NOTES

APPLICATION OF SOME SYSTEMIC INSECTICIDES AGAINST THE WEEVIL *MECOBARIS TERMINALAE* (COLEOPTERA: CURCULIONIDAE), A SEED BORER OF *TERMINALIA BELLIRICA*

P. B. Meshram

Centre for Forestry Research and Human Resource Development (T.F.R.I.), Chhindwara - 480001 India

Terminalia bellirica seeds are well known commercially as belliric myrobalan. It contains all the components of chebulic myrobalan except corilagin and chebulic acid and can be used as a substitute for myrobalans in tanning. The oil from the kernels can be used in the manufacture of soaps. The kernels possess narcotic properties and are sometimes eaten with betel-nut for the treatment of dyspepsia. The ripe fruits are used as an astringent usually in combination with chebulic myrobalan. When half ripe, the fruit is used as a purgative due to the presence of oil. Extracts of fruit possess antibacterial properties. The oil is also used as a hair tonic. The seeds contain protein from which satisfactory adhesives, both cold-pressed and hot-setting, can be developed. The fruits (without kernels) can be used for the preparation of oxalic acid and ink (Anonymous 1976). The quality and quantity of fruits or seeds obtained from this economically important tree species are adversely affected by attacks of the weevil, *Mecobaris terminalae.* The attacks cause poor seed setting in natural forests (Beeson 1941). The weevils bore into the seeds of *T. bellirica* from January to March, feeding on the interior portion and causing the seeds to become unfit not only for human consumption but also for seed purpose. The losses estimated due to this pest are 80% in Satpura forest areas of Madhya Pradesh, India. Beeson (1941) reported that this weevil bores only into the seeds of *T. bellirica.* To date, no prophylactic treatment has been done to protect the immature fruits or seeds with insecticides.

A field experiment was conducted at Poama, Chhindwara, Madhya Pradesh in the provinces of Central India in 1998–1999. The area was divided into eight treatments with three replications each. Each treatment comprised three trees of equal girth and height, 145 cm and 12.0 m respectively. The eight treatments were Phosphamidon 85 EC, Methyl demeton 25 EC, chlorpyrifos 20 EC, Dimethoate 30 EC, Phorate 10 G, Endosulfan 35 EC, Furadon 3 G and an untreated control. Insecticides solutions were prepared in 10 l of water on weight/weight (w/w) basis of their active ingredient. The 10 l insecticidal solutions were poured into a 15 cm deep trench encircling the base of a tree (approximately 0.2 m^2 area). During every application pretreatment observations with respect to attack or damaged fruits or seeds were recorded. Similar observations were also taken after harvesting of seeds. Seeds were plucked and collected randomly in January to March. The percentage of damaged seeds was calculated at this time and weighed at an interval of 30 days for each replication of the treatments. The percentage was based on the number of damaged seeds in one kilogram of seeds divided by the total number of seeds and multiplied by 100. The percentage of sound seeds after 30 days of treatment was transformed into angle and analysed statistically (Snedecor 1950).

Received May 1999

The percentage of sound seeds produced showed that all the insecticide treatments were significantly superior to the untreated control (Table 1). Phorate 10 G proved to be the most effective by producing an average of 81.76% sound seeds followed by Dimethoate 30 EC (66.85%). Treatment by chlorpyrifos produced 58.48% sound seeds. Endosulfan, Phosphamidon, Furadon and Methyl demeton were less effective in killing weevils and the mean percentages of sound seeds produced were 45.31, 42.27, 34.59 and 34.45% respectively. Only 22.78% undamaged seeds were recorded in the control. The differences among means were highly significant at the 0.05 probability level. Almost all the treatments were significantly different from the control. Ven Buijtenen (1981) reported good results in using Furadon for control of *Dioryctria* species that attack cones of southern pine (in USA). However, in this study Furadon was less effective against weevil.

As a conclusion, we recommend that Phorate 10 G, followed by Dimethoate 30 EC, should be applied when seeds of *T. bellirica* are still immature as a prophylactic treatment. To obtain maximum number of seeds, application of these systemic insecticides should be repeated 30 days after the initial application.

Table 1 Effectiveness of some insecticides against *Mecobaris terminalae*, a seed borer of *Terminalia bellirica*

Treatment	% of sound seeds produced after treatment				
	January	February	March	April	Mean
Phosphamidon 85 EC	46.34 (42.90)	56.00 (48.47)	35.34 (36.45)	31.42 (34.28)	42.27 (38.80)
Methyl demeton 25 EC	36.00 (36.89)	40.61 (39.58)	30.57 (33.96)	30.36 (33.56)	34.45 (35.78)
Chlorpyrifos 20 EC	54.32 (47.58)	65.18 (53.83)	44.53 (41.84)	69.90 (51.87)	58.48 (48.78)
Dimethoate 30 EC	59.15 (50.26)	80.25 (63.61)	55.00 (47.87)	73.00 (58.66)	66.85 (55.10)
Phorate 10 G	81.35 (64.41)	84.37 (66.51)	66.67 (54.74)	94.66 (76.19)	81.76 (72.30)
Endosulfan 35 EC	54.26 (47.43)	44.60 (41.88)	34.16 (35.75)	48.23 (43 97)	45.31 (42.23)
Furadon 3 G	32.49 (34 74)	42.77 (40.84)	32.13 (34.51)	31.00 (33.83)	34.59 (35.98)
Control (Untreated)	24.37 (29.80)	26.58 (31.03)	22.40 (26.21)	17.78 (24.91)	22.78 (28.48)
SEM (±)	4.48	4.27	1.47	6.03	3.70
CD	0.96	9.16	3.15	1.29	7.71

Data in parentheses are angular transformed values.
SEM = Standard error mean
CD = Critical difference at 0.05 probability level

Acknowledgement

The author is grateful to S. K. Banerjee for providing the necessary facilities.

References

ANONYMOUS. 1976. *The Wealth of India: Raw Materials.* Volume 10. CSIR, New Delhi. 551 pp.

BEESON, C. F. C. 1941. *The Ecology and Control of Forest Insects of India and Neighbouring Countries.* Vasant Press, Dehra Dun. 1007 pp.

SNEDECOR, G. W. 1950. *Statistical Methods.* The Iowa State College Press, Iowa. 485 pp.

VEN BUIJTENEN, J. P. 1981. Insecticides for seed orchards: a case study in applied research. *Southern Journal Applied Forestry* 5(1): 33–37.