Madras Agric. J., 98 (7-9): 263-265, September 2011
https://doi.org/10.29321/MAJ.10.100292

Short Note

Laboratory Evaluation of Profenofos 50 EC and Abamectin 1.8 EC against Coconut Eriophyid Mite

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Efficacy of profenofos 50 EC and abamectin 1.8 EC with different doses were tested against coconut eriophyid mite through button dip and bunch peduncle dip methods in the laboratory. In button dip, Abamectin 0.0144 per cent recorded 99.6 per cent reduction of mite population over control while the higher dose of profenofos 0.2 per cent (4 ml/litre) and monocrotophos 0.108 per cent (3 ml/litre) recorded a mean mite population of 11.63 and 12.61 mites/4 sq.mm respectively and were on par. In the peduncle dip method also, abamectin 0.0144 per cent effected a reduction of 80.06 per cent over control and was found effective than other chemicals evaluated.

Keywords: Insecticides, coconut, mite population, Bunch dip, button dip.

India is third largest coconut producing country. Presently, the crop covers an area of 1.9 million hectares with an estimated production of 12.8 billion nuts per annum, which accounts for about 22.36% of the world production. The eriophyid mite, *Aceria guerreronis* Keifer belonging to family Eriophyidae was unknown in Indian subcontinent till 1984, when it was first recorded from Srivilliputhur area of Tamil Nadu. In India, the mite attained a major pest status in the three peninsular states of India *viz*., Kerala, Karnataka and Tamil Nadu and it was spreading towards north also (Sathiamma *et al.,* 1998). It drew national attention as a threat to the coconut plantation (Sathiamma *et al.,* 1998 and Mohana Sundaram *et al.,* 1999). Considering the importance of coconut as a plantation crop in the country and the potential of this mite to cause extensive damage to the coconut crop, a laboratory experiment was conducted at Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore to study the effect of profenofos 50 EC and abamectin 1.8 EC.

Material and Methods

Button dip method

Four/five months old mite infested bunches exhibiting symptoms of damage and harbouring mites on the inner side of the tepals were collected from eight years old local hybrid palms. The experiment was conducted at room temperature (25 - 28°C and 70 - 80% RH) in a completely randomized block design with three replications with eight treatments consisting of doses of profenofos 50 EC and abamectin 1.8 EC along with control (Table 1).

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Nine buttons were used in each treatment and grouped into three sets of replication. The buttons were immersed or dipped in the test solution for 10 seconds and shade dried for few minutes. Later, they were kept in a plastic tray containing moist sand bed. Three buttons were drawn at random from each treatment and observations were made on the number of live mites on 1, 3 and 7 days after treatment.

Bunch peduncle dip method

Four/five months old mite infested bunches were collected from the unsprayed palms of TNAU farm. Bunches with a minimum of nine buttons were used for the experiment. The test solutions were prepared in 500 ml plastic beakers and the cut ends of bunches (peduncle) were immersed into the insecticidal solution. The experimental set up was left as such without disturbance. The treatment details and observation methodology were same as that of the button dip method.

Results and Discussion

Button dip method

Abamectin 0.0144 per cent (8 ml/litre) was the most effective with a mean population reduction of 99.6 per cent over control upto 7 days after treatment (DAT). The mite population was 0.4, 0.0 and 0.0 per 4 sq. mm at 1, 3 and 7 DAT respectively, in abamectin 0.0144 per cent. This was followed by abamectin 0.0072 per cent (4.0 ml/litre), which recorded a population of 1.7, 2.8, 3.3 /4sq.mm at 1,3 and 7 DAT, respectively.

Abamectin 0.0036 per cent (2 ml/litre) registered a mean population of 3.7/4 sq.mm after 7 DAT. The

Table 1. Efficacy of profenofos 50 EC and abamectin 1.8 EC against coconut eriophyid mite

Treatment	Mite (No./4 sq.mm) - DAT(Button dip)				Per cent reduction over control	Mite (No./4 sq.mm) - DAT(Peduncle dip)				Per cent reduction over control
	1	3	7	Mean		1	3	7	Mean	
Profenofos 50 EC 0.05%	12.6hijk	15.9hjklm	23.4m	17.3e	49.3	23.1n	18.5m	15.8k	19.1g	44.2
	(3.6)	(4.0)	(4.8)	(4.2)		(4.9)	(4.3)	(4.0)	(4.4)	
Profenofos 50 EC 0.1%	8.7fghi	15.1jkl	19.2klm	14.3de	58.0	18.8m	16.4kl	13.5ij	16.2f	52.6
	(3.0)	(3.9)	(4.4)	(3.8)		(4.5)	(4.1)	(3.9)	(4.1)	
Profenofos 50 EC 0.2%	6.8cdefg	11.4ghij	16.7jklm	11.6d	65.9	16.5kl	13.8hij	12.4	14.2e	58.5
	(2.7)	(3.4)	(4.1)	(3.4)		(4.1)	(3.8)	(3.6)	(3.8)	
Abamectin 1.8 EC 0.0018%	3.2cde	4.9cdef	6.6defg	4.9c	85.6	14.8ij	12.8fgh	12.0efg	13.1d	61.7
	(1.93	(2.3)	(2.66)	(2.3)		(3.9)	(3.6)	(3.5)	(3.7)	
Abamectin 1.8 EC 0.0036%	3.2cde	3.5cde	4.4cdef	3.7bc	89.1	13.0gh	11.1e	9.6df	11.2c	67.3
	(1.9)	(2.0)	(2.2)	(2.0)		(3.7)	(3.4)	(3.2)	(3.42)	
Abamectin 1.8 EC 0.0072%	1.7abc	2.81bcd	3.3cde	2.6b	92.4	12.0efg	8.4c	6.1b	8.8b	74.2
	(1.5)	(1.8)	(1.9)	(1.7)		(3.54)	(3.0)	(2.5)	(3.0)	
Abamectin 1.8 EC 0.0144%	0.4ab	0.0a	0.0a	0.1a	99.6	10.1cd	6.35b	4.0a	6.8a	80.1
	(1.0)	(0.7)	(0.7)	(0.7)		(3.1)	(2.55)	(2.1)	(2.6)	
Monocrotophos 36 SL 0.108%	7.2efgh	13.4ijkl	17.2jklm	12.6d	63.1	16.8l	14.3i	12.8fgh	14.6e	57.5
	(2.8)	(3.7)	(4.2)	(3.6)		(4.1)	(3.8)	(3.6)	(3.9)	
Control	34.6n	25.4lm	42.4n	34.1f	-	30.4o	34.2p	38.4q	34.3h	-
	(5.9)	(4.5)	(6.5)	(5.7)		(5.6)	(5.9)	(6.2)	(5.9)	
Mean	8.7a	10.3a	14.8b	11.2	-	17.3c	15.1b	13.8a	15.4	-
	(2.7)	(2.9)	(3.5)	(3.0)		(4.1)	(3.8)	(3.6)	(3.8)	

	SEd	CD (P-0.05)	CD (P = 0.01)		SEd	CD (P-0.05)	CD (P = 0.01)
Treatment	0.026	0.524	0.698	Treatment	0.043	0.115	0.086
Days	0.150	0.303	0.403	Days	0.024	0.066	0.049
Treatment days	0.453	0.908	0.403	Treatment days	0.074	0.199	0.149

Means followed by the common letter(s) are not significantly different at 5% level by LSD

DAT - Days after treatment Figures in parentheses are $\overline{x+0.5}$ transformed

higher dose of profenofos 0.2 per cent (4 ml/litre) and monocrotophos 0.108 per cent (3 ml/litre) recorded a mean mite population of 11.6 and 12.6 mites/4 sq.mm respectively and were on par. The lower doses of profenofos 0.1 per cent (2 ml) and 0.05 per cent (1 ml/litre) were comparatively less effective by recording a mean mite population of 14.3 and 17.3 mites/4 sq.mm respectively, and they were on par with the higher dose of profenofos. A significant increase in mite population was noticed as the days progressed (8.7, 10.3 and 14.8/4 sq.mm 1, 3 and 7 DAT respectively) (Table 1). It was inferred that the reduction in population was more on 1 DAT and declined thereafter.

Bunch peduncle dip method

Abamectin 0.0144 per cent effected a maximum mean population reduction of 80.1 per cent at 7 DAT. This was followed by abamectin 0.0072 per cent (74.2%) and abamectin 0.0036 per cent (67.3%). Among the profenofos doses tested, the higher dose 0.2 per cent was found to be the most effective treatment by recording a mean per cent reduction of 58. 5 and it was on par with standard check monocrotophos 0.108 per cent (57.5%). The lower doses of profenofos (0.1 and 0.05%) were comparatively less effective by recording a mean per cent reduction of 52.6 and 44.2, respectively (Table 1). Puspha and Nandihalli (2010) reported Fenazaquin 10EC reduced the population of coconut mite by 31 per cent in button dip method. Karuppuchamy *et al.* (2001) also found that profenofos 0.25 per cent reduced the mite population to an extent of 61.59 per cent over control and monocrotophos 0.18 per cent (5 ml/lit) reduced the population to an extent of 77.50 per cent after two rounds of spot application. Ramaraju *et al.* (2000) reported that monocrotophos (0.05%) (1.5 ml/litre) caused 57.98 per cent mortality of mite population. Natarajan *et al.* (2002) reported monocrotophos 36 SL 1.5 ml/l was found to significantly reduce mite population and root feeding of monocrotophos 15 ml + 15 ml water was effective. Abamectin has been reported to be active even at lower concentrations (Croft *et al.,* 1987).

Greater efficacy of abamectin in reducing the mite population has been recorded in all doses. This may be due to its mode of action (GABA - agonist) and the translaminar activity which provides residual activity against the feeding mites. The plant physiological conditions also has possible influence

in the efficacy of abamectin, the thickness of cuticle in the senescing leaves impose the translaminar movement of abamectin in the late growing season. Under these complex conditions to achieve maximum control, the treatments should be applied over a long period.

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Received: March 5, 2011; Accepted: August 19, 2011