

Performance of Acid Lime Varieties for Hasta Bahar under Akola Conditions

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Abstract

Eight varieties of acid lime viz., V1-Chakradhar, V2-Pramalini, V3-Vikram, V4-Tenali, V5-Sai-Sharbati, V6-Kagzi Lime, V7-MangaliPattu, V8-PDKV lime grown at "All India Co-ordinated Research Project on Tropical Fruits (Citrus) Dr. PDKV, Akola were studied for growth, yield and quality parameters. Statistical analysis indicated that variety PDKV lime had given best performance in respect yield and quality parameter followed by Sai-Sharbati and poor performance was resulted in Mangali Pattu during hasta bahar 2011-2012.

Keywords: Acid lime; Hasta bahar varieties

Introduction

Acid lime (*Citrus aurantifolia* Swingle) is sub-tropical fruit crop. Acid lime flowers thrice in a year, that is in the month of Jan- Feb, June-July and Sep- Oct in Akola condition and generally known as Ambia, Mrig and Hasta bahar resp. Acid lime fruits have great medicinal value being acidic. Lime is appetizer, stomachic, antiscorbutic, antihelmintic and it checks biliousness [1]. Area under this crop is increasing day-by-day and gaining importance in the citrus industry [2]. As it does well in Vidarbha region of Maharashtra state were some of commercially important varieties of Acid lime are grown. Hasta bahar flowering is observed in September-October month and is initiated after completion of rainy season and starting of winter i.e. in October.

The fruit of hasta bahar are ready for harvesting at April-May the price of hasta bahar fruits are 6 to 8 times more than ambiabahar and 3 to 4 times than mrigbahar. So, it is beneficial to cultivar in Akola region. Various varieties have good performance for hasta bahar. But it essential to study performance of acid lime varieties for hasta bahar under Akola conditions.

Material and Methods

The present studies were carried out on fifteen years old acid lime orchard during the year 2011-12 at All India Co-ordinated Research Project on Tropical Fruits (Citrus), Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. Material used and methods adopted during the course of investigations were outlined in this chapter. Eight varieties of acid lime viz., V1-Chakradhar, V2-Pramalini, V3-Vikram, V4-Tenali, V5-Sai-Sharbati, V6-Kagzi Lime, V7-MangaliPattu, V8-PDKV lime were planted during 1996 in square system at 6 × 6 m and recommended package of practices are followed for establishment of orchard. Irrigation was given as per requirement. The experiment was framed in randomized block design with three replications having two plants as treatment unit. Observation were recorded on growth (height, spread and volume of plant), yield per plant per hacter and

quality parameter viz., diameter of fruit, rind thickness, juice percentage, number of seeds per fruit, TSS, acidity, ascorbic acid were statistically analyzed. The fruit on each harvesting of tree of each variety were weighed and per tree fruit yield was recorded. The harvesting was carried out during March-April 2012.

Result and Discussion

Growth parameter

It is revealed from the data presented in Table 1 that different varieties of acid lime had exhibited significant differences in plant height, spread and plant volume. The highest height of the plant was recorded in PDKV lime (4.01 m), followed by Pramalini (3.73 m). While, Mangali-Pattu recorded the lowest height of plant (2.93 m). In respect to plant spread in hasta bahar the maximum plant spread was recorded in PDKV lime (30.82 m²) followed by Vikram (28.96 m²) and minimum in Mangali-Pattu (20.68 m²). However, significantly highest plant volume was observed for variety PDKV lime (53.90 m³) whereas the Mangali-Pattu recorded the lowest tree volume (27.06 m³).

Flowering

Significantly highest fruit set percentage was recorded in PDKV lime (31.00%) followed by Kagzi lime (28.33%) and minimum fruit set Chakradhar (24.00).

Fruit yield

The significant differences were observed among the varieties for this trait. Significantly highest number of fruit was recorded for PDKV lime (1126.67) followed by Vikram (968.67). The lowest no. of fruits per plant was recorded for Mangali- Pattu (502.67) for hasta bahar. Similar trends were observed by Ingle et al. [3]. Significantly highest fruit yield was observed in PDKV lime (29.73 kg/plant) followed by Kagzi lime (25.17 kg/plant). While the lowest fruit yield per tree was found in Mangali- Pattu (16.00 kg/plant).

Varieties	Plant height (m)	Plant spread (m ²)	Plant volume (m ³)	Fruit set (%)	Fruits per plant	Yield per plant (kg)	No. of seeds per fruit	Fruit diameter (cm)	Juice content (%)	Peel thickness (mm)	TSS (°Brix)	Acidity (%)	Ascorbic acid (mg/100 ml juice)
V1	3.41	28.61	43.70	24.00 (29.33)	684.33	19.57	1.67	3.40	47.00 (43.28)	1.60	7.64	8.23 (2.87)	29.10
V2	3.73	23.82	37.34	25.33 (30.22)	749.67	22.44	11.67	3.52	48.20 (43.97)	1.50	7.83	7.97 (2.82)	29.13
V3	3.63	28.96	46.55	27.67 (31.73)	968.67	25.00	8.67	3.50	47.40 (43.51)	1.77	7.67	7.53 (2.74)	28.17
V4	3.13	21.40	29.46	26.80 (31.18)	607.67	20.52	8.33	3.68	41.67 (40.20)	1.30	7.40	7.40 (2.72)	27.45
V5	3.56	22.00	32.46	27.87 (31.86)	712.00	24.20	7.67	3.80	47.67 (43.66)	1.55	7.50	7.13 (2.67)	28.19
V6	3.56	27.08	42.50	28.33 (32.16)	910.00	25.17	12.33	3.66	43.73 (41.40)	1.36	7.46	7.60 (2.76)	28.53
V7	2.93	20.68	27.06	27.63 (31.71)	502.67	16.00	14.67	3.78	43.53 (41.28)	1.53	7.60	8.10 (2.85)	27.17
V8	4.01	30.82	53.90	31.00 (33.83)	1126.67	29.73	9.67	3.99	50.33 (45.19)	1.16	7.73	7.53 (2.74)	30.33
SE (m) +	0.10	1.43	0.61	0.26	4.48	0.77	0.64	0.10	0.88	0.06	0.06	0.11	0.27
CD at 5%	0.31	4.32	1.84	0.79	13.55	2.33	1.93	0.31	2.67	0.18	0.19	0.34	0.81

Table 1: Performance of different varieties of acid lime for hasta bahar under Akola conditions for growth, yield, quality and biochemical attributes.

Quality attributes

Lowest number of seeds was observed in Chakradhar (1.67) and the highest number of seeds was recorded in Mangali-Pattu (14.67). Similar results were also reported by Bagde and Patil [4]. They studied the difference between the Chakradhar and kagzi lime variety and found that the fruits of Chakradhar were with minimum (1.5) number of seeds per fruit. It was also found that the maximum number of seeds per fruit in Pramalini (9.02) followed by Vikram (7.12)

Diameter of fruit was varied significantly among the varieties of acid lime. The PDKV lime (3.99 cm) recorded significantly maximum diameter of fruit followed Sai Sarbati (3.80 cm) whereas minimum diameter was observed in Chakradhar (3.40 cm). Gaikwad [5] studied different kagzi lime varieties and reported diameter in Local kagzi lime (3.59 cm), Vikram (3.51 cm) and Pramalini (3.35 cm).

Significantly highest juice percent was recorded in PDKV lime (50.33%) followed by Pramalini (48.20%) and the lowest juice per cent was recorded for Tenali (41.67%). The juice content increased with the development of the fruit till they were ripe [6].

Peel thickness differed significantly for different varieties of acid lime. The PDKV lime (1.16 mm) recorded significantly lowest peel thickness followed by Tenali (1.30 mm). The highest peel thickness was recorded in Chakradhar (1.77 mm). This result were confirm with result noted by Prasad [7] who reported that, the peel thickness ranges

from 0.89 mm to 2.13 mm in acid lime. Gaikwad [5] reported similar findings in Vikram and Sai-Sharbati.

Biochemical attributes

Significantly highest TSS was found in Pramalini (7.83 °Brix), followed by PDKV lime (7.73 °Brix) and in Tenali (7.40 °Brix). The increase in TSS content is mainly due to increase in total sugars [8].

This result are in line with Ingle et al. [3], they recorded highest TSS in Pramalini (7.75 °Brix) while lowest TSS was recorded in Chakradhar.

Lowest acidity was observed in Sai Sarbati (7.13%) followed by Tenali (7.40%) whereas the highest acidity was found in Chakradhar (8.23%). Similar trends were observed by Desai et al. [9]. They noted observed lowest acidity in Sai Sharbati (7.29).

Significant variation was observed in ascorbic acid content of acid lime fruit of different varieties of acid lime. Significantly maximum ascorbic acid was found in PDKV lime (30.33 mg/100 g) followed by Pramalini (29.13 mg/100 g). The lowest ascorbic acid content was recorded in Mangali-Pattu (27.17 mg/100 g). The increase in ascorbic acid was associated with rapid increase in total sugar as the fruit synthesizes ascorbic acid from hexose sugar precursors [10].

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