

Proceedings:

International Conference on
Mango and Date Palm: Culture and Export.
20th to 23rd June, 2005.
Malik *et al.* (Eds), University of Agriculture, Faisalabad.

EVALUATION OF SOME MANGO CULTIVARS UNDER NORTH INDIAN CONDITIONS

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ABSTRACT

Five mango cultivars viz. Dashehari, Langra, Mallika, Amrapali and Alphanso were introduced at PAU, Regional Fruit Research Station, Abohar during the year 1982-83. These cultivars are being evaluated for their vegetative as well as fruiting behaviour. The plants of cultivar Langra have been observed to be vigorous while, Mallika, Dashehari and Amrapali closely followed each other whereas, the trees of Alphanso showed less vegetative growth. Maximum fruit yield (73.00 kg/tree) was recorded in the plants of Mallika which was closely followed by Dashehari while it was the minimum in Amrapali. Highest total soluble solids (20.04%) were recorded in the fruits of Dashehari which was closely followed by Langra, Amrapali and Mallika. The cultivars Dashehari and Langra matures during second week of July while, Mallika and Amrapali matures during the third week of July. The incidence of mango hopper was the highest in Mallika while, it was the lowest in Dashehari. The highest incidence of mango malformation was recorded in Mallika and lowest in Langra. Powdery mildew incidence was the highest in Amrapali followed by Alphanso, Dashehari and Langra whereas, its incidence was the least in Mallika. On the basis of fruit yield and quality attributes, the cultivation of Dashehari, Langra, Mallika and Amrapali is recommended for commercial cultivation in the south-western districts of Punjab.

INTRODUCTION

Mango (*Mangifera indica* L.), the king fruits, is the most important fruit in the tropical as well as sub-tropical regions of the world in which, India contributes a major share in area and production (Chadha, 1989). It is undoubtedly, one of the choicest fruits known to mankind in India. Most of the existing varieties of mango in India are selections from the seedlings. However, during the last decade, quite a good number of mango hybrids have been released having improvement over the existing varieties. In Punjab, mango is being cultivated in the sub-mountainous region comprising of Hoshiarpur, Gurdaspur, Amritsar, Patiala and Ropar. At present, the area under mango plantation in the State of Punjab is estimated to be 6040 hectares with a production of 60400 tones (Anonymous, 2002). In arid zone i.e. South-Western districts of Punjab, citrus fruits are predominantly being grown. On account of cultivation of citrus fruits especially Kinnow, the area is known as California of Punjab. The arid zone has negligible area under mango plantation. Due to the change in agro-climatic conditions, need of diversification in

fruit crops and to avoid monoculture, efforts were made to establish and popularize the cultivation of mango in the south-western districts of Punjab.

MATERIALS AND METHODS

The present studies were conducted to evaluate the performance of mango cultivars under arid-irrigated region of Punjab, at Regional Fruit Research Station, Abohar, located in the state of Punjab (Latitude 74.12 °E, 30.08 °N with an altitude 185.78 meter; annual precipitation 75-300 mm). Five mango cultivars, viz., Dashehari, Langra, Mallika, Amrapali and Alphanso were introduced from the mango growing regions of the country for establishment and their evaluation. The plants were planted at a distance of 9 m x 9 m and uniform cultural operations were given. The performance of each cultivar was studied in terms of vegetative growth, flowering and fruiting behaviour, fruit yield, physico-chemical parameters and susceptibility to insect-pests and diseases.

RESULTS AND DISCUSSION

Vegetative growth

It is evident from the data presented in Table 1 that the cultivar Langra had the maximum vegetative growth followed by Mallika. Tree height and spread have been observed to maximum in Langra with significant differences over other cultivars. Tree volume was the maximum (311.38 m³/tree) in Langra which was closely followed by Mallika while, it was the minimum (58.49 m³/tree) in Alphanso. Similar findings have also been reported by Singh and Chadha, (1981), Majumdar et al. (1982), Shrivastava et al. (1987) while evaluating the mango varieties in India.

Flowering and Fruiting behaviour

It was observed that flowering in cv. Dashehari was observed to be earliest (last week of February) followed by Amrapali and Mallika (first week of March), while, Langra and Alphanso were the last to come into flowering (second week of March). It is evident from the data presented in Table 2 that fruit yield was maximum (73.00 kg/tree) in cv Mallika followed by Dashehari (66.33 kg/tree) while, other cultivars Langra and Amrapali recorded the fruit yield of 62.00 kg/tree and 45.67 kg/tree, on the other hand minimum fruit yield (15.67 kg/tree) was recorded in Alphanso.

Physico-chemical characters

The data presented in Table 3 & 4 revealed that maximum fruit weight (357.44 g/fruit) and size (length 13.09 cm and breadth 7.63 cm) was recorded in cv Mallika, while, Alphanso recorded minimum fruit weight (201.67 g/fruit) and size (length 9.33 cm and breadth 6.13 cm). The fruits of Langra, Dashehari and Amrapali followed each other in descending order in average fruit weight, fruit size and pulp content with nominal differences. Pulp content was the maximum (71.66 %) in Langra while, it was minimum (64.80 %) in Amrapali. Highest TSS (20.04 %) was recorded in the fruits of Dashehari which was closely followed by those of Langra, Amrapali and Mallika whereas, it was the minimum (17.50 %) in Alphanso. The acid content was minimum in Dashehari followed by Langra and maximum in Alphanso. Reducing sugars were the maximum (3.95 %) in Langra while minimum in Mallika (3.00). Variation in growth, fruit yield and physico-chemical characters have been reported due to change in climatic factors or inherent genetic reasons (Singh and Chadha, 1981; Majumdar et al., 1982 and Shrivastava et al., 1987). The cultivars Dashehari and Langra matures during second week of July while, Mallika and Amrapali matures during the third week of July while, Alphanso was the late in maturity (fourth week of July).

Insect-Pests

The data presented in Table 5 revealed that mango cultivars varied in degree of susceptibility to insect-pests like mango hopper, mealy bug and scales. It was observed that mean population of mango hopper was highest (4.1 hoppers/panicle) on Mallika whereas it was

minimum (2.4 hoppers/twig) on Dashehari. On all the five cultivars, population of mealy bug ranged from 2.7 to 4.0 bugs/twig. The mean population of scales ranged from 9.7 scales/leaf in Alphonso to 31.8 scales/leaf in Langra. Infestation by shoot borer and stem borer was not observed.

Diseases

It is evident from the data presented in Table 5 that susceptibility of various cultivars to different diseases varied from variety to variety. All the varieties showed 7.9 to 9.6 % incidence of anthracnose. The highest incidence of anthracnose was recorded in Langra (9.6 %) whereas, it was the lowest (7.9 %) in Dashehari. Incidence of mango malformation was the highest in Mallika (47.5 %) and lowest in Langra (22.9 %). Powdery mildew incidence was the highest (37.10 %) in Amrapali followed by Alphonso (34.3 %) and Dashehari (33.90 %) whereas, its incidence was least (31.20 %) in Mallika. Therefore it was observed that all the cultivars received no serious threat from any of the major insect-pests and diseases.

All the five cultivars have been observed to be dominated with pleasing aroma and sweetness which probably was due to higher sugar/acid ratio. Hence, on the basis of fruit yield and quality attributes, the commercial cultivation of Dashehari, Langra, Mallika and Amrapali can be done successfully in the south-western districts of Punjab.

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TABLES

Table 1: Vegetative growth of various mango cultivars

Cultivar	Height (m)	Tree Spread (cm)		Tree Volume (m ³)
		East West	North-South	
Dashehari	6.34	7.36	7.77	186.33
Langra	6.62	9.66	8.97	311.38
Mallika	6.51	8.17	8.15	231.44
Amrapali	6.03	6.63	6.67	134.93
Alphanso	3.90	5.06	4.93	58.49
CD at 5%	0.93	1.27	1.66	57.18

Table 2: Flowering period and fruit yield of various mango cultivars

Cultivar	Flowering Period	Fruit yield (Kg/tree)
Dashehari	Last week of February	66.33
Langra	Second week of March	62.00
Mallika	First week of March	73.00
Amrapali	First week of March	45.67
Alphanso	Second week of March	15.67
CD at 5%	--	8.15

Table 3: Physico-chemical characters of mango cultivars

Cultivar	Fruit Weight (g)	Fruit Size (cm)		Pulp (%)	TSS (%)	Acidity (%)
		Length	Breadth			
Dashehari	223.67	11.13	6.33	66.31	20.36	0.24
Langra	256.44	10.92	6.55	71.66	20.00	0.21
Mallika	357.44	13.09	7.63	70.75	19.22	0.34
Amrapali	216.87	11.11	6.07	64.80	19.49	0.34
Alphanso	201.67	9.33	6.13	65.19	17.50	0.36
CD at 5%	60.99	1.21	0.76	2.34	1.66	0.05

Table 4: Physico-chemical characters of mango cultivars

Cultivar	Reducing Sugars (%)	Pulp/Stone ratio	Maturity period
Dashehari	2.84	6.21	2 nd week of July
Langra	3.11	7.45	2 nd week of July
Mallika	2.76	7.40	3 rd week of July
Amrapali	2.92	5.40	3 rd week of July
Alphanso	2.63	5.47	Last week of July
CD at 5%	0.23	1.08	--

Table 5: Susceptibility of mango cultivars to various diseases and insect-pests

Cultivar	Percent Disease Incidence			Incidence of insect-pests		
	Mango malformation	Powdery mildew	Anthracnose	Mango hopper/panicle	Mealy bug/twig	Scale/leaf
Dashehari	35.0	43.90	7.9	2.4	2.7	19.7
Langra	22.9	37.10	9.6	3.1	4.0	31.8
Mallika	47.5	35.30	8.5	4.1	3.4	22.1
Amrapali	35.3	45.60	8.1	2.6	3.4	18.9
Alphanso	36.8	35.20	8.1	2.5	2.8	9.7
CD at 5%	5.8	NS	NS	0.9	NS	11.2