



# Cultivation of Pusa Narangi Variety of Marigold for Crop Diversification and Empowering Farm Women in Malwa Plateau of Madhya Pradesh

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## ABSTRACT

Flower cultivation is a profitable venture for the small and marginal farmers, as the traditional crops are becoming less remunerative. Marigold cultivation in rural areas by farm women suits the most as it requires care and nurturing, picking and packing with care in which the female workers have an edge over the male counterparts. Cultivation of marigold variety Pusa Narangi in Malwa plateau of Madhya Pradesh has successfully demonstrated that this crop can be grown round the year. The variety was introduced in the year 2007 and was assessed through on farm trials, followed by front line demonstrations for three consecutive years. The present study was undertaken to assess the benefits of cultivating Pusa Narangi variety of marigold for crop diversification and boosting the income of farm women exclusively for which they were imparted practical training on the package of practices and marketing strategy. The result showed that round the year cultivation yielded 1.25 t/ ha and giving a net profit Rs 1,17,609/- as against Rs 35,975/- with the local cultivar Saathi. Hence, it can be stated that this was a novel diversification model to economically empower the farm women on sustainable basis.

**Key Words:** Marigold, Participatory Rural Appraisal, Farm Women.

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## INTRODUCTION:

The Government of India has taken several initiatives for Women's Empowerment by passing a policy, much of the rural women's work has not been accounted in official statistics. Women's limited ability to own land and property negatively affects their ability to participate in producer groups, receive income for their labour, and benefit from agricultural services (Ellis *et al*, 2007). The growth in agriculture in the country has been associated with an increase in female employment, a process that is often claimed to enhance women's empowerment. However, empowerment is a contested concept and several studies have highlighted that far from empowering workers, employment can often be precarious, exploitative and harmful.

Madhya Pradesh is the second largest state and ranks seventh in population, located centrally surrounded by the states of Rajasthan to the northwest, Uttar Pradesh to the north, Chhattisgarh

to the east and Maharashtra to the south, and Gujarat to the west. The State is primarily an agriculture State. About 73 per cent population of the state is rural; hence agriculture is the main stay of the state economy. The Agriculture and allied services contributes about 44 per cent share in state economy and 78 per cent of its working force is directly engaged in agriculture. In recent years, greater emphasis has been given to horticultural sector and at present state is producing about 7.69 MMT of horticulture produce from an area of 0.75 M ha. The major share of horticulture produce is from vegetables (48.1%), fruits (43.8%) and only 8.1 per cent from flowers. Flower cultivation in peri urban areas accounts to 9.16 M ha with total production of 7.14 MT and a poor productivity of mere 0.78 MT per ha.

Ujjain district of Madhya Pradesh lies in the Malwa plateau region characterized by low rainfall, recurrent drought with a frequency of one in every four years and three out of five years

receive sub-optimal rainfall i.e. below 890 mm. This poses a serious situation for the farmers particularly the small and marginal farmers whose earnings are not sustainable owing to lack of crop and enterprise diversification. Agriculture can be an important engine of growth and poverty reduction but the sector is underperforming because women, who are often a crucial resource in agriculture and the rural economy, face constraints that reduce their productivity.

To take care of this precarious situation, Krishi Vigyan Kendra took an intervention among the farm women who could exclusively devote their time, energy and land for the cultivation of flowers particularly the marigold which has round the year demand in the holy city of Ujjain for garland and decorative purposes at various kinds of religious and social functions. Keeping this in mind, the study was conducted to know personal and economic characteristics of the farm women, to introduce new variety of marigold- Pusa Narangi and to assess the income generation by adopting this new variety of marigold.

## MATERIALS AND METHODS

### Selection of Village

The cultivation of flowers is predominant in two major blocks of the district Ujjain and Ghatiya; hence they were selected for the present study based on their area and production. Participatory Rural Appraisal (PRA) was used to access the real information of the village and villagers. The farming pattern of the village was assessed in which the cultivators group was categorised in grain, cereal, potato, vegetable and flower cultivator etc. Among them the major group of flower cultivator were approached. The main focus was given on those groups where women either participated or were fully engaged in all the process of cultivation of flowers.

### Package of Practices

Full package of practices were adopted by the target group. The land was ploughed once followed by cross harrowing and planking and the soils were medium black having good water retention capacity. Farm yard manure was incorporated at the rate of 10 t/ha followed by

recommended dose of N: P: K @ 150:80:100 kg/ha. Nursery was raised under raised beds with low tunnel poly-house arrangement. Raised beds were prepared prior to transplanting with a width of 75 cm and plants were transplanted at a spacing of 60 cm followed by 2 to 3 manual weeding to take care of weeds. To facilitate irrigation and promote healthy growth water was applied in furrows. After 45-50 days nipping was done to promote growth of lateral branches and check the apical dominance and get more flower buds per plant.

A well structured questionnaire was prepared for assessing the information and data. The questionnaire was fulfilled through personal interaction of each farm women. The main focus was given on the age group also and the selected group was not more than 45 years. The experiment was conducted by taking two treatments as under:

**Treatment (T1):** In the Malwa region local variety of Marigold -*Saathi* is very popular but from the economic point of view its production was not satisfactory. Hence for replacing the *Saathi* variety, a new variety of marigold was introduced.

**Treatment (T2):** Pusa Narangi variety from IARI was first assessed at farmer's field in the year 2008. This variety was chosen as varietal intervention along with full package of practice and having the following traits such as, attractive price in market due to appealing saffron colour, big size, compact and each petal well shaped, good keeping quality(4-5 days) and high yield as compared to the local variety.

An area of 0.4 ha was chosen for this intervention. Farm women were provided with 150 g seed to raise the nursery. Seedlings of about 35 to 40 d were transplanted on ridges and furrows. Nipping of the plot was done after the initiation of first flower bud to break the apical dominance and promote branching and more bud formation. Regular plant protection measures were adopted till the last picking and the last flush was allowed to mature to form the seed for the successive year. The data recorded on various parameters of growth, flower attribute, yield attributes and flower yield were subjected to statistical analysis (Panse and Sukhatme, 1989).

**RESULTS AND DISCUSSION****Personal profile of farm women**

Personal characteristics and profile of the selected farm women as depicted in the Table 1 gives a clear indication that the age of the farm women varied between 20 yr at the lower level and 45 yr at the upper age limit. Among them maximum farm number of women ( 37.5 %) belonged to age group more than 35 yr whereas only (05) women were of 31 -35 age group category. A total of 35 women were young coming in the age group (20-25 years). Nine women were between 26-30 yr. In case of literacy level, it was evident that in rural areas, still education of women's is neglected phenomenon as in the other part of the country and the same was reflected in the PRA. None of the farm women had even passed high school. Fourty per cent farm women were illiterate and 40 per cent were educated up to primary school. Only 8 women (20 %) had

passed middle school examination.

An important fact which came to the notice was that nuclear family system was growing faster in the rural areas also and not a phenomenon limited to the urban areas exclusively. The data revealed that 25 families (62.5 %) lived in the nuclear family whereas only 15 farm women (17.5 %) belonged to the joint family system. This means that due to certain socio-economic and personal reasons craze of nuclear family pattern was increasing in rural area very drastically. Sixty per cent families had 4-6 family members and only 10 per cent had more than 7 members at home.

**Land holding**

Land holding in the village ranged between 1 to 5 ha/ family. Maximum number (32.5%) of the families had small land holding i.e. 1 to 2 ha and minimum (17.5 %) owned more than 4 ha/family. Hence, the economic condition of the village was

**Table 1. Personal profile of the selected farm women.**

Parameter	No. of Respondents(N=40)	Percentage	Mean + SD	Variance
<b>Age (yr.)</b>				
20-25	14	35.0	30.725	
26-30	09	22.5	±	73.281
31-35	02	05.0	8.56	
35and above	15	37.5	(20 to 45)	
<b>Education</b>				
Not Literate	16	40.0	1.825	3.328
Up to Primary	16	40.0	±	
Middle School	08	20.0	1.824	
High School	00	00.0	(0 to 6)	
College	00	00.0		
<b>Family type</b>				
Nuclear	25	62.5		
Joint	15	37.5		
<b>No. of members</b>				
1-3	12	30.0	±	2.051
4-6	24	60.0	1.432	
>7	04	10.0	(2 to 7)	
<b>Land holding (ha)</b>				
1.0 - 2.0	13	32.5	2.838	
2.0 -3.0	10	25.0	±	1.018
3.0 -4.0	10	25.0	1.009	
4.0 and more	07	17.5	(1 to 5)	
<b>Income of the family (000)</b>				
0.8-1.0	06	15.0	+	0.701
1.0-2.0	18	45.0	0.838	
2.0 and more	16	40.0	(0.8 to 4.0)	

(Figures in the parenthesis indicates the maximum and minimum value)

**Table 2. Growth parameters and yield of marigold variety pusa narangi.**

Treatment	Height (cm)	Branches/Plant	Flowers/Plant	Flower Dia. cm	Yield qt / ha
T1: (Sathi)	68.3	3.678	17.12	3.14	56.49
T2: (Pusa Narangi)	99.448	6.085	28.25	5.36	128.52
Coefficient of Variation	2.99	8.24	3.72	10.83	19.09
CD (0.05)	1.13	0.18	0.38	0.21	7.99

**Table 3. Economics of marigold cultivation.**

Treatment	Cost Of Cultivation (Rs/ha)	Gross Income (Rs/ha)	Net Income (Rs/ha)	Benefit Cost ratio
T1: (Sathi)	18,636	55,053	35,975	2.9
T2: (Pusa Narangi)	23,752	1,41,362	1,17,609	6.0
Coefficient of Variation	9.16	19.58	25.03	
CD (0.05)	878.5	8701.2	8693.9	

also not very satisfactory. The per annum income of the family was 0.8- 4 lac. Maximum number of the family fell in the income range of 1- 2 lac (45 %) while 15 per cent families earned only 0.8 – 1 lac per annum. Hence, it was clear that, the landholding of the villagers was less and hence could be designated under the marginal category. So, in order to boost the economic viability a shift in the existing crop through diversification and introduction of the new crop and variety with reasonable market opportunity was essential keeping in view about the age group and literacy level.

#### Performance of crop and economic outcome

The data (Table 2) indicated that the existing local cultivar *Saathi* was out performed by the variety Pusa narangi in all the crop growth parameters. The improved variety was significantly taller than the local by more than 31 cm. Similarly, T2 had significantly more number of branches thus giving more floral buds and flowers per plant. Both these parameters were higher over T1 by 65 per cent. Data further revealed that the yield of T2 varied significantly and was higher by 126 per cent. This was probably due to the scientific package of practice followed in T2 along with prolonged duration of flowering spread over 90 d as against on 45 to 60 d in the local cultivar. Besides this, T2 was found suitable for growing in this agro-climate for almost nine months in succession except the period from April to June when the irrigation facilities are limited in

this part of the malwa plateau. The above findings were in line with the findings of Yadav *et al* (2000) and Kumar *et al* (2009).

Table 3 depicted the cost involved in the cultivation of both the cultivars which vary significantly because of the fact that the farmers grow the local cultivar with least input in terms of manure and fertilizer. Further this variety is restricted in its growing period from August to October, so the tendency of the farmer is to grow it with least input, harvest it around the *Diwali* festival and make some money. After that period they had no alternative for marigold. T2 variety has given an almost round the year option for the farmers and farm women for the most demanded flower in this region. The cost of cultivation per quintal of T2 was Rs 184/- as against Rs 329/- under T1. The initial cost in terms of input in T2 may seem to be higher but the total net return as a result of higher yield leads to a benefit cost ratio of 6.0 as against only 2.9 in T1. Larger sized flower as depicted in table 2 also fetched handsome price in the market as compared to T1 and hence was more viable, economical and an alternative to higher income to the family in a staggered manner on a continuous basis.

#### CONCLUSION

It can be concluded that all category of farmers particularly farm women if devote a small piece of land to flower cultivation, round the year the net income of the family can be increased many folds. Higher B:C ratio suggested that the

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enterprise was viable and the continuous demonstrations of farmers field suggested that the yields were sustainable and sufficient to meet the price fluctuations when averaged over longer period of time in a year, particularly if the crop was grown in succession for more than nine months.

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