

Original Research Article

Effect of Different Levels of Pruning on Growth and Yield of Custard Apple (*Annona squamosa* L.)

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ABSTRACT

A study was undertaken to investigate the effect of different levels of pruning on growth and yield of custard apple (*Annona squamosa* L.), cultivar Dharur-6 of eight years old plants spaced at 4×4 m² at Custard Apple Research Station, Ambajogai, district Beed during the year 2016-2017. The experiment was laid out in a Randomized Block design with six treatments viz., 5 cm, 10 cm, 15 cm, 20 cm, 25 cm and control after harvesting of previous year fruits with four replications. The investigation indicated, the pruning at 20 cm shows maximum number of shoots branch⁻¹ (174.00), number of flowers branch⁻¹ (260.48), number of fruits plant⁻¹ (66.00), fruit yield plant⁻¹ (17.35 kg) and fruit yield ha⁻¹ (10.84 t) compared to other treatments. Pruning and defoliation are essential operations for inducing off-season flowering and fruiting to getting better yield of fruits in custard apple. Hence, it is therefore suggested that, treatment pruning at 20 cm can be used to maintain growth and yield of custard apple.

Keywords

Pruning, Growth,
Yield, Custard
apple

Introduction

Custard apple (*Annona squamosa* L.) a member of annonaceae family is a tropical and subtropical fruit tree which is widely distributed in Asia, Africa and the America (Nakasone and Pual, 1998). The *Annona*'s are distributed in the entire globe, due to their suitability to different climatic condition. Custard apple is grown commercially in West Indies, Florida, Mexico, Brazil, Malaysia, Thailand, Philippines and Egypt. In India the area under custard apple cultivation is about 35000 ha with the production of 271000 MT out of these Maharashtra state contributes 8660 ha area with 59300 MT production (Anonymous, 2016). Custard apples are used both in Ayurvedic and Yunani system of

medicines. The seeds of the fruit have insecticidal and abortifacient properties. Similarly, seed oil is suitable for soap making and seed cake can be used as manure (Naidu and Saetor, 1954). Custard apple has many alkaloids, such as aporohine, romerine, norocoydine, squamonine corydine, norisocrotydine, glaucine and anononaine in different parts of the plants (Kowlska and Putt, 1990). Pruning is essential to maintain the proper balance between vegetative growth and reproductive growth. More severity of pruning in tree leads to higher vegetative growth keeping in view importance of severity of pruning in maintaining balance between vegetative growth and fruit production (Feree *et al.*, 1984; Marini and Barden, 1987; Mika, 1986; Saure, 1987).

Materials and Methods

The present investigation was carried out at Custard Apple Research Station, Ambajogai, district Beed, Maharashtra, India during 2016-17. The experimental material consists of 8 years old uniform plants spaced at 4×4 m² of custard apple cv. Dharur-6. The trees were mentioned under uniform cultural practices during the entire course of investigation. The pruning was done 1st week of April 2016 and treatment consist of 6 pruning levels, *i.e.* pruning at 5 cm, pruning at 10 cm, pruning at 15 cm, pruning at 20 cm, pruning at 25 cm and no pruning (control) with 4 replications in Randomized Block Design. The observations on growth and yield were recorded at monthly interval in randomly selected uniform healthy plants which were labelled. The statistical analysis done as per procedure given by Panse and Sukhatme (1967).

Results and Discussion

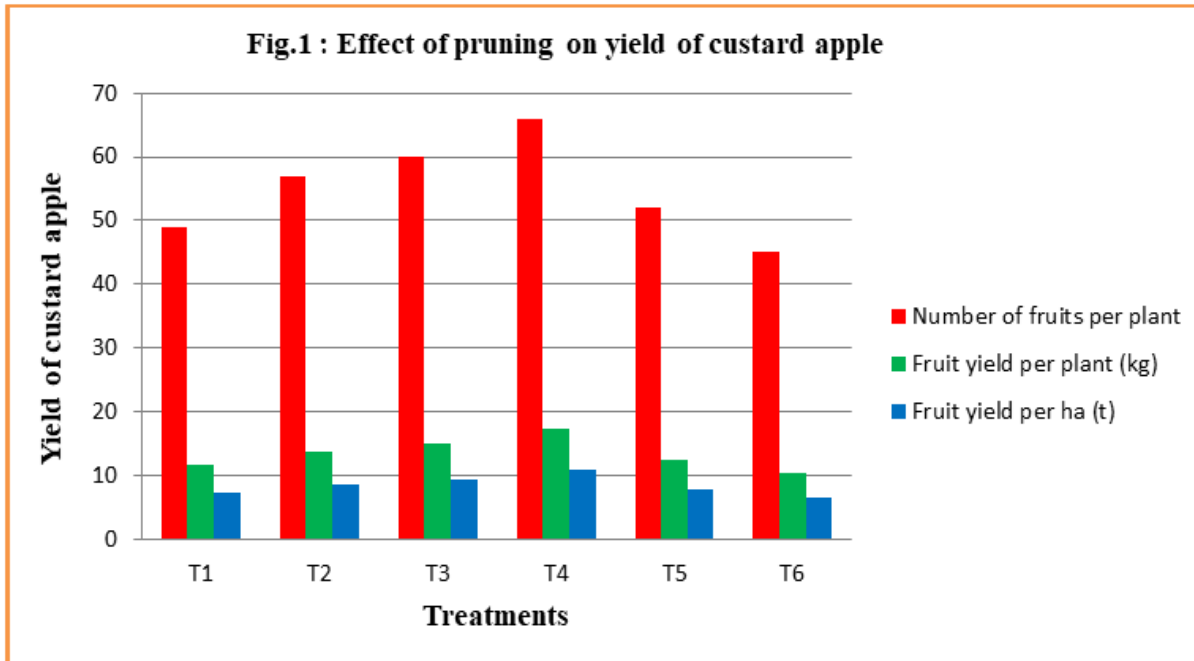
Effect of pruning on growth of custard apple

It is revealed from the data (Table 1), among

the all treatments significant effect of number of shoots branch⁻¹ (174.00) and number of flowers branch⁻¹ (260.48) was recorded in treatment T₄ (pruning at 20 cm). The maximum plant spread was non-significantly recorded East-West (2.27 m) in treatment T₄ (pruning at 20 cm) and South-North (2.70 m) in treatment T₁ (pruning at 5 cm). This might be due to the juvenility is more at the base of a tree or branch and gets gradually reduced in acro petal manner towards distal end. Thus it is hard to believe to have more fruitful buds located on lower portion as branches, at the times of pruning. This would need more time for visible appearance of flowers on pruned tree. These finding are in accordance with results reported by Ghum (2011) in Custard apple and Lakpathi *et al.*, (2013) in guava. While, data regarding minimum days required for flowering was recorded in treatment T₆ control (95.84). This might due to pruning stimulates flowering and fruit production as availability of nutrients are in sufficient quantities of the plant to carry out their metabolic and physiological processes. These finding are in accordance with results reported by Patil (1987) in ber, Pawar (1993) in pomegranate and Adhikari *et al.*, (2015) in kagzi lime.

Table.1 Effect of pruning on growth and yield of custard apple

Treatments	Number of shoots per branch	Number of flowers per branch	Days required for flowering	Plant spread		Number of fruits per plant	Fruit yield per plant (kg)	Fruit yield per ha (t)
				East-West (m)	South-North (m)			
T ₁	132.48	218.32	96.00	2.04	2.70	49.00	11.61	7.25
T ₂	152.74	234.66	96.46	2.10	2.24	57.00	13.81	8.63
T ₃	161.00	248.80	97.00	2.12	2.27	60.00	15.06	9.41
T ₄	174.00	260.48	97.95	2.27	2.38	66.00	17.35	10.84
T ₅	140.08	226.14	98.14	2.11	2.06	52.00	12.42	7.76
T ₆	118.06	204.38	95.84	2.20	2.38	45.00	10.39	6.49
S.E.±	4.58	7.01	2.99	0.09	0.13	3.83	0.87	0.51
C.D at 5%	13.81	21.10	NS	NS	NS	11.56	2.65	1.55



Effect of pruning on yield of custard apple

It is revealed from the data (Table 1 and Fig. 1), the maximum of number of fruits plant⁻¹ (66.00), yield plant⁻¹ (17.35 kg) and yield ha⁻¹ (10.84 t) was recorded in treatment T₄ (pruning at 20 cm) as compared to rest of treatments. This might be due to pruning is forced tree into investing more of its energy into manufacture of fructose instead of cellulose. Pruning increases ability to take water, carbon dioxide and sunlight to make carbohydrates or sugars which ultimately encourage the tree to produce more fruits. These findings are in accordance with the results obtained by Masalkar and Joshi (2009), Sheikh and Rao (2002) in pomegranate, Ghum (2011) in custard apple and Sharma (2014) in apple.

In conclusion, light pruning at 20 cm level on plant shoots after harvesting of previous crop is beneficial for improving growth and yield of custard apple 'cv. Dharur-6' these finding are based on one season data.

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