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Regulation for off season flowering and fruiting habit in mango with paclobutrazol

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Abstract : Field experiment were conducted at Agricultural College and Research Institute, Killikulam, Tamil Nadu Agricultural University to study the influence of Paclobutrazol on 'off' season flowering of Mango and also to standardize the doze and time and application The results suggested a positive effect of treatment T₆ - 3 ml/m diameter applied during May recording highest mean number of inflorescences / tree(28.83), lengthier inflorescence(29.38), maximum number of fruits per tree (33.00 No.) highest yield per plant (9.92 kg) and an average fruit weight of 275.35 grams. Application of paclobutrazol preponed the flower initiation and fruit harvest, thereby inducing production out of season, fetching higher prices and more profitability

Key words : Fruiting habit, Off season, Flowering and fruiting, Mango, Pactabutrazole, PBZ

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Mango (*Mangifera indica*. L.) is an important fruits crop grown for a very long time and cultivation is increasing but in India the productivity is still low and irregular. In Tamil Nadu the productivity is only around 4.3 T/ha (2005-2006). Neelum is one of the popular and regular bearing variety of Tamil Nadu which also bears during the off season in Tirunelveli and Kanyakumari districts of Tamil Nadu thus fetching higher returns to the farmer. Off season flowering is observed during September October months in Tirunelveli and Kanyakumari districts with the fruiting period during January February - a very early start with good demand for the fruits. The flowering process is the critical point for the fruit production. The induction of flowering in mango through chemical substances, such as paclobutrazol, blocks the biosynthesis of gibberellins (GA₁), and reduces the growth of plants thereby leading to blossoming (Rademacher, 1991). Several attempts on flowering induction show significant results in regulating off-season production of mango. The application of paclobutrazol followed by application of a dormancy-breaking substance has forced mango, citrus and mango stein trees to produce off-season flowers and with this

technique, mango trees can be forced to flower practically at any time (Poerwanto *et al.*, 2008). Such action can induce off season production of mango for times of the best prices. Hence, a study was conducted to analyse the effect of paclobutrazol (PBZ) in regulation of off-season flowering and to standardize the dose and time of application of paclobutrozol to induce off-season flowering on mango production.

The trial was carried out over four years at Agricultural College and Research Institute, Killikulam, Thoothukudi district, Tamil Nadu during 1999 to 2002 under rainfed condition in the variety Neelum. This zone is characterized by a mean maximum temperature of 35°C, a mean minimum temperature of 24°C and annual precipitation of 640 mm. The experimental design used was randomized block with five replicates. Each replicate had five plants. Paclobutrozol was applied as soil drenching. Seven treatments were applied *viz.*, T₁- Control, T₂- Paclobutrazol@3ml/m diameter 120 days before bud break, T₃- Paclobutrazol @ 5ml/m diameter 120 days before bud break, T₄- Paclobutrazol @ 3ml/m diameter 90 days before bud break, T₅- Paclobutrazol @ 5ml/m diameter 90 days before bud break, T₆-

Table 1 : Regulation of off season flowering and fruiting habit in mango with pactobutrazol

Treatments	Mean No. of inflorescences / tree	Mean length of inflorescence (cm)	No. of fruits / tree	Yield / tree (kg)	Avg. fruit weight (g)
T ₁ – Control	3.00	16.02	1.1	0.242	242.00
T ₂ – 3 ml/m diameter applied during March	5.17	17.89	4.85	1.69	287.46
T ₃ – 5 ml/m diameter applied during March	6.50	19.89	3.30	0.78	243.80
T ₄ - 3 ml/m diameter applied during April	10.56	24.83	7.46	3.01	297.53
T ₅ – 5 ml/m diameter applied during April	33.0	24.31	15.72	5.46	329.85
T ₆ - 3 ml/m diameter applied during May	28.83	29.38	33.00	9.92	275.35
T ₇ - 5 ml/m diameter applied during May	6.75	21.05	12.62	3.70	274.89
C.D. (P=0.05)	24.49	14.31	11.92	3.94	42.59

Paclobutrazol @ 3ml/m diameter 60 days before bud break and T₇- Paclobutrazol @ 5ml/m diameter 60 days before bud break. The treatments were applied in all the years. The variables evaluated were mean number of inflorescences / tree, mean length of inflorescence (cm), fruit number per plant, average fruit weight and yield per plant. The treatments showed significant statistical differences for the variables studied.

In the studies on regulation of off season flowering and fruiting habit in mango with pactobutrazol the data on pooled mean for three years (1999-2002) on flowering and yield are presented in Table 1.

There were significant differences between the treatments for the mean number of inflorescence per tree and mean length of inflorescence. Maximum number of inflorescence (33.0) was observed in T₅ (paclobutrazol applied at 5 ml/m diameter applied during April) followed by T₆ (28.83) which were at par. The minimum was recorded in the control. The mean length of the inflorescence was maximum in T₆ (29.38 cm) followed by T₄ and T₅ (24.83 and 24.31, respectively) which were all at par. The number of fruits per tree was the highest in T₆ (33) followed by T₅ (15.72) fruits. Similar trend was observed in the yield also with the treatment T₆ registering highest yield of 9.92 kg followed by T₅ (5.46 kg) while the least was observed in the control. The yield varied from 0.78 kg to 5.46 kg in the other treatments. These results are in line with Cardoso *et al.* (2007) who observed a higher percentage of flowering and fruit production with paclobutrazol at 0.40g a.i/m canopy in comparison to the control. Similar result was also observed by Singh and Ranganath (2006) in cv. BANGANAPALLI where regular, profuse and early bearing was found to be due to paclobutrazol application. The average fruit weight was maximum in T₅ (329.85 g) followed by T₄.

Summary :

Field experiment were conducted at Agricultural College and Research Institute, Killikulam, Tamil Nadu Agricultural University to study the influence of Paclobutrazol on 'off' season flowering of mango and also to standardize the doze and time and application. The results suggested a positive effect of treatment T₆ - 3 ml/ m diameter applied during May recording highest mean number of inflorescences / tree(28.83), lengthier inflorescence(29.38), maximum number of fruits per tree (33.00) highest yield per plant (9.92 kg) and an average fruit weight of 275.35 g. Application of paclobutrazol preponed the flower initiation and fruit harvest, thereby inducing production out of season, fetching higher prices and more profitability.

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