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Insecticidal Control of the Betelvine Scale Insect, *Lepidosaphes cornutus* Ramakrishna in Tamil Nadu

by

G. BALASUBRAMANIAN[1], L. N. THIAGARAJAN[2] and T. SANTHANARAMAN[3]

Introduction: Betelvine (*Piper betel*) is being grown in an area of about 16,000 acres in Tamil Nadu and is considered to be one of the most economic narcotic crops. This crop is subjected to the attack by a number of pests like betelvine bug (*Disphinctus politus* Dist.) scale insects, (*Lepidosaphes cornutus* Ramakrishna and *Aonoidella* spp. *Cyclopelta siccifolia* W., *Aleurocanthus* (Aleyrodoes) *nibulans*) and a nematode parasite, *Meloidogyne incognita* var. *acrita*. Among them, the betelvine scale, *Lepidosaphes cornutus* is important. It attacks the main vine, petiole and lamina and reduces the vitality of the crop by sucking plant sap. The infested leaves show cupping, crinkling, chlorosis and then eventually wilt and dry off. The scale insect can be recognised by its shiny yellow colour and boat shaped appearance. To evolve a suitable control measure against this pest, three insecticidal trials were conducted during 1966–68 and the results are presented in this paper.

Materials and Methods: Three insecticidal trials were laid out against these scales at Thottiyam and Pandamangalam in Tiruchirapalli and Salem Districts in *ryots'* fields during July, 1966, April, 1967 and March, 1968 respectively in a simple randomised block design, replicated thrice. The treatments were (i) Malathion 0.1% plus Fish Oil Rosin Soap (1 lb in 6 gallons), (ii) Malathion 0.1%, (iii) Fish Oil Rosin Soap (1 lb in 6 gallons), (iv) Rogor (Dimethoate) 0.1%, (v) Nuvan (DDVP) 0.1%, (vi) Metasystox (Methyldemeton) 0.1%, (vii) Water spray and (viii) control (untreated). For all the three trials, the same treatments were used and one year old crop was chosen for conducting the trials. Only one round of spraying was given with a hand syringe at the rate of 250 gallons (1125 litres) of spray fluid/ha. Two vines were selected at random for each treatment and for each replication. Counts on the population of coccids were recorded on two leaves marked per vine, one in the middle and the other at the bottom on both the surfaces of leaves before and 72 hours and 10 days after treatment to assess the efficacy of different treatments. The shiny, yellowish live scales had turned into dark brown colour and shrivelled when dead. Counts were taken 72 hours after spraying with the aid of a magnifying lens. The coccids were removed with a fine-needle and observed under the dissection microscope for the dead and live scales 10 days after treatment.

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1 and 2. Assistants in Entomology and 3. Entomologist and Associate Professor of Entomology, Agricultural College and Research Institute, Coimbatore.

Results and Discussion: The data on the percentage of reduction in infestation of scales were subjected to statistical analysis and found to be highly significant and the results are furnished in Tables 1 and 2. The pooled analysis of the data on the infestation in reduction of three trials, 72 hours after treatment shows that Dimethoate 0.1%, is highly superior to other treatments followed by Malathion 0.1% and Malathion 0.1% plus Fish oil Rosin Soap (1 lb in 6 gallons) are on a par to keep the pest under check. The treatments Dichlorvas 0.1% and Fish oil Rosin soap (1 lb in 6 gallons) are also on a par to control this scale insect. The weighted pooled analysis of the data on the infestation in reduction of the three trials 10 days after treatment reveals that Malathion 0.1% plus Fish Oil Rosin Soap (1 lb, in 6 gallons) reduces the maximum population of scales followed by Rogor (Dimethoate) 0.1% and Malathion 0 1% which are on a par. The rest of the three treatments are again on par with Nuvan (DDVP) 0.1% spray. All the insecticidal treatments show appreciable reduction of scales when compared to water spray and untreated control.

The first incidence of this scale insect was recorded at Thirukoilur in South Arcot district by Ramachandran and Ayyar in 1934 and subsequently at Thirukullam in North Arcot District by Ayyar in 1936. Again this insect was observed to be in a pest form causing severe damage to betelvine farms in Rajagiri of Tanjore District by Subramaniam *et al*, in 1960 and they reported pyrocolloid spray (1 in 300) to control the scale to an appreciable extent. In 1965, Muthukrishnan and Gopalan conducted an observational trial at Vedichipalayam of Thiruchirapalli district for the control of this pest and recommended spraying of Malathion 0.25% plus Fish Oil Rosin Soap (1 lb in 25 gallons of water) which is in conformity with the findings of the present three trials.

In conclusion even though the chemicals, Malathion 0.1% plus Fish Oil Rosin Soap, Rogor (Dimethoate) 0.1% and Malathion 0.1% spray were found to be equally efficacious in controlling the pest considering the safety as well as the cost, malathion 0.1% spray above is preferable and the cost of spray in malathion works out to Rs. 31.50 for treating one hectare of crop. Since the betelvine crop is cultivated mainly for its leaf which is used for chewing purposes, it is necessary to use the safest chemical. Hence, Malathion 0.1% spray can be economically recommended for the control of betelvine scale insect.

Summary: A total of three field trials were conducted against the betelvine scale insect, *Lepidosaphes cornuta* and the results revealed that Malathion 0.1%, Malathion 0.1% plus Fish Oil Rosin Soap (1 lb in 6 gallons) and Rogor (Dimethoate) 0.1% were effective in controlling

TABLE 1. *Mean percentage of reduction of population of insect, Lepidosaphes cornutus 72 hours after treatment*

S. No.	Insecticides	Place where trials were conducted							
		Thottiyam 1966		Pandamangalam 1967		Pandamangalam 1968		Pooled analysis	
		Mean % of reduction in infestation	T.V.	Mean of % reduction in infestation	T.V.	Mean % of reduction in infestation	T.V.	Mean % of reduction in infestation	T.V.
1.	Malathion 0.1% plus Fish Oil Rosin Soap (1 lb in 6 gallons)	51.1	(45.6)	85.8	(67.86)	78.6	(62.4)	72.9	(58.6)
2.	Malathion 0.1%	55.3	(48.0)	62.8	(52.4)	77.4	(61.6)	65.5	(54.0)
3.	Fish Oil Rosin Soap (1 lb in 6 gallons)	27.0	(31.3)	30.0	(33.2)	80.8	(64.0)	46.2	(42.8)
4.	Rogor (Dimethoate) 0.1%	100.0	(90.0)	88.3	(70.0)	65.3	(53.9)	59.8	(71.3)
5.	Nuvan (Dichlorvas) 0.1%	81.2	(64.3)	57.3	(37.6)	49.5	(44.7)	56.8	(48.9)
6.	Metasystox (Methyl demeton) 0.1%	34.6	(36.0)	6.5	(14.7)	47.2	(43.4)	27.5	(31.6)
7.	Water spray	1.3	(6.6)	0.7	(4.8)	0.5	(4.05)	0.8	(5.1)
8.	Control	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	S.E. of Mean	5.52		5.25		3.5		2.59	
	C.D.	16.80		15.89		10.6		7.4	
	Significance	Yes		Yes		Yes		Yes	
	Conclusion	4, 5, 2, 1, 6, 3, 7, 8,		4, 1, 2, 5, 3, 6, 7, 8,		3, 1, 2, 4, 5, 6, 7, 8		4, 1, 2, 5, 3, 6, 7, 8	

TABLE 2. *Mean percentage of reduction of population of scale insect, Lepidosaphes cornutus 10 days after treatment*

S. No.	Insecticides	Place where trials were conducted								Cost of chemical per hectare
		Thottiyam 1966		Pandamangalam 1967		Pandamangalam 1968		Pooled analysis		
		Mean % of reduction in infestation	T.V.	Mean % of reduction in infestation	T.V.	Mean % of reduction in infestation	T.V.	Mean % of reduction in infestation	T.V.	
1.	Malathion 0.1% plus Fish Oil Rosin Soap (1 lb in 6 gallons)	100.00	(90.00)	96.53	(81.41)	99.30	(87.20)	99.60	(86.20)	54.28
2.	Malathion 0.1%	96.98	(81.30)	95.62	(78.31)	98.38	(84.00)	97.7	(81.20)	31.50
3.	Fish Oil Rosin Soap (1 lb in 6 gallons)	52.48	(41.90)	39.51	(38.56)	93.71	(75.20)	60.8	(51.20)	22.78
4.	Rogor (Dimethoate) 0.1%	100.00	(90.00)	98.26	(83.36)	96.70	(80.00)	99.2	(84.62)	93.61
5.	Nuvan (DDVP) 0.1%	93.85	(75.83)	57.52	(49.38)	79.09	(63.50)	79.2	(62.90)	204.85
6.	Metasystox 0.1% (Myihyl dometon)	66.23	(52.13)	36.72	(35.74)	68.89	(56.30)	55.3	(48.06)	40.73
7.	Water spray	33.92	(30.77)	Nil	Nil	2.18	(4.90)	4.2	(11.89)	—
8.	Control	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	...
	S.E. of Mean	....	5.90	....	7.90	....	3.42	5.42	....	....
	C.D.	....	17.89	....	23.96	....	10.38	16.44	....	....
	Significance	Yes		Yes		Yes		Yes		
	Conclusion	1, 4, 2, 5, 6, 3, 7, 8,		4, 1, 2, 5, 3, 6, 7, 8,		1, 2, 4, 3, 5, 6, 7, 8,		1, 4, 2, 5, 3, 6, 7, 8,		

the pest. But considering the mammalian toxicity and cost of the chemical, Malathion 0.1% spray only can be advantageously recommended for the effective control of this scale insect.

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CO 1 Pumpkin - A High Yielding Improved Strain

by

S. KAMALANATHAN[1] and S. THAMBURAJ[2]

Introduction : Pumkin (*Cucurbita moschata* Poir.) is one of the important vegetable crops of Tamil Nadu. It is valued mostly as a vegetable and is also used as a main ingredient in the preparation of sweet-meats, thus providing opportunities for processing and canning industries. Yet, there has been so far no improved strain in pumpkin for cultivation in Tamil Nadu Breeding projects were, therefore, undertaken at Agricultural College and Research Institute, Coimbatore for evolving an improved strain of pumpkin combining high yield, better fruit quality and desirable agronomic characters and the results are presented.

Materials and Methods : Thiry one types of pumpkin were collected from all over the country and studied in detail, in an initial evaluation trial, for their yield potential, quality and morphological characters. Selections were exercised in varieties which showed variations. Sixteen types, which appeared to be better among them, were selected and further tested for three seasons at Coimbatore under yield trials, eliminating in each season the poor performers based on yield of fruits, both in terms of number and weight (per plant as well as per hectare), days required for first staminate and pistillate flowering and node numbers on which they appeared, sex ratio of staminate to pistillate flowers and the total crop period. Five varieties were finally selected and tested for three seasons in eight Agricultural Research Stations and 32

1. Crop Specialist (Vegetables) and 2. Research Assistant, Agricultural College and Research Institute, Coimbatore.