

SEASONAL VARIATION IN FRUIT YIELD OF PAPAYA (*CARICA PAPAYA* L.) VARIETIES**M. Reni, K. B. Sheela and V. K. Raju**

College of Horticulture, Kerala Agricultural University, Thrissur, India

Abstract: Evaluation of 12 varieties of papaya for yield revealed that variety CO-6 was the highest yielder (52.5 kg) and Solo had the maximum number of fruits (73.38). Study on the production pattern of papaya varieties indicated that highest yield was obtained in the 7th and 8th month of harvest in most of the varieties corresponding to the month of October-November whereas the yield was least during June-July under Kerala conditions.

Key words: Papaya, production pattern, seasonal variation, varieties

INTRODUCTION

High yielding potential, year round fruiting behaviour and a short pre-bearing period make papaya unique among fruit crops. Papaya cultivation in Kerala is mostly confined to the homesteads and plants grown exhibit considerable variability though generally low in productivity due to inadequate management. Due to the awareness of multifold uses of papaya as table, processing and papain extraction purposes, it is slowly emerging from the status of a homestead crop to that of a commercial crop. Though papaya is a highly adaptive crop, the performance of a particular cultivar shows variation under varying soil and climatic conditions. Hence, a trial to study the production pattern of important released varieties of papaya was undertaken in this background.

MATERIALS AND METHODS

The trial was conducted at College of Horticulture, Kerala Agricultural University, Vellanikkara, Trichur during 1995 to 1997. Twelve varieties of papaya including nine released varieties from different centres and three promising local types were used for the study. The study included released varieties CO-2, CO-3, CO-4, CO-5, CO-6, Solo, 9-1-D, MS, Honey Dew and local types CP-14, CP-15 and CP-16. The experiment was laid out in RBD with four replications with two plants per plot at a spacing of 2 m x 2 m. The soil of the experimental field was acid laterite (pH 5) and a well drained. FYM was applied as a basal dose @ 10 kg per pit. Factomphos and muriate of potash were used as inorganic sources according to package of practices recommended (KAU, 1993). The plants were irrigated during summer months and the field was kept weed free. The fruits were har-

vested at the colour-break stage and weight recorded. Monthly production of papaya varieties were studied by recording the monthly cumulative yield and number of fruits for a period of one year commencing from the first month of harvest.

RESULTS AND DISCUSSION

Varieties varied significantly for yield per plant both in terms of weight and number of fruits (Table 1). CO-6 was found to be the

Table 1. Yield of different papaya varieties

Variety	Yield (kg/plant)	No. of fruit/plant
CP-14	27.28	31.50
CP-15	18.06	43.13
CO-2	29.30	29.00
CO-3	38.22	55.63
9-1-D	46.85	46.25
MS	30.99	37.25
CO-4	44.26	39.45
CO-5	41.23	34.88
CO-6	52.50	42.63
Solo	19.43	73.38
CP-16	15.24	40.25
Honey Dew	37.47	43.75
CD (0.05)	20.4*	22.59*

* Significant at 5% level

highest yielding variety (52.5 kg) in terms of fruit weight and CP-16 the lowest (15.24 kg). With respect to number of fruits, Solo ranked first (73.38) followed by CO-3 (55.63). Variety CO-2 had the least number of fruits (29.00). It was noticed that as the size of the fruit increases the number of fruits per plant decreases. Suma (1995) also reported that fruit yield displayed the highest association

Table 2. Production pattern of papaya varieties

Variety	Monthwise yield (kg per plant)											
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
CP-14	0.99 (1.19)	1.98 (1.41)	1.25 (1.26)	2.59 (1.62)	4.51 (1.88)	1.46 (1.28)	4.45 (2.11)	2.66 (1.61)	3.24 (1.80)	2.62 (1.67)	1.19 (1.25)	0.33 (0.89)
CP-15	0.67 (1.07)	0.67 (1.05)	1.57 (1.33)	1.00 (1.13)	1.58 (1.44)	2.71 (1.75)	1.85 (1.46)	4.78 (2.26)	2.45 (1.62)	0.71 (0.99)	0.08 (0.75)	0.00 (0.71)
CO-2	2.28 (1.58)	2.12 (1.49)	1.60 (1.36)	1.07 (1.23)	2.90 (1.61)	0.68 (1.05)	5.77 (2.18)	2.57 (1.54)	2.77 (1.70)	4.42 (1.98)	2.30 (1.58)	0.89 (1.08)
CO-3	0.89 (1.16)	1.34 (1.33)	1.76 (1.39)	0.00 (0.71)	3.70 (1.86)	5.66 (2.45)	7.30 (2.68)	4.78 (2.28)	5.43 (2.41)	3.67 (2.03)	2.24 (1.50)	1.46 (1.32)
9-1-D	1.33 (1.34)	2.12 (1.43)	0.67 (1.03)	0.23 (0.83)	4.89 (2.20)	3.42 (1.92)	10.76 (3.24)	5.94 (2.52)	5.93 (2.45)	5.24 (2.18)	3.29 (1.83)	3.05 (1.64)
MS	3.98 (2.05)	3.65 (1.99)	4.61 (2.13)	4.51 (2.11)	2.73 (1.74)	3.50 (1.87)	4.34 (2.11)	1.63 (1.42)	0.81 (1.05)	0.64 (0.97)	0.23 (0.83)	0.37 (0.88)
CO-4	2.80 (1.78)	2.81 (1.76)	3.16 (1.88)	2.76 (1.70)	3.37 (1.84)	7.95 (2.89)	5.64 (2.40)	5.98 (2.37)	3.90 (1.93)	1.18 (1.18)	1.88 (1.35)	2.85 (1.55)
CO-5	1.67 (1.41)	0.05 (0.74)	1.26 (1.22)	1.81 (1.23)	4.70 (1.91)	4.39 (1.95)	4.37 (2.14)	10.26 (3.21)	4.11 (2.08)	3.59 (1.88)	2.77 (1.69)	2.25 (1.47)
CO-6	1.33 (1.34)	3.11 (1.89)	3.01 (1.87)	0.48 (0.95)	4.28 (1.84)	6.82 (2.46)	8.64 (2.95)	7.34 (2.78)	6.18 (2.42)	2.35 (1.62)	5.77 (2.24)	3.19 (1.84)
Solo	0.51 (0.99)	1.09 (1.24)	0.30 (0.88)	0.00 (0.71)	0.26 (0.86)	3.25 (1.84)	3.41 (1.94)	4.51 (2.18)	2.84 (1.81)	1.82 (1.50)	1.21 (1.26)	0.24 (0.84)
CP-16	1.70 (1.47)	1.33 (1.24)	2.65 (1.75)	0.55 (1.00)	2.57 (1.61)	2.65 (1.68)	1.80 (1.44)	1.31 (1.27)	0.29 (0.89)	0.23 (0.85)	0.13 (0.78)	0.05 (0.74)
Honey Dew	1.41 (1.37)	2.63 (1.73)	0.54 (0.98)	0.52 (0.97)	1.53 (1.37)	3.57 (1.96)	6.65 (2.62)	5.80 (2.33)	5.40 (2.26)	4.24 (2.03)	3.47 (1.77)	1.72 (1.48)
CD (0.05)	1.76* (0.50)	NS	2.34* (0.72)	2.67* (0.76)	NS	NS	NS	4.82* (1.04)	NS (.96)*	3.90*	NS	NS

Figures in parentheses indicate transformed values. NS = Nonsignificant; *Significant at 5% level.

with the fruit weight. Auxilia (1995) reported that the heavier fruits borne on the tree drain the nutrients resulting in flower skip.

Study on the production pattern of varieties revealed significant difference between varieties and months of harvest. Data on monthwise yield of fruits showed that varieties CO-2, CO-3, 9-1-D, CO-6 and Honey Dew had the maximum yield in the seventh month of harvest with 5.71, 7.30, 10.76, 8.64 and 6.65 kg respectively (Table 2). Maximum number of fruits was also recorded during the seventh month of harvest for the cultivars CP-14, CO-3, 9-1-D, CO-6 and Honey Dew with 5.13, 10.0, 9.88, 7.50 and 8.38 fruits per tree, respectively (Table 3). In the cultivars CP-15, CO-5 and Solo maximum yield and maximum number of fruits were obtained in the eighth

month of harvest. The production was lean in the fourth month of harvest in CO-3, 9-1-D, CO-6, Solo and Honey Dew. The peak period of production both in terms of fruit weight and number of fruits was either the 7th or 8th month of harvest in most of the varieties corresponding to October-November. In these varieties, flowering might have occurred during May-June, which resulted in high fruit set. The fruit growth and yield was favoured by the southwest monsoon. Minimum yield was recorded during June-July where the flowering might have occurred during January-February. This period corresponds to summer with low moisture regime and frequent dry wind. Dry period adversely affected flowering and fruit set in all the varieties, which led to poor yield in June-July. Singh and Singh (1998) also reported that the yield distribution

Table 3. Production pattern of papaya varieties

Variety	Number of fruits per plant, monthwise											
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
CP-14	1.50 (1.40)	2.00 (1.43)	1.50 (1.36)	3.25 (1.74)	3.00 (1.70)	1.88 (1.38)	5.13 (2.30)	3.50 (1.85)	3.88 (1.89)	3.25 (1.77)	2.13 (1.49)	0.50 (0.97)
CP-15	1.25 (1.31)	1.63 (1.43)	2.00 (1.47)	1.38 (1.24)	3.25 (1.83)	6.63 (2.47)	6.50 (2.35)	10.50 (3.16)	6.13 (2.35)	3.25 (1.45)	0.63 (1.00)	0.00 (0.71)
ro-2	2.50 (1.70)	2.63 (1.65)	2.25 (1.52)	1.50 (1.39)	3.50 (1.72)	1.00 (1.18)	3.63 (1.83)	2.13 (1.44)	2.00 (1.51)	4.13 (1.96)	2.75 (1.68)	1.00 (1.13)
CO-3	1.88 (1.50)	2.38 (1.57)	3.25 (1.74)	0.00 (0.71)	5.75 (2.21)	8.00 (2.89)	10.00 (3.06)	6.63 (2.63)	7.25 (2.73)	5.00 (2.28)	3.50 (1.85)	2.00 (1.47)
9-1-D	2.50 (1.67)	2.25 (1.47)	0.75 (1.06)	0.25 (0.84)	4.63 (2.12)	3.75 (2.00)	9.88 (3.15)	5.38 (2.40)	5.00 (0.233)	4.75 (2.15)	4.38 (2.06)	2.75 (1.58)
MS	4.38 (2.14)	4.75 (2.18)	4.88 (2.22)	4.63 (2.14)	2.63 (1.71)	5.25 (2.26)	4.88 (2.22)	2.38 (1.67)	1.25 (1.191)	1.00 (1.06)	0.50 (0.93)	0.73 (1.00)
CO-4	2.75 (1.77)	3.75 (2.01)	3.00 (1.85)	2.63 (1.66)	3.00 (1.76)	6.50 (2.64)	5.63 (2.41)	5.25 (2.30)	2.50 (1.61)	0.33 (0.88)	1.88 (1.40)	2.25 (1.39)
CO-5	2.25 (1.56)	0.25 (0.84)	1.38 (1.25)	1.75 (1.22)	4.75 (1.92)	3.88 (1.87)	2.75 (1.78)	5.38 (2.39)	3.88 (2.03)	3.38 (1.84)	2.75 (1.69)	2.50 (1.52)
CO-6	1.00 (1.23)	3.00 (1.84)	2.25 (1.66)	0.50 (0.97)	2.75 (1.57)	5.50 (2.26)	7.50 (2.74)	6.25 (2.58)	6.25 (2.43)	1.75 (1.48)	3.25 (1.80)	2.63 (1.72)
Solo	3.00 (1.81)	5.25 (2.31)	1.13 (1.18)	0.00 (0.71)	1.25 (1.27)	10.38 (3.22)	14.00 (3.69)	15.63 (3.99)	9.86 (3.21)	6.88 (2.68)	5.00 (2.25)	1.00 (1.13)
CP-16	4.88 (2.26)	4.50 (1.96)	6.25 (2.49)	1.25 (1.26)	5.50 (2.22)	5.63 (2.30)	4.38 (2.04)	3.88 (1.94)	1.75 (1.48)	1.50 (1.35)	0.50 (0.97)	0.25 (0.84)
Honey Dew	2.50 (2.50)	4.13 (2.13)	0.88 (1.10)	0.50 (0.97)	2.00 (1.51)	5.13 (2.32)	8.38 (2.94)	5.75 (2.40)	4.50 (2.19)	4.50 (2.16)	3.00 (1.76)	2.50 (1.70)
CD (0.05)	NS	NS	NS (1.88)*	NS (0.83)*	NS	NS	NS	5.52* (1.07)*	4.42* (1.00)*	NS	NS	NS

Figures in parentheses indicate transformed values; NS = Nonsignificant; *Significant at 5% level.

pattern of papaya is largely governed by temperature in the environment, the plant can change its development either by extending the vegetative period by providing more leaves before the growing points become reproductive, or by delaying differentiation of the flower primordia.

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REFERENCES

- Auxilia, J. 1995. Screening papayas for yield and quality of fruit and latex. M.Sc.(Hort.) thesis, TNAU, Coimbatore
- KAU. 1993. *Package of Practices Recommendations - Crops*. Kerala Agricultural University, Directorate of Extension, Mannuthy, Thrissur, p.196-198
- Singh, G. and Singh, A.K. 1998. Physico-chemical quality of papaya fruits (*Carica papaya* L.) as influenced by different planting times. *Indian Fd Packer* 52(3):28-32
- Suma, A. 1995. Breeding investigations in papaya (*Carica papaya* L.). Ph.D.(Hort.) thesis, TNAU, Coimbatore