MEGHA TURMERIC -1: POPULARIZATION THROUGH FARMERS' PARTICIPATORY MODE IN MEGHALAYA: A SUCCESS STORY

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INTRODUCTION

In Meghalaya more than 80% farmers are directly or indirectly dependent upon agriculture. The agro ecological conditions of the state provide immense opportunity for the commercial exploitation of the horticultural crops. Among the horticultural crops, spices found integral space in the socio-economic life of the tribal farmers and recorded an area of 19.40 thousand ha with the production and productivity of 99.80 thousand tones and 5.14 tones/ha, respectively, in Meghalaya state of north east India during 2012-13 (Anonymous, 2013). Among the spices, turmeric (*Curcuma longa* L.) is an important crop cultivated by the farmers in the state having high market potential (Singh, 2010). Turmeric is extensively used as stimulant, blood purifier, tonic as carminative and remedy against the skin diseases, pain and anthelmintic (Sirmal, 5). The Lakadong variety of turmeric is indigenous to the state. But variety has low yield potential coupled with susceptibility to leaf spot and leaf blotch which limits its further expansion. A new variety named as Megha Turmeric-1 is a promising turmeric cultivar developed by the ICAR Research Complex of NEH Region, Meghalaya through clonal selection form Lakadong. This variety is suitable for mid hills condition, takes 300 to 315 days for crop maturity. The average yield of rhizome per clump is 350-425 g with yield potential of 270 q/ha. Further, it contained 16.37 % dry matter, 6.8 % curcumin and 5.5 % essential oil and highly tolerant to leaf spot and leaf blotch (Yadav *et al*., 2009). MegaTurmeric-1 has showed high stability for dry yield across environments (10 locations) and could serve as a good genetic source for stability in breeding programs for high dry yield and curcumin content (Anandaraj *et. al*., 2014).

During last decade the demand of turmeric (fresh & dry) from the state increased substantially. But availability of quality seed material was one of the important bottlenecks in expansion of area, which ultimately hamper production and productivity. So, increase in availability of quality planting material (Megha Turmeric-1) is need of hour for tapping the available potential in turmeric trade. Production of turmeric through farmers' participatory mode is way ahead to fulfil the fast growing demand for turmeric from various stakeholders. This will create employment opportunity and helps in development of entrepreneurship in tribal farmers.

METHODOLOGY

With intensive survey and village level meetings with farmers, the interested farmers groups (SHGs) were identified for turmeric cultivation at Ri-Bhoi district of Meghalaya during 2013-14. The details about scientific turmeric cultivation practices, its importance and potential of the selected area were discussed with Self Help Groups (SHGs). Hands on trainings were organized for the selected SHGs along with the exposure visit to research farm. Total eleven SHGs involving 122 farmers of nine villages were selected for front line demonstration of Megha Turmeric-1 variety. The total 135 q seed material @ 18 q/ha were distributed to SHGs for turmeric cultivation on 7.5 ha area. The details of the SHGs involved and their village, area covered was depicted in Table 1.

Table 1. List of SHGs involved in the turmeric cultivation

	Name of SHGs	Name of Village	Area (ha)
1.	Demkhtop SHG	Mawteng,	1.0
2.	Iaiminot SHG	Rtiang (Umsning)	1.0
3.	Honey Dew Multipurpose Cooperative society	Umroi Nongrah	1.0
4.	Roilang Farmers' Club	Umjarasi, Nongpoh	1.0
5.	Pynroilang SHG	Liarbang	0.5
6.	Symboh Barit SHG	Liarbang	0.5
7.	Kyntiewlang SHG	Rongsikong, Nongpoh	0.5
8.	Chriatian Hope Ministry Society	Sohriewblei	0.5
9.	Imlang SHG	Umshit, Nongpoh	0.5
10.	Tiki & Chinthur SHG	Belkuri, Nongpoh	0.5
11.	Melur SHG III	Belkuri, Nongpoh	0.5
Total			**7.5**

Scientific management practices for turmeric recommended by Yadav *et al.,*(2009) were followed. The land was ploughed 4-5 times to bring the soil into fine tilth and the raised beds of about 15 cm height were made. The turmeric rhizomes were planted in the raised bed at a spacing of 30 cm x 30 cm during April-May. The FYM 20 t/ha was applied at the time of field preparation followed by N:P:K @ 120: 90:90 Kg/ha. The $^{1}/_{3}$ nitrogen and full doses of phosphorus and potassium were applied at the time of planting and $^{1}/_{3}$ quantity of nitrogen was applied at 45 days after planting and remaining $^{1}/_{3}$ of nitrogen at 90-95 days after planting. The first weeding was done in June followed by subsequent hoeing and earthing up from July to September at fortnightly intervals. Mulching was done with locally available materials like green leaves; dry grasses and paddy straw. The crop was ready for harvesting after 8-9 Month of planting (Dec-Jan). The cultivation practices followed are depicted in Photographs 1-8. Observation on fresh turmeric yield (q) and productivity (q/ha) were recorded at all selected locations. The cost of cultivation of different inputs *viz.,* planting material, FYM, fertilizers, agrochemicals and labour incurred by the SHGs were calculated. Similarly, gross return, net return and B:C ratio were calculated on the basis of fresh turmeric cost @ Rs. 15/ .

RESULTS

A total 1152.29 q of fresh turmeric (Table 2) were produced from 7.5 ha area with a productivity of 156.31 q/ha by SHGs under participatory mode. Among the SHGs highest productivity was recorded by Imlang SHG (180.24 q/ha) followed by Pynroilang SHG (179.62 q/ha) and Demkhtop SHG (177.05 q/ha), while lowest productivity was recorded by Honey Dew Multipurpose Cooperative Society (126.50 q/ha). The variation in results may be due to prevailing agro-climatic condition of the location and adoption of recommended scientific management practices by the SHGs.

Table 2. Turmeric yield realization by the different SHGs

	Name of SHGs	Fresh yield (q)	Productivity (q/ha)
1.	Demkhtop SHG	177.05	177.05
2.	Iaiminot SHG	141.5	141.50
3.	HoneyDew Multipurpose Cooperative society	126.5	126.50
4.	Roilang Farmers' Club	140.16	140.16
5.	Pynroilang SHG	89.81	179.62
6.	Symboh Barit SHG VII	78.29	156.58
7.	Kyntiewlang SHG	71.45	142.90
8.	Chriatian Hope Ministry Society	80.12	160.24
9.	Imlang SHG	90.12	180.24
10.	Tiki & Chinthur SHG	82.15	164.30
11.	Melur SHG III	75.14	150.28
Total/ Mean		1152.29	156.31

The results depicted in Table 3 showed that the mean average cost of turmeric cultivation per ha was Rs. 92,856/ha with gross and net return of Rs. 2,34,460/ha and Rs. 1,41,604/ha, respectively. The higher B:C ratio (2.52) was also recorded. The result (Table 3) showed the performance of selected SHGs. Among the SHGs, highest gross return (Rs. 2,70,360/ha), net return (Rs. 1,76,800/ha) and B:C ratio (2.89) was recorded by Imlang SHG followed by Pynroilang SHG (Rs. 2,69,430/ha, Rs. 1,74,054/ha and 2.82, respectively) and Demkhtop SHG (Rs. 2,65,575/ha, Rs. 1,70,600/ha and 2.80, respectively).

The difference in monitory return among the selected SHGs may be due to varied agro-climatic condition prevailing in particular location and adoption of management practices on time by the SHGs. The technological intervention (Megha Turmeric -1 and scientific management practices) helps to achieve higher returns to SHGs. With this success, several farmers from the nearby villages are coming forward for turmeric cultivation. Production of turmeric through participatory mode increased the availability of planting material to SHGs for next year planting. It helped in reduction in the cost incurred on purchase of planting material and ultimately reduced the cost of cultivation. Due to this turmeric cultivation is now a regular profitable enterprise for the SHGs along with other income generation enterprises (e.g. piggery, poultry etc).

Table 3. Returns earned by the SHGs through turmeric cultivation

	Name of SHGs	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
1.	Demkhtop SHG	94975	265575	170600	2.80
2.	Iaiminot SHG	79700	212250	132550	2.66
3.	Honey Dew Multipurpose Cooperative society	83453	189750	106297	2.27
4.	Roilang Farmers' Club	89875	210240	120365	2.34
5.	Pynroilang SHG	95376	269430	174054	2.82
6.	Symboh Barit SHG VII	105694	234870	129176	2.22

7.	Kyntiewlang SHG	81340	214350	133010	2.64
8.	Chriatian Hope Ministry Society	112220	240360	128140	2.14
9.	Imlang SHG	93560	270360	176800	2.89
10.	Tiki & Chinthur SHG	91880	246450	154570	2.68
11.	Melur SHG III	93340	225420	132080	2.42
Mean		92856	234460	141604	2.52

EPILOGUE

Good production practices of Megha Turmeirc-1 as demonstrated in Ri-Bhoi district Meghalaya through farmers' participatory mode during 2009-14 under DBT funded "Establishment of DBTs Rural-Bio resource complex in NE India" project. A total of 622 tribal farmers belonging to 57 self-help groups (SHGs) participated in commercial turmeric production with productivity enhancement from 10 - 12 t/ha to 20 - 22 t/ha with high B:C ratio (2.52). A total 9 SHGs and one individual farmer of Ri-Bhoi district of Meghalaya were engaged in rhizomes production.

In post-harvest management, mechanical drying and powdering units for turmeric have been installed at Laskein in Jaintia Hills. Meghalaya Rural Development Society (MRDS) is providing support to run plant and market the products. The processing capacity of the plant is 300 kg dry or 1500 kg fresh weight turmeric per day. A total of 30 SHGs have been involved as a Federation, who are managing the plant. The Federation is already registered under Society's Registration Act and is also registered with the Department of Industries, Govt. of Meghalaya. The Federation is being managed by women members only. The benefit out of the plant is equitably distributed amongst all the participating SHG members.

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Photographic presentation of turmeric cultivation practices

Plate 1. land preparation by SHGs under supervision of scientist

Plate 2. Planting of Megha Turmeric-1

Plate 3. Healthy turmeric crop

Plate 4. Harvesting of turmeric

Plate 5. Collection of turmeric rhizome

Plate 6. SHGs member showing healthy turmeric rhizome

Plate 7. Weighing of turmeric

Plate 8. Turmeric sold by SHGs