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Performance of certain mango varieties and hybrids under high density planting in Krishna district of Andhra Pradesh

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Abstract

Studies were conducted at farmers field in Putrela village, Krishna District, Andhra Pradesh from 2010 to 2013 on 10 years old mango garden having cultivars like Baneshan, Totapuri, Suvermarekha, Alphonso, Cherukuram and hybrids like Mallika and Neeleshan planted at a closer spacing of 7.5 x 7.5 m to evaluate their performance under high density planting. Pooled analysis of four years data revealed that Baneshan recorded maximum tree height (7.1 m), tree spread in E-W (7.29 m) and N-S directions (7.23 m). Neeleshan recorded highest number of fruits/tree (205.76) whereas Mallika recorded maximum fruit weight of 390.31g. The maximum yield of 66.76 kg/tree was recorded by Totapuri. Mallika was found to be the sweetest with highest TSS of 15.35 °B. During early productive phase it can be concluded that among varieties Totapuri was found to perform better than the rest of the varieties and among the two hybrids Neeleshan was found to perform better under high density planting systems for better productivity.

Keywords: Performance, certain mango varieties, hybrids under high density planting

Introduction

Mango is the second important fruit crop of India after banana which is often referred as “King of Fruits” occupying an area of 2516 thousand hectares resulting in production of 18431 thousand MT and its share in total fruit production is 20.7% (Anonymous, 2014). Andhra Pradesh alone has highest area of 4, 80, 400 hectare and production 40, 58, 300 MT but with a less productivity of 8.4 mt/ha. The highest productivity of 13.0 mt/ha was in Uttar Pradesh (Anonymous, 2010) [1]. Reasons for low productivity in Andhra Pradesh may be due to high spacing, lack of improved varieties and suitable package of practices for better yields. Most of the orchards in and around Krishna district are of seedling types comprising of few varieties like baneshan, local types referred as “Natu”, juicy types like “Rasalu” and pickle types planted at very high spacing accommodating not more than 40 – 65 plants/acre thereby getting low yields and low productivity. Due to the high spacing between plants the tree height and spread is more making routine field operations like spraying, pruning and harvesting labour intensive leading to ineffective spraying, pruning and making harvest a difficult task. Improperly harvested fruits are having poor shelf life leading to post harvest losses. Planting mango at closer spacing helps to accommodate more number of plants per unit area, controlling plant canopy spread by regular pruning from the initial stage of garden establishment. Under reduced tree canopy conditions the regular field operations like spraying, pruning and harvesting can be done easily resulting in better quality fruits and increased productivity. In order to boost the mango production and productivity in the state through horizontal and vertical area expansion, suitable cultivars are required and there is every need to assess the performance of different mango cultivars and hybrids as they require specific climate for their best performance. Moreover, the detailed performance of various cultivars under closer spacing is lacking. Therefore, the present study was taken up to increase the production and productivity of mango orchards in Andhra Pradesh.

Materials and Methods

Studies were conducted on ten years old mango varieties and hybrids during 2009-10, 2010-11, 2011-12 and 2012-13 at farmer’s field in Putrela village, Krishna District. The research site is situated at an altitude of 73 m above mean sea level between 16° 57' 0" North, 80° 47' 0"

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East latitude and 85°40' E longitude. The climate of the location is tropical, hot and humid. The soils are red and red sandy. The soils are highly fertile resulting in more vegetative growth. Hence the spacing of 7.5 x 7.5 m was considered as high density planting. The experiment was laid out in RBD with three replications in each variety / hybrid. The trees in the orchard were maintained by following uniform cultural practices during the entire experimental period. Pruning practices for high density planting was strictly followed during the entire experimental period. Five mango varieties (Baneshan, Totapuri, Suvernarekha, Alphonso and Cherukurasam) and two mango hybrids (Mallika and Neeleshan) were evaluated and data on various growth parameters like tree height, tree spread in terms of East – West and North – South directions, reproductive characters like number of fruits per tree, fruit weight, yield per tree and chemical characters like total soluble sugars were recorded. TSS was recorded using hand refractometer. The data collected was analyzed statistically by following Panse and Sukhatme (1961).

Results and Discussion

Pooled analysis from four years data recorded significantly highest tree height of 7.1 m, tree spread of 5.17 m (E-W) and trees spread of 7.23 m (N-S) in Baneshan. Significantly highest number of fruits per tree was recorded in Neeleshan

(205.76) followed by Totapuri (195.64) and Alphonso (140.64) which were on par with each other. Similar results were reported by Rao and Rao (2007) [6]. Maximum fruit weight of 390.31 g was recorded in Mallika followed by Totapuri (322.91 g) and Baneshan (297.02) which were on par with each other. Similar results were reported by Gunjate *et al.*, (2009) [4] and Das (2013) [3]. Significantly highest yield per tree was recorded in Totapuri (66.76 kg/tree) followed by Neeleshan (54.46 kg/tree) and Alphonso (42.33 kg/tree) which were on par with each other. Slight variations in data as compared to other references like variability in fruit size and weight of different varieties may be attributed to genotypic and environment factors and their interaction effects. Mallika is the sweetest which recorded significantly highest TSS of 15.35 °B followed by Alphonso with 14.16 °B which were on par with each other. Similar results were reported by Das (2013) [3]. Among varieties Totapuri and among hybrids Neeleshan is the best performer under closer spacings. Similar results were reported by Rao and Rao (2007) [6]. (Table 1). Growth of mango is genetically controlled and environmental conditions play a major role in the differences of growth pattern under different agro-climatic conditions. Yield is a highly variable character and is observed to be dependent on variety, age of the plants, flowering duration, climatic conditions and pest disease incidence. Hence there are slight variations in the data as compared to reference data.

Table 1: Performance of certain mango varieties and hybrids under high density planting Pooled Analysis (2010 – 2013)

Variety/Hybrid	Tree Height (m)	Tree Spread (E-W) (m)	Tree Spread (N-S) (m)	No. of Fruits/tree	Fruit Weight (g)	Yield (kg/tree)	TSS (°B)
Baneshan	7.1	7.29	7.23	86.57	297.02	29.81	11.19
Totapuri	5.9	6.45	6.51	195.64	322.91	66.76	10.19
Suvernarekha	5.1	5.23	5.31	98.61	212.02	24.75	10.57
Alphonso	5.6	5.54	5.93	140.64	260.52	42.33	14.16
Mallika	5.6	5.82	5.69	100.05	390.31	36.97	15.35
Neeleshan	5.9	6.19	5.79	205.76	251.19	54.46	10.38
Cherukurasam	5.2	5.17	4.98	95.94	239.58	26.43	9.66
SEM ±	0.21	0.26	0.26	29.03	38.98	9.47	0.58
CD	0.62	0.77	0.77	86.25	NS	28.14	1.74

Conclusion

It can be concluded that among varieties Totapuri and among hybrids Neeleshan is the best performer under closer spacing of 7.5 x 7.5 m in Krishna district conditions of Andhra Pradesh.

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