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EFFECT OF DIFFERENT CHEMICALS AND POLYTHENE COVER ON FRUIT S CARRING BEETLE AND FRUIT CHARACTERS ON BANANA CV. Malbhog GROWN IN ARECANUT GARDEN UNDER SUB HIMALAYAN TERAI REGION OF WEST BENGAL

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ABSTRACT

Fruit Scarring beetle is an important problem of banana in rainy season which suc the saps of young fruit causing considerable losses on quality of fruits. Different chemicals spray, polythene bag covering and both of their combination was used to minimize the affect of this beetle. The study indicates that bunch covering with polythene tubes had better effect on almost all paramcters studied. Spraying of neem kernel extract 15 % at 1.5 ml/l and simultaneously bunch covering minimizes the number of scar on fruits. It also had better effect on bunch length, hand weight, number of fingers/bunch and hand, fruit length, width and weight and total bunch weight.

Key words: Polythene, NKE, Sub Himalayan, Bunch cover, Fruit carring beetle

INTRODUCTION

Arecanut is an important plantation crops grown in India. In West Bengal, a considerable area is under arecanut cultivation. The different intercrops raised and their diversity was reported by Bavappa (1951). No deleterious effect on yield and growth of areca palm due to intercropping with tapioca, elephant foot yam, yam, sweet potato was reported by several workers (Sadanandan, 1974). A number of field experiments have been conducted at CPCRI, RS, Vittal to assess, the productivity of the arecanut due to intercropping (Muralidharan and Nayar, 1979). Brahma (1973) mentioned about the suitability of banana as an intercrop under areca garden. Greater variation on the yield and profitability of individual crops was recorded from place to place due to variation in the Agro-climatic condition by Muralidharan and Nayar (1979). Cocoa and black pepper or banana, betel vine and lemon crops are profitable combinations under areca system for

Maidan parts of Karnataka (Sannamarappa, 1993). Similarly, pepper, banana, pineapple and turmeric are reported profitable intercrops at full dose of manuring for Assam region (Ray *et al.*2000). Cultivation of banana as inter crop in arecanut garden is profitable in North

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Bengal (Chenchaiah, *et al.* 2003). Due to microclimate formation in arecanut based cropping system, numbers of problems are found in the garden (Sit *et al.* 2005). Banana is a major component of inter crops in arecanut garden. It is also affected by several pests and diseases. Among them, fruit Scarring beetle (*Colaspis hypochlora*) is most important which affect the fruits by sucking the sap at early stage of fruit during rainy season and deteriorate the fruit quality of this crop. Hence, a study was conducted on control of this pest of banana grown under arecanut garden at CPCRI, Research Centre, Mohitnagar during the year 2008-09.

MATERIALS AND METHODS

The experiment was started at CPCRI, Research Centre, Mohitnagar during the year 2008-09. Banana was one of the important component crop of arecanut based cropping system under sub Himalayan terai region of West Bengal. Banana was planted at the centre of four arecanut palm in alternate row at a spacing of 2.7×5.4 m under the 35 years old arecanut plantation. Along with banana, black pepper was trailed on arecanut and acid lime was also planted in alternate row at spacing of 2.7 m×5.4 m. The experiment was started during rainy season when the attack of fruit scaring beetle was more. Different treatments like tying of perforated packets filled with 10 g Phorate 10 G (T_2), T_2 + bunch cover with polythene tube (T_3), spraying of Monocrotophos 36% EC @ 1.5 ml/l just after opening of first spathe and 15 days interval thereafter 3 times (T_4), spraying of Azadiractin 0.15% NKE @1.5 ml/l at just after opening of first spathe and 15 days interval thereafter (T_5), covering of inflorescence with polythene tube just at opening of spathe (T_6), spraying of Monocrotophos 36 5 EC @1.5 ml/l just after opening of first spathe and thereafter bunch covering with polythene tube (T_7), spraying of Azadiractin 1.5% (NKE) 1.5 at 1.5ml/l just after opening of first spathe and bunch covering thereafter with polythene tube and no treatment as control (T1). The experimental site was divided with four plots and considered as four replications. The randomized block design was followed. Each plot consisted with 36 banana plants. Sixteen number of banana plants from each four plots with just emergence of flower were selected. Different treatments were imposed in two bunches of each replication. A polythene tube of 2 ft width and 4 ft long with both side open was used. The polythene tube was perforated with 20% hole for aeration. The tube was tied with inflorescence stalk just before the opening of the spathe. Observations like number of scar present in fruits during harvesting, bunch length, days to physiological maturity, number of hands per bunch, number of fingers/hand, total number of fingers/bunch, peel pulp ration, days to ripening at room temperature was recorded. Average data was considered for statistical analysis with the methods given by Panse and Sukhatme (1995).

RESULTS AND DISCUSSION

The result of the experiment has been depicted in Table 1. All the parameters studied were varied significantly except length of bunch, number of hand/bunch, number of finger/bunch and peel pulp ratio. Length of bunch of all the treatments ranged between 108 cm (T_1) to 114 cm (T_7). Though bunch length was not varied significantly but the fruit bearing portion was statistically significant. It ranged between 78.0 cm to 83.0 cm. Maximum fruit bearing portion (83.0 cm) was observed in

Table 1. Fruit characters of banana at different treatments

Treatment	Length of bunch (cm)	Length of fruit bearing portion (cm)	Days to maturity	Bunch weight (kg)	No. of hand/ bunch	Hand weight (kg)	No. of finger/ bunch
T_1	108	78.0	94	09.0	7.3	1.26	84
T_2	108	78.0	92	12.0	7.8	1.65	76
T_3	110	80.0	103	19.0	9.6	2.34	94
T_4	109	81.0	104	13.0	8.5	2.08	90
T_5	109	78.6	98	12.0	8.6	1.62	91
T_6	112	83.0	86	20.0	9.0	2.28	105
T_7	110	82.0	105	20.0	9.3	2.32	101
T_8	114	82.2	81	22.0	9.5	2.54	104
SEM±	—	1.15	2.27	1.84	—	0.69	1.85
CD at 5%	NS	3.49*	6.87*	5.59**	NS	0.21*	5.61*
CV	—	2.48	4.11	20.57	—	5.91	5.17

Treatment	Finger weight (g)	Finger length (cm)	Finger width (cm)	No. of finger/ hand	Days to ripening after harvest	Peel pulp ratio	No. of scar/ bunch
T_1	110	11	9	13.3	8	2.16	209
T_2	112	11	11	13.2	8	2.25	197
T_3	165	15	14	14.0	6	3.02	58
T_4	124	14	11	13.0	9	2.48	139
T_5	126	14	11	14.0	8	2.76	61
T_6	160	16	15	14.0	7	3.16	28
T_7	162	17	14	15.0	6	4.25	18
T_8	170	18	15	16.5	6	4.46	6
SEM±	5.96	1.40	0.91	—	0.62	—	3.99
CD at 5%	17.83**	4.26**	2.97**	NS	1.87**	NS	11.98**
CV	7.50	16.97	12.78	—	14.75	—	7.22

T_8 followed by T_2 (82.2 cm), T_7 (82.0 cm), T_4 (81.0 cm) and T_3 (80.0 cm) but these treatments were statistically at par. Days to physiological maturity was varied significantly. Maximum days (105 days) require for physiological maturity was require for the treatment T_7 followed by T_4 (104 days) and T_3 (103 days) whereas minimum days (81) was recorded in T_8 followed by T_6 (86 days). Significant observation was noticed in bunch weight for all the treatments. Maximum bunch weight (22.0 kg) was recorded in T_8 followed by T_7 and T_6 (20.0 kg) and T_3 (19.0 kg). The bunch weight of the treatments T_8, T_7, T_6 and T_3 where bunch was covered with polybags and treated with chemical were statistically at par. Minimum bunch weight (9.0 kg) was observed in control where polythene tube and chemicals were not used. The effect of different chemicals on bunch weight had no significant differences. Though number of hand/bunch of all the treatments did not varied significantly but maximum number of hand/bunch (9.6) was recorded in T_3 followed by T_2 (9.5) and minimum number of hand/bunch (7.3) was recorded in control. The parameter hand weight was varied significantly for all the treatments and maximum hand weight (2.54 kg) was recorded in T_8 and this had significant differences with the other treatments. The hand weight of treatments T_7, T_6 and T_3 were statistically at par. Minimum hand was recorded in Control (T_1). It is observed that bunch weight has been increased with the application of chemicals or polythene cover or bothof their combination. About 133% (T_2) to 244% (T8) bunch weight has been increased over the control and it was also observed that where bunch was covered with polythene bag, bunch weight was increased more than the other treatments. Number of finger/bunch was recorded maximum (105) in T_6 followed by T_8 (104) and T_7 (101). The performance of T_6, T_8 and T_7 on number of fingers/bunch did not differ significantly but there was significant difference with the other treatments. Significant difference was noticed in finger weight, length and width. Maximum finger weight (170g) was recorded in T_8 followed by T_3 (165 g), T_7 (162 g) and T_6 (160 g). These four treatments were significantly differed with the other treatments. Minimum finger weight (110 g) was recorded in control (T_1). Different treatment had also significant effect on finger length and width. Maximum finger length (18 cm) and width (15 cm) was recorded in T_8 treatment and minimum finger length (11 cm) and width (9 cm) was recorded in T_1 (control). Number of finger/hand did not varied significantly but maximum number of finger/hand (16.5) was recorded maximum in T8 followed by T_7 (16) and T_6 (15). Days to ripening after harvest at room temperature was also recorded and significant observation was noticed among all the treatments. Minimum days require for ripening (6 days) was recorded in T8, T_7 and T_3. Pulp peel ratio did not varied significantly for all the treatments. Maximum pulp peel ratio (4.46) was recorded in T8 followed by T_7 (4.25) and T6 (3.16). Effect of different chemical spray, polythene cover and their combination against fruit Scarring beetle was studied and beetle effect was studied on the basis of number of scar present in whole bunch. It was observed that all the treatments varied significantly on number of scar present in bunch. Minimum number of scar/bunch (6) was recorded in T8 and this was varied significantly with all other treatments whereas maximum number of scar (209) was recorded in T_1 (control). Spraying of chemicals did not have much effect on fruit Scarring beetle. Considerable more number of scars was recorded where

chemical was sprayed alone. From the study, it was noticed that where polythene tube was used for bunch covering, there was less attack of fruit Scarring beetle. Besides this, it was also noticed that combination of chemical spray and bunch covering with polythene tube had significant effect on fruit size and shape, number of fingers/bunch and bunch weight than the chemical spray and bunch covering alone. Increase of fruit quality, fruit size and total bunch weight was also reported by Comelli (1960) under Israil condition, Berill (1956) under New South Wales and Queensland condition and Gopalkrishna and Deo (1960) under Indian condition. Among the combination of chemical and bunch covering T_8 i.e. spraying of NKE and bunch covering with polythene tube was better than the other combination. Among the chemicals, spraying of NKE alone had better performance than the other chemicals like phorate and monocrotophos. From the study it is concluded that bunch covering with polythene tube is good for minimization of fruit Scarring beetle attack. Besides this spraying of NKE at first spathe opening, then bunch covering till harvest not only minimize the beetle attack but also increase the fruit size and bunch weight.

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