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Short Communication

EVALUATION OF NEW MOLECULES AGAINST SCARLET MITE, *Raoiella indica* IN ARECANUT

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ABSTRACT

Scarlet mite *Raoiella indica* Hirst (Acari: Tenuipalpidae) is an important sucking pest on young arecanut palms during dry weather in areca growing tracts. The registered insecticides that provide adequate control of the pests need repeated application in higher doses which result in adverse effects on environment and health. In order to circumvent the problems, replacement of conventional insecticides with new powerful molecules at lower dose is necessary. Hence a replicated field experiment was conducted at five different locations for two consecutive years (2008-09 and 2009-10). Two sprays each of the new molecules fenazaquin 10EC 1.5ml/l, diafenthiuran 50WP 1.2gm/l and propargite 57EC 0.5ml/l were compared with wettable sulphur 80% WDG 2.5gm/l, dicofol 20EC 2.5ml/l, Azadirachtin1300 ppm 0.03% 3ml/l and untreated control. Pooled results showed that five days after spray, all the treatments recorded significantly less number of mites (per cm^2 leaf) as against control. Propargite and diafenthiuran were on par with each other and were significantly superior over dicofol and wettable sulphur by registering the lowest number of mites. Fenazaquin was on par with dicofol and wettable sulphur with less number of mites. However the botanical Azadirachtin recorded maximium number of mites. Results suggested that the new molecules propargite 57EC 0.5ml/l or diafenthiuran 50WP 1.2gm/l can be used for effective management of mites in arecanut. Further, fenazaquin 10EC 1.5ml/l can also be used as an alternative to existing conventional insecticides.

KEY WORDS: Arecanut, *Raoiella indica,* population, Diafenthiuron, Azadirachtin.

INTRODUCTION

The arecanut palm, *Areca catechu* L. (Palmae) is the source of arecanut commonly referred as betelnut or supari in India. Since from time memorial, it is being used in masticatory (chewing), religious and social ceremonies (Murthy 1968), Arecanut is largely cultivated in the plains and foothills of Western Ghats and north eastern regions of India. Area and production in different states indicate that Karnataka, Kerala and Assam account for over 90 per cent. Less labour intensive and good price in the last two decades forced the farmers to cultivate the crop with improved varieties in changed agro-climatic conditions. Although arecanut has been an important commercial crop, due to lack of scientific knowledge and ignorance by the cultivators on agronomic aspects, Pest and diseases, considerable crop losses were encountered in fields. An array of insect and non- insect pests infests all parts of the palm *viz.,* stem, leaves, inflorescence, roots and nuts in one or other stage of the crop growth. As many as 102 insect and non-insect pests have been reported to be associated with arecanut palm (Nair and Daniel 1982). Among them mites are the serious pests in young areca plantation on leaves which are active after the onset of hot weather (Patel & Rao 1958). The two major species of foliage feeding mites are the Cholam mite/white mite, *Oligonychus indicus* and the palm mite/ red mite, *Raoiella indicia* Hirst. Both nymphs and adults of *R. indica* lives in colonies on lower surface of leaves by desapping leading to the formation of yellowish speckles on the lamina which later coalesces, become bronze coloured and the leaves wither away. Suggested chemicals against foliage mites *viz.,* wettable sulphur (Bhat et al. 1957, Puttarudriah and channabasavanna 1957) and dicofol, dimethoate and phosphamidon (Devasahayam and Nair 1985) are in vogue needs to be replaced with safe and efficient molecules.

MATERIALS AND METHODS

A multi location field trial in three districts (five locations) was conducted for two consecutive seasons during 2008-09 to 2009-10 in randomized block design with seven treatments and three replications. Seven treatments replicated thrice were as follows.

1) Wettable sulphur 80WDG 2.5 g/l,
2) Azadirachtin 1300 ppm 0.03 % 3 ml/l,
3) Fenazaquin 10 EC 1.5 ml/l,
4) Diafenthiuron 50 WP 1.2 g/l
5) Propargite 57 EC 0.5 ml/l),
6) Dicofol 20EC 2.5 ml/l and
7) Control. Two insecticidal sprays were given at an interval of 15 days. The spray fluid was applied to the lower surface of leaves at the rate of 500 liters per hectare with a knapsack sprayer. Ten plants were randomly selected in each plot by tying with luggage labels. A day before spraying *ie.,* pretreatmental count (PTC) and 5days after treatment, observations on number of mites/cm^2 on top, bottom and middle leaves of selected plants were recorded. The efficacy was computed as reduction in number of mites compared to control. The data on the

(average of top, bottom and middle leaf of each plant) mean of three replications were considered for statistical analysis after square toot transformation.

RESULTS AND DISCUSSION

The results with respect to mite population (Table 1) were significant indicating differential efficacy of the treatments imposed. Pooled data of two years in all the locations showed significant treatment differences for number of mites/cm^2 leaf/plant. Least number(1. 30 and 1.32 mites/cm^{2}leaf/plant) mites were observed in IInd spray on the areca palm treated with diafenthiuron and propargite respectively and are significantly superior over rest of the treatments. The level of mite population in standard check dicofol (1.47 mites/cm^2 leaf/plant) was on par with fenazaqin and wettable sulphur (1.43 and 1.55 mites/cm^2 leaf/plant, respectively). However the plant based azadirachtin displayed moderate level of control (2.22 mites/cm^{2}leaf/plant) and was significantly different from the unsprayed control which recorded the highest population of 3.10 mites/cm^2 leaf/plant.

TABLE1. Response of arecanut mites to different insecticidal sprays

Sl No	Treatments	Number of mites per cm^2 leaf in a plant								
		PTC			5 DAT					
					I			II		
		2008	2009	pooled	2008	2009	pooled	2008	2009	pooled
1	Wettable Sulphur 2.5 g/l	9.06 (3.06) *	9.13 (3.15)	9.09 (3.09)	4.07 (2.03)	4.2 (2.19)	4.14 (2.15)	1.9 (1.88)	1.9 (1.84)	1.9 (1.55)
2	Azadaractin 0.03% 4ml/l	9.12 (3.18)	9.10 (3.14)	9.13 (3.17)	4.12 (2.28)	4.21 (2.35)	4.15 (2.16)	4.1 (2.16)	4.6 (2.10)	4.31 (2.22)
3	Fenazaquin 10 EC 1.5 ml/l	9.06 (3.09)	9.13 (3.15)	9.07 (3.17)	1.20 (1.77)	1.2 (1.73)	1.20 (1.30)	1.5 (1.64)	1.6 (1.59)	1.52 (1.43)
4	Diafenthiuron 50 WP 1.2 g/l	9.06 (3.01)	9.10 (3.12)	9.09 (3.09)	1.01 (1.19)	1.43 (1.40)	1.21 (1.33)	1.02 (0.99)	1.3 (1.6)	1.13 (1.30)
5	Propargite 57 EC 0.5ml/l	9.13 (3.12)	9.13 (3.15)	9.13 (3.10)	1.10 (1.29)	1.43 (1.43)	1.25 (1.34)	1.0 (1.18)	1.4 (1.33)	1.2 (1.32)
6	Dicofol 20 EC 2.5 ml/l	9.2 (3.27)	9.2 (3.18)	9.2 (3.12)	1.4 (1.97)	1.50 (1.89)	1.43 (1.40)	1.6 (1.89)	1.7 (1.93)	1.61 (1.47)
7	Control	9.30 (3.28)	9.21 (3.17)	9.26 (3.11)	9.06 (3.06)	9.8 (3.0)	9.03 (3.17)	9.40 (3.39)	9.02 (3.01)	9.21 (3.10)
	CV (%)	6.5	2.50	0.15	13.74	13.33	1.91	5.81	17.34	2.42
	CD @ 5%	0.31	0.12	0.01	0.40	0.40	0.06	0.16	0.48	0.08

PTC= Pretreatment count, **DAT**= Days after treatment

***** Figures are √x+0.5 transformed values.

The reduction in mite population was due to the efficacy of newer molecules *viz.,* diafenthiuron, propargite and fenazaquin which are target oriented. Literature on these molecules against scarlet mite was meager. However, minimum population of mites observed in present findings in dicofol and wettable sulphur treated plots were in confirmation with the results reported earlier by Bhat *et al.* 1957, Puttarudriah and Channabasavanna 1957, Kanth *et al.* 1963, Ponnuswamy 1966, Anonymous.1967and Devasahayam and Nair 1985.

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