



ORIGINAL RESEARCH PAPER

Agricultural Science

YIELD PERFORMANCE OF MANGO (*MANGIFERA INDICA* L.) GENOTYPES UNDER THE CONDITION OF THENI

KEY WORDS: Mango, Panicle, Fruiting characters, Harvest, Yield.

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ABSTRACT
 An investigation was carried out to evaluate the different genotypes of mango for their yield performance under theni condition. The experiment with Ten mango genotypes were laid out in a randomized block design. The experiment revealed that the number of flowers per panicle was maximum in Pedharasam (1346.80) while it was minimum in Banganapalli (741.40). The highest percentage of fruit set was registered in Banganapalli (0.74 %), where as it was the lowest in Malpacharisi (0.12%). Maximum fruit retention percentage was recorded in Sendhuram (38.46%) while minimum was registered in Banganapalli (12.20%). The highest fruit drop percentage was observed in Banganapalli (87.80 %) followed by P.K.Patti (87.04%), while it was minimum in Malpacharisi (60 %). In most of the cultivars, the date of harvesting ranged from 3rd to 4th week of June. The maximum yield per tree to the tune of 59.67 Kg was recorded in Ratna. The minimum yield per tree (1.15 Kg per tree) was recorded in kuruvi Neelum.

INTRODUCTION

Mango (*Mangifera indica* L.) is the most important commercial fruit crop of the tropical and subtropical regions of the world. It is considered as the “king of fruits” due to its excellent flavour, beautiful colour, attractive fragrance and delicious taste. Mango belongs to the genus *Mangifera*, family Anacardiaceae and order Sapindales. The edible species *Mangifera indica* L. bears good quality fruits and is commonly referred to as cultivated mango. The other edible *Mangifera* species generally have lower quality fruits and are commonly referred to as wild mangos. It originated in the Indo-Burma region during the earlier period of the Cretaceous era (Yonemori *et al.*, 2002). It gradually spread and become naturalized and adapted throughout the tropics and subtropics and has been grown commercially for centuries. Today, mangos are recognized and eaten throughout the world and are regarded as one of the most popular and esteemed tropical fruits. Mango is diploid with 2n=40 having a genome of 8.8 × 10⁸ bp. phenomenon of allopolyploidy, out breeding, and the different agro-climatic conditions in mango growing areas, has resulted in a high level of genetic diversity in mangos (Krishna and Singh, 2007). Mango has rich intra-specific diversity and there are about 1600 cultivars in the world (Pandey, 1998), of which some 350 cultivars are in commercial production and the rest are limited to mixed orchards or home gardens. India is thought to be the primary centre of diversity for mango (NBPGR, 2007). It is a major fruit crop of India and occupies an area of 2.263 million hectares with an annual production of 19.68 million tonnes and the productivity is 8.71 MT/hac. The export potential of india is 52761 MT of fresh and dried products of mango with the benefit cost of Rs.44,366 Lacs.(APEDA, 2016-17) The area, production and productivity of mango in TamilNadu is 160.49 thousand hac, 1.157 million tonnes and 7.19 MT/hac (India stat 2016-17). Different cultivars of mango varied in their performance and these differences are governed by various genetic, cultural and environmental factors. Due to the

variation in performance of different mango cultivars, the suitability of these cultivars from the consumers point of view are often evaluated from different angles. The study of yield is pomologically important external and internal characteristics of the fruit in mango cultivars are required to provide the important criteria for the evaluation of such cultivars. The main objectives of this research work were to economically characterize and evaluate the fruit characteristics and to identify the genetic diversity at economic level. Evaluation of different promising mango cultivars for a given set of ecology is one of the pre requisite for successful mango cultivation. Therefore, it becomes imperative to study the yield performance of different mango (*Mangifera indica* L.) genotypes under Periyakulam region of TamilNadu.

MATERIALS AND METHODS

The uniformly growing 10 years old trees of ten mango genotypes viz., P.K.Patti, Arka Aruna, Kuruvi Neelum, Pedharasam, Duraipandi, Ratna, Langra, Banganapalli, Sendhuram, and Malpacharisi were evaluated at Horticultural college and Research Institute, Periyakulam of TamilNadu Agricultural University - TamilNadu, during 2017-18 employing randomized block design with three replications as single tree is considered as one replication. All the plants selected for experiments were almost uniform in growth and vigour and maintained under uniform cultural practices. Fully grown 3 trees of each genotype were selected which received uniform cultural operations as per package and practices for fruit crops during the course of study. The blooming period for each genotype was recorded regularly from the tagged panicles and duration of flowering was calculated. The average number of panicles/plant was counted manually on each plant. The number of flowers/panicle and number of fruits/panicle were recorded from already tagged shoots. The average number of fruits/plant was recorded at the time of harvesting from the marked plants. Per cent fruit set, fruit

retention and fruit drop were calculated by the following formula:

$$\text{Fruit set \%} = \frac{\text{Number of fruits}}{\text{Total number of flowers}} \times 100$$

$$\text{Fruit retention \%} = \frac{\text{Number of fruits per panicle at harvest}}{\text{Number of initial fruit set}} \times 100$$

$$\text{Fruit drop \%} = \frac{\text{Number of initial fruit set} - \text{Number of fruits per panicle at harvest}}{\text{Number of initial fruit set}} \times 100$$

The date of fruit harvesting was recorded when the fruit attained maximum size and maturity. The total number of fruits per tree in each replication was recorded. The fruit yield of the tree was recorded and expressed in kgs/plant. based on randomized block design (RBD) the data on different parameters were analysed by using Statistical Package for Agricultural Workers (STAT OP Sheoran). Numbers of replications per treatment for observing different traits pertaining to flowering and fruiting characteristics are mentioned in respective sections. Valid conclusions were drawn only on significant differences between the treatment mean at 0.05 level of probability. In order to compare treatment means, critical differences were calculated.

RESULTS AND DISCUSSION

The study revealed that the genotype Arka Aruna and Sendhuram were the earliest to flower among the genotypes selected for the present study. In most of the mango genotypes, 3rd week of February was found to be the peak period for flower initiation. Srivastava et al. (1987) and Simao et al. (1996) also observed similar trend of flower initiation in different mango cultivars. Arka Aruna and Sendhuram were the first to come into full bloom, while Kuruvi Neelum and Duraipandi were the last. In general, cultivars which showed early flower initiation also showed early full bloom and fruit set but they did not necessarily ripen in the same sequence suggesting thereby that no definite trend existed between flowering and ripening. Hoda et al. (2003) also reported similar observations in mango. Arka Aruna and Sendhuram were the first to show the completion of flowering. The significant variations were recorded among the mango genotypes with respect to the duration of flowering. Kuruvi Neelum and Banganapalli was found to be the shortest duration (15 days), while highest duration of flowering was recorded in Pedharasam (53 days). These results were in line with the finding of Bose et al. (2001) who stated that the duration of flowering in mango was usually of 2-3 weeks, which may be extended under low temperature and shortened under high temperature.

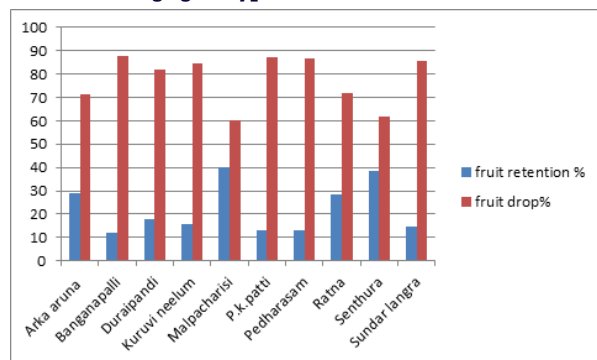
The number of flowers per panicle showed a considerable variation among different mango cultivars. Maximum number of flowers per panicle was recorded in Pedharasam (1346.80), while the minimum number of flowers was recorded in Banganapalli (741.40). These findings are in consonance with Parshant Bakshi et al. (2012). The total number of flowers in the

panicle may vary from 1000 to 6000 depending upon the variety (Mukherjee, 1953). A significant variation was recorded among the mango cultivars with respect to the number of fruits per panicle. The maximum number of fruits harvested per panicle (2.00) followed by Ratna (1.73) was recorded in Sendhuram. The minimum number of fruits per panicle were observed in kuruvi Neelum (0.33) followed by P.K.Patti (0.47), and Langra (0.47). These findings are in agreement with those of Iyer and Degani (1997). Among the 10 mango Genotypes, Ratna recorded the maximum number of fruits per tree (252) followed by Sendhuram (248). Lowest number of fruits per tree was recorded in Kuruvi neelum (8) and P.K.Patti (14). A considerable variation with regard to per cent fruit set was observed among different cultivars (Table 1). The maximum fruit set percentage was registered in Banganapalli (0.74%), whereas it was minimum in Malpacharisi (0.12%). These findings are in consonance with Kishore et al. (2015). These differences may be ascribed to the difference in the agro-climatic conditions and the cultivars under study as fruit set is a varietal character, depending upon the several factors such as time of flowering, sex ratio, efficient cross pollination, and intensity of fruit drop. Genotypes differ from one another in these respects and this leads to varying fruit set in different genotypes (Singh, 1996). In mango, there is a heavy drop of hermaphrodite flowers and young fruits, amounting to 99% or more (Mukherjee, 1949). This observation emphasized the nature of heavy fruit drop in mango. The maximum drop of fruits in Banganapalli and P.K.Patti took place in the first 3 weeks of April and differed significantly from the drops in the following weeks. Fruit drop was to some extent associated with the variety as the variety Banganapalli was more prone to fruit drop than P.K.Patti. The highest fruit drop percentage was observed in Banganapalli (87.80%) followed by P.K.Patti (87.04%), while it was minimum in Malpacharisi (60%). These findings are accordance with Bakshi et al. (2012) noted maximum per cent fruit drop in Rajiv followed by Varun, while WeiHong et al. (2001) reported highest fruit drop in Mallika and Amrapali in China. Maximum fruit retention percentage was recorded in Sendhuramm (38.46%) while minimum was registered in Banganapalli (12.20%) which is represented in Fig 1. These results are accordance with Chauhan (1972). The pattern of fruitlet abscission is asymptomatic with the greatest loss occurring during the first weeks after anthesis (Nunez-Elisea and Davenport, 1983; Searle et al., 1995). In most of the cultivars, the date of harvesting was in the 4th week of June. The maximum yield per tree to the tune of 59.67 kg was recorded in Ratna. The cultivar Sendhuram with yield of 51.19 kg was found next in order. The minimum yield 1.15kg per tree was recorded in Kuruvi Neelum. These findings are accordance with Singh et al. (2011). These differences in yield per tree in various cultivars of mango might be ascribed to the differences in agro climate conditions in different location and the cultivars under study. The variation in fruit yield per tree could be because of variable fruit size and weight of different Genotypes studied.

Table 1. Flowering and fruiting behaviour of different mango genotypes

Genotypes	Total.No. of Flowers Per Panicle	Duration of Flowering	Fruit Set Percentage	No. of Fruits Harvested Per Panicle	No. of Fruits Harvested Per Tree	Yield Per Tree
Arka Aruna	843.87	39	0.60	1.47	138.3	34.11
Banganapalli	741.40	15	0.74	0.67	66.23	18.92
Duraipandi	1086.27	17	0.31	0.60	25.67	7.15
Kuruvi Neelum	799.27	15	0.27	0.33	8.22	1.15
Malpacharisi	1098.87	43	0.12	0.53	28.08	37.52
P.K.Patti	1059.87	37	0.34	0.47	14.24	28.05
Pedharasam	1346.80	53	0.30	0.53	62.48	10.33
Ratna	1334.47	32	0.46	1.73	252.03	59.67
Sendhuram	1034.87	35	0.50	2.00	248.06	51.19
Sundar Langra	1187.40	19	0.27	0.47	35.26	7.84
Mean	1053.31	30.50	0.39	0.88	87.86	25.59
SE.d	25.52	0.55	0.01	0.02	2.15	0.47
CD at 5%	54.02	1.17	0.02	0.04	4.55	0.98

Figure 1. Fruit retention and fruit drop percentage of different mango genotypes



CONCLUSION

It is thus concluded that out of all the ten genotypes grown under periyakulam conditions of TamilNadu, genotype Ratna showed better performance as it resulted in maximum fruit yield with 71.74% of fruit drop, while highest fruit set percentage was recorded in Banganapalli.

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