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Research Article

CONTROL OF PHYTOPHTHORA FRUIT DROP IN SAPOTA BY PRUNING

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ABSTRACT

Objectives: The present investigation is carried to study the effect of pruning level on the incidence of fruit drop in sapota.

Methods: An experiment on pruning in sapota was conducted at the Agricultural School, Kosbad Hill, Dahanu, District Palghar, Maharashtra, India, during the year 2008-2013 with three pruning treatments, *viz.*; heading back up to 3.0 m, heading back up to 1.0 m, center opening and thinning and untreated as control. The 50-year-old over crowed sapota trees were pruned as per the treatments in October 2008.

Results: The 3 years (2011, 2012, and 2013) results revealed that all the treatments were significantly superior over control. The least percent incidence of Phytophthora fruit drop (3.19, 4.13, and 4.25%) was recorded in the treatment T_4 (Center opening and thinning) followed by T_2 (Heading back 3.0 m) and T_3 (Heading back 1.0 m), respectively. The maximum fruit yield (104.4 kg plant^{-1} and 10.4 tones ha^{-1}) was recorded in T_4, i.e., Center opening and thinning was found to be significant overtreatment T_2, i.e., heading back 3 m (16.60 kg plant^{-1} and 1.66 tones ha^{-1}).

Conclusion: The center opening and thinning of over crowed sapota trees improved the fruit weight, yield, and also controlled the incidence of fruit drop.

Keywords: Sapota, Fruit drop, Pruning, Yield.

INTRODUCTION

Sapota (*Manilkara achras* Mill Forsberg) is the one of the most important irrigated tropical fruit crops in Maharashtra. The area under this crop in Maharashtra is around 69,000 ha, of which, 70% area is in only Thane district. It has unique importance in the economy of the farmers in the district. The area under this crop is increasing day by day. Further, the government schemes such as Employment Guarantee Scheme and National Horticulture Mission are promoting the cultivation of sapota crop. The sapota fruits of "Gholwad pockets in Thane" are very famous in India as "Gholwad Chikoo." The orchards have been established since last century, which are more than 80-100 years old, very dense and having a maximum height that sunlight cannot penetrate inside the canopy. This leads to low productivity, the incidence of pest and diseases such as fruit drop. Similarly, it becomes difficult to follow intercultural operations such as harvesting and spraying for control of pest and disease (Anonymous, 2014) [1]. The canopy management is the unique agrotechnique in fruit crops, like mango with systematic approaches. It helps to improve the tree architecture of tree owing to more light penetration in internal canopy, more area for fruiting, easy for carrying field operations such as harvesting and plant protection and also leads to less incidence of pest and diseases, superior quality fruit. That ultimately results in high production with high productivity and economically viable crop returns. Jackson (1980) [2] described a close relationship between light interception, photosynthesis, and yield in the fruit tree orchards.

Sapota fruit drop is a serious disease in this region. In severe cases, the yield loss might be more than 50%. Heavy rain during monsoon, poor drainage leads to severity of disease. With this view, the present investigation is carried to study the effect of pruning level on incidence of fruit drop in sapota.

METHODS

The experiment on pruning in sapota was conducted at the Agricultural School, Kosbad Hill, Dahanu, District Palghar, Maharashtra, India, during the year 2008-2013 on 50-year-old over crowed sapota trees planted at 10×10 m spacing. The experiment was conducted in randomized block design with five replications and four treatments of pruning. For pruning the trees, three treatments were imposed, *viz.,* heading back 3 m (T_2), heading back 1 m (T_3), center opening and thinning (T_4) with control (T_1). Each treatment had four trees in every replication. The recommended cultural practices were followed. The observations on the incidence of fruit drop, yield were recorded. The data were statistically analyzed as the procedure described by Panse and Sukhatme (1985) [3].

RESULTS AND DISCUSSION

The present study revealed that treatment T_4, i.e., center opening and thinning gave maximum fruit yield (104.4 kg/plant and 10.4 t/ha) and was found to be significant (Table 1) over heading back 3 m (T_2) treatment (16.60 kg/plant and 1.66 t/ha). In the treatment "heading back up to 3.0 m," the yield level was comparatively low due to the pruning of canopy. It caused a reduction in fruiting twigs. The center opening and thinning might be helpful for proper penetration of sunlight in the tree canopy. It also helped to improve the fruit size.

The results of 3 years (2011, 2012, and 2013) on percent incidence of Phytophthora fruit drop revealed that (Table 2) all the treatments were significantly superior over control. It is observed that the least

Table 1: Effect of pruning on yield in sapota (Pooled)

Treatments	Fruit yield (kg/tree)	Fruit yield (t/ha)	Average fruit weight (g)
T_1	67.06	6.70	53.73
T_2	16.60	1.66	55.20
T_3	33.40	3.34	56.93
T_4	104.40	10.44	59.40
S.E±	3.79	0.37	0.41
C.D@ 5%	11.69	1.16	1.27

Table 2: Effect of pruning treatments on sapota fruit drop

Treatments	Mean incidence of sapota fruit drop			
	2011	**2012**	**2013**	**Pooled**
Control	21.38 (27.57)*	23.94 (29.31)	25.69 (30.43)	23.67 (29.11)
Heading back 3 m	4.88 (12.75)	5.75 (13.83)	6.06 (14.19)	5.56 (13.63)
Heading back 1 m	6.38 (14.57)	6.94 (15.19)	9.06 (17.49)	7.46 (16.22)
Center opening and thinning	3.19 (10.36)	4.13 (11.75)	4.25 (13.67)	3.85 (11.12)
SE±	0.6135	0.7162	1.2203	0.3943
C.D@ 5%	1.8905	2.207	3.7604	1.2151

*Figures in parenthesis are arcsine transformed values

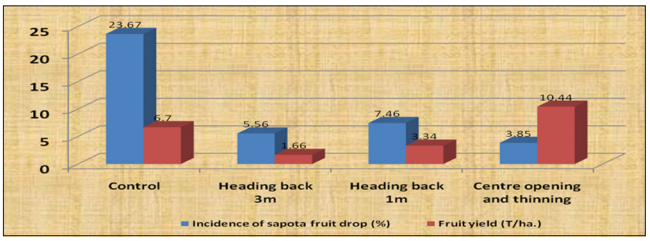

Fig. 1: Effect of pruning treatments on incidence and fruit drop and yield in sapota

percent fruit drop (3.85%) was recorded in the treatment T_4 followed by T_2 and T_3. Thus, pruning has a significant influence on control of sapota fruit drop and ultimately increased the yield (Fig, 1) and life of orchards. The role of pruning was also reported by Shinde *et al.*, 2002 [4].

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