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Evaluation of Plant Material, Plant Products, and Oil Cakes Against Arecanut White Grub *Leucopholis burmeisteri* Brenske (Coleoptera : Scarabaeidae : Melolonthinae)

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Leucopholis burmeisteri Brenske (Coloptera : Scarabaeidae : Melolonthinae) is one of the major pests of arecanut palm in Karnataka and Kerala States (Mariamma Daniel and Premkumar, 1976). The grubs, commonly known as 'white grubs' or 'root grubs' feed on the young growing roots, and continue feeding for two or more years resulting in yellowing of the leaves, tapering of the stem and reduction in number of spathes produced by the palm (Rajamoni and Nambiar, 1970). These grubs also feed on the roots of intercrops in arecanut gardens like tapioca and banana plants (Veeresh *et al.*, 1985). Soil application of contact and systemic insecticides are presently recommended for control. Prolonged application of soil insecticides has a deleterious effect on the other fauna and flora of the soil and is not economical. Plant products have a better interaction with the soil and apparently have no side effects. Neem cake and pongamia cakes tried as soil treatments gave maximum reduction in the grub population (Premkumar and Mariamma Daniel, 1981). An attempt was made to evaluate some of the commonly available non-edible oil cakes like neem, karanj and mahua; plant and plant products like vitex leaves, vitoxyl 2%, Nimbecidine 2% and Achook 2% for the management of arecanut root grubs.

The trial was carried out at the Regional Station of Central Plantation Crops Research Institute located at Vittal, Karnataka State during 1992-93. Commercially available oil cakes like neem, pongamia and mahua, *Madhuca indica* J.F. Gmel. Were applied at the rate of 8.5, 19.0, 34 and 53 g per pot equivalent to 1000, 1500, 2000, 2500 kg per ha respectively. The trial was replicated four times with 10 third instar grubs of *L. burmeisteri* per replication. The grubs were contained in 28 cm diameter earthern garden pots containing sterilized soil and provided with two-year-old seedlings. Oil cakes were powdered and applied and enough soil moisture was maintained in the pots.

A second experiment was laid out in 1993-94 having the following treatments viz: Vitoxyl 2%. Nimbecidine 2% and Achook 2%, 250 ml solution applied per pot, and 85 g per pot of fresh leaves, dried leaves and dried and powdered leaves of *Vitex negundo*. Second instar grubs were used in this experiment. The grub mortality were recorded after 30 days of application of oil cakes, plant products and plant materials. The data were analysed statistically.

Grub mortality in the experiment with oil cakes of neem, karanj and mahua, indicated karanj oil cake to be significantly better than the others. Mortality was higher in karanj followed by neem. The lowest dose of 19 g of karanj gave higher mortality of grubs when compared to the three doses of neem and mahua cakes (Table 1). This confirmed the results of field trials with pongamia and neem oil cakes reported earlier (Premkumar and Mariamma Daniel, 1981).

The results of the experiment with plant and plant products against second instar grubs of *L. burmeisteri* showed higher grub mortality with dry leaf powder of *V. negundo* followed by Achook 2% (Table 2).

Application of plant products could be one of the methods in the IPM of arecanut white grub, the other components being adult beetle collection and destruction, proper cultivation practices and use of bio-control agents.

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Table 1. Evaluation of oil cakes against third instar grubs *L. Burmeisteri*

Treatment	Dosage per pot	Per cent mortality
Neem cake	8.5 g	31.13 (33.89)
Neem cake	19.0 g	35.63 (36.62)
Neem cake	34.0 g	36.93 (37.44)
Neem cake	53.0 g	38.82 (38.55)
Mahua cake	8.5 g	25.86 (30.57)
Mahua cake	19.0 g	27.96 (31.86)
Mahua cake	34.0 g	29.53 (32.93)
Mahua cake	53.0 g	33.73 (35.50)
Karanj cake	8.5 g	39.12 (38.70)
Karanj cake	19.0 g	42.61 (40.75)
Karanj cake	34.0 g	46.01 (42.72)
Karanj cake	53.0 g	49.52 (44.75)
Control		5.50 (12.08)
C.D. (P = 0.05)		4.90

* Value in parentheses are transformed values

Table 2. Evaluation of products against second instar grubs L. *Burmeisteri*

Treatment	Per cent mortality	
Vitoxyl 2%	10.0	(18.44)
Nimbecidine 2%	10.0	(18.44)
Achook 2%	43.3	(41.2)
* *Vitex negundo* (fresh leaves)	20.0	(26.6)
* *V. negundo* (dry leaves)	40.0	(39.3)
* *V. negundo* (dried leaf powder)	60.0	(50.8)
Control	10.0	(12.3)
L.S.D. (P = 0.05)	7.32	

* Value in parentheses are transformed values