crops like small millets (finger millet, barnyard millet, etc.), under utilized crops like buckwheat, amaranthus, rice bean, gahat, etc are grown in kharif season. Small millets are the important cereal crops of the Himalayan hills raised under limited moisture conditions in vast areas but the average productivity is very low i.e. 13.7 q/ha for Finger millet and 12.2 q/ha for Barnyard millet only. Other reasons of low productivity are the use of local genotypes, sowing of seeds by broadcasting, poor soil fertility, coupled with no use of fertilizer and manures, no seed treatment and lack of plant protection measures. To improve the productivity of finger millet and barnyard millet GBPUAT, Hill Campus, Ranichauri initiated the Front Line Demonstration Programme under the AICSMIP on Small Millet and Directorate of Millet Development, Jaipur. We observed the impact of improved production technology on the performance of this crop as compared to local practice usually followed by the farmers in the locality in order to increase the production of millet crops.

METHODOLOGY

The present study was conducted from the random sample number of demonstrations in Tehri Garhwal and Uttarkashi districts. The data was from different villages of Tehri and Uttarkashi districts for five years. In total, 439 demonstrations for finger millet & 214 demonstrations for barnyard millet in different villages of above said districts were laid out in farmers' fields to show the potential of the technologies generated to the growers. As far as possible full recommended package of practices were demonstrated along with the local check plots where existing farmers practice was followed. In demonstrated area, the annual rain fall received is 1240 mm and soils of the area under study are sandy loam to clay loam and poor in fertility. In demonstration plots, some inputs of

like seed of improved varieties, fertilizer, manure, etc. were provided. About 7.5 t/ha of well decomposed FYM were added to the soil just after received of first shower and mixed thoroughly in the soil. About 1/3 of the recommended dose of Nitrogen and full dose of Phosphorus were given at the time of sowing as plough sole placement. Timely sowing in lines with 20 x 7 cm geometry by way of thinning was followed at 30 days after sowing. The population of weeds was kept under control by hand weeding done twice in the crop season. Whereas, in case of local checks, the traditional practices were maintained. The technology demonstrated are mentioned in Table -1 and compared to local practices.

Table 1. Package of practices of Finger millet and barnyard millet under Frontline Demonstration

S.No.	Operations	Existing practice	Improved practice demonstrated
1	Use of seed	Local seed	Improved high yielding disease resistant varieties VL 149,PRM-9802
2	Sowing time	Late sowing	Appropriate planting time
3	Sowing method	Broadcasting	Line sowing- Row spacing- 20 cm Plant spacing -7 cm Depth of sowing - 5 cm
4	Seed treatment	Not done	Seed treatment with bio fertilizer i.e. *Tricoderma harjianium*, *Azospirilum awamori*
5	Seed Rate	5.0 kg /ha	2.0 kg /ha
6	Fertilizer	Not used	Nitrogen was applied through Urea and Phosphorus through DAP @ 40 : 20:20
7	Insect pest control	Not done	Protection measures adopted as per need
8	Harvesting	Some green or some dry	Done at 17% moisture in seed

RESULTS AND DISCUSSION

These observations clearly elucidated that it will be appropriate to use the total package of technologies developed by the scientists for boosting the productivity of finger millet & barnyard millet (Table 2 &3). As it is evident from data given in Table 2&3 that farmers were pleased with the productivity level which was excelled in the tune of 16.5 & 16.6 q/ha as compared to the average productivity of Uttarakhand i.e. 13.7 q/ha & 12.2 q/ha for Finger millet & Barnyard millet, respectively, whereas, the average national productivity of millets crop is 15.34 q/ha (2005-06).

During the period under study (2003 to 2007) it was observed that yield of demonstrations was significantly higher (16.5 q/ha & 16.6 q/ha) than local check plots (10.5 q/ha & 9.88 q/ha) for Finger millet & barnyard millet, respectively as shown in Table 2 & 3. However, the year wise fluctuation in yield was observed mainly on account of variation in rainfall and mixed season dry spells.

Average yield level of Finger millet varied from 8.56 to 15.11 q/ha in local check and 13.63 to 23.2 q/ha in demonstration plots. Average yield of Barnyard millet varied from 9.6 to 11.2 q/ha in local check and 13.6 to 22.6 q/ha in demonstration plots.

Table 2. Yield of finger millet under demonstration and local check practices

S.No.	Year	Area (ha)	No. of demons.	Average Yield (kg/ha)		% increase over farmer practice
				Demonstration	Local	
1	2003	2.62	86	23.2	23.2	53.5
2	2004	1.55	55	15.7	15.7	57.5
3	2005	1.00	70	13.7	13.7	59.3
4	2006	3.76	76	14.9	14.9	58.8
5	2007	10.6	152	15.0	15.0	61.3

There was 53.5 to 61.3 per cent increase in yield over local check for Finger millet & for Barnyard millet this increase was 53.5 to 101.8 per cent. Increase in yield to the extent of 61.3 & 101.8 per cent for FM & BM was due to combined effect of high yielding disease resistance variety, appropriate sowing time, adopted methods, fertilizer application, practices adopted under the demonstrations. Low productivity of finger millet under local check plots was mainly due to use of low yielding long duration local genotypes with application of fertilizer.

The local genotypes are very much prone to blast disease. On an average, there was 58.1 % & 68.1 % increase in grain yield over local check for Finger millet for Barnyard millet, respectively.

Table 3. Yield of Barnyard millet under demonstration and local check practices

S.No.	Year	Area (ha)	No. of demons.	Average Yield (kg/ha)		% increase over farmer practice
				Demonstration	Local	
1	2003	4.94	22	22.6	11.2	101.8
2	2004	1.00	21	15.7	10.2	53.5
3	2005	1.00	30	13.6	8.6	57.8
4	2006	3.22	46	15.4	9.8	57.3
5	2007	5.90	95	15.9	9.6	66.7

Constraints and perspectives:

1. Crop production in this rainfed area depends on "Mercy of God" in the form of onset of monsoon rainfall, its distribution. The crops vary often suffer from aberrant climatic conditions like delayed of set of monsoon, some time heavy monsoon and some time long dry spells.
2. It was observed that during initial years farmers were not ready to use the new seed even when supplied of free of cost. However, the problems were solved through training and visit of farmers to the research farm as field days were also organized at farm.
3. Millet production in such rainfed areas can be increased by the introduction of short duration, disease resistance genotypes like VL 149 or PRM 9802. These varieties were characterized by high yielding potential, blast disease resistance. It also response to fertilizer application.
4. Farmers can do seed multiplication of these varieties and may be used it year after year. KVK is also providing truthfully leveled seed to the farmer of the area.
5. The seed of Finger millet and Barnyard millet is being spread among other fallow farmers through these demonstration farmers as well as other sources supply seed of millet including these KVK's.
6. Since last 5-6 years the variety has replaced almost 50% of the local seed and is expected to cover 90% area in a couple of years to come.

CONCLUSION

Hence, by conducing effective Frontline Demonstrations of proven technologies, yield potential of the crop can be increased to a great extend. The technology suitable for rainfed areas similar to Tehri, Pauri and Uttarkashi districts of Uttarakhand should be evolved and brought to assess the farmers through transfer of technologies centers.

REFERENCES

1. Sharma, V.P. (2003). Cyber Extension: Changing the Face of Indian Agriculture. www.gisdevelopment.net/proceedings/mapasia.
2. Singh, Narahari Ng., Prasad, Angad and Daya Ram (2005). Front Line Demonstration on rice in Manipur. *Agricultural Extension Review.* May- June – 6-7.

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