

GRANULAR INSECTICIDES FOR THE CONTROL OF OLIVE PSYLLID, *EUPHYLLURA OLIVINA* COSTA

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Abstract. In a field trial six granular insecticides have been tested against olive psyllid (*Euphyllura olivina* Costa) in 20, 25 and 30 g per plant of 60, 150 and 240 cm height. Temik gave 100% kill of nymphs and adults within 3 to 7 days in each height groups of plants. Terracur gave 100% mortality of nymphs in 10-20 days only in the smaller plants. Disyston rated 3rd by giving 96% mortality of nymphs only in highest dose and smaller plants while other insecticides showed no effect against the pest. In check all nymphs survived but 1-6% adults were found dead after a month.

Introduction. Olives being an important source of edible oils are gaining importance for introduction in Pakistan. During the initial budding propagation trials at the Pakistan Forest Institute the plants were found heavily infested by a psyllid (*Euphyllura olivina* Costa). The white waxy patches under which numerous nymphs are busy in desapping the olive shoots is a common eye catching sight from a distance. The cottony coating, mostly on the top shoots and growing buds, keeps swelling and spreading with the increase in psyllid population which results in weakening of the plants some times complete death of the shoots or the whole plants. In bigger trees pest infestation affects fruit bearing capacity adversely. The situation called for an early control of the pest.

Review of literature. Various insecticides have been tried for the control of *Euphyllura olivina* Costa. Rolli (1974) controlled this pest along with *Dacus olea* by using Parathion dust. Tokmakoglu and Celik (1973) reported 70% success with 2% dust of Malathion and 78.4% success with 3% dust of Fenthion (Lebaycid) at the rate of 30 and 40 kg per ha, respectively, against *Euphyllura olivina* in olive groves at Nizip, Gaziantep. Farahbakhch and Moini (1975) have recommended Malathion and Endosulfan (Thiodan) against early stages of *Euphyllura olivina* Costa. Eguagie (1973) suggested soil application or trunk painting with Azodrin and Bidrin for the control of aphids, psyllids, thrips and mealybugs on young Cacao. He also opines that differences in ecology of the pests and their parasites could be exploited in an integrated control programme.

Boling and Dean (1968) conducted a field experiment with Temik 10_G against citrus mites and other insects and found a distinctly smaller population on the trees receiving 50_G of Temik than those receiving 25 or 10_G. Schaefer (1968) tested foliar and soil insecticides against an aphid (*Amphorophora agathonica*) on Raspberry nursery stock and graded granular application better than foliar spray. Of the granules tested, Temik proved con-

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sistently the most effective and provided season-long control of aphids in 2 applications at the rate of 6 lb per acre. Asquith (1968) applied Temik to apple trees and killed 77% European red mites and 30% two spotted mites with a dose of 288 g per tree and 92% European mites and 60.9% two spotted mites with a dose of 576 g per tree. Broadcast application of Temik at 56, 112 and 224 kg per ha and circular application of 22.3, 44.5 and 66.9 g per cm of tree trunk diameter gave complete control of Scotch pine aphid throughout the season (Kearby and Bliss, JR 1969). Nagei et al (1969) carried out insecticide tests to control *Contarina* spp. on Douglas-fir and achieved acceptable control with granular Carbofuran and Temik applied respectively at the rate of 4 lb and 20 lb per acre. Tashiro et al (1969) applied Temik in the soil under the canopy of 2-year old navel orange trees which effectively controlled field populations of the citrus red mite for 44 weeks, the spirea aphids for 29 weeks and the citrus thrips for 10 weeks with 7.5 and 40 g active ingredient per tree. Fruit collected 100 days post treatment contained no poison residues. Asquith (1967) controlled satisfactorily the European red mites, two spotted red mite and the apple aphids with Temik granules on 15-16 year old apple trees. Application of 2 lb per tree of Temik twice caused burning of the margins of some leaves. Stanley and Russell (1967) studied growth responses of flowering crab apple and control of red-banded leaf roller by granular formulations of 7 systemic insecticides including Temik. All insecticides increased growth (height) of the trees but NIA 10242 showed outstanding growth and best control of leaf rollers. To observe residual activity Tashiro and Beavers (1967) applied Temik 10_G to the soil surface of mite infested 1 year old navel and Valencia orange trees. The 12.92 g level produced virtually complete control of mites for 1 full year while 3.23 g per m² began losing its activity at 30 days and 6.46 g level at 45 weeks. Schread (1966) tested UC-21149 (Temik) and NIA 10242 in which the granules gave complete control of birch leaf miner for 2 years and holly leaf miner and Andromeda lace bug during the season. UC-21149 gave somewhat better control of box-wood leaf miner than NIA 10242. Cuentas (1977) studied life history and control of *Metcalfiella pertusa* Germar and found that Disyston 5% granules afforded good control on Cacao in Peru.

Material and method. *Olea europea* plants being raised at the Pakistan Forest Institute, Peshawar for grafting trials were heavily infested by olive psyllid (*Euphyllura olivina*). Six granular insecticides—Temik, Terracur, Disyston, Diphonate, Lorsban and Thiodan were tried in doses of 20, 25 and 30 grams per plant pit on three plant height groups of 60 cm, 150 cm and 240 cm. A pit of 30 cm diameter and 7 cm depth was made around each plant. The soil in each pit was worked and the granular insecticides mixed in it followed by application of ten litres of water in each pit.

Population counts of psyllid nymphs on a 20 cm long twig of each plant were recorded before treatment and each covered over with 30 cm long and 15 cm wide muslin cloth sleeves. Twenty adults of the psyllid were also released on each twig in the cloth sleeves. In order to record mortality due to the insecticidal action of granules the dead nymphs and adults of psyllids found fallen from the twig in the cloth sleeves were counted and removed daily.

Out of the six granular insecticides Temik, Terracur and Disyston proved effective against the pest. Diphonate, Lorsban and Thiodan were ineffective in all doses in each height group of the plants. Of the 3 effective granules, Temik in all doses in each

height group of plants showed activity within 24 hours after treatment and caused 100% mortality of nymphs and adults within 3 to 7 days. Terracur showed activity after 3 days of treatment in 60 and 150 cm height group and brought about 100% kill of nymphs only in 10 to 20 days. 100% mortality of adults occurred in highest dose (30 g) only in 60 cm height group within 20 days. Effectiveness of Disyston was observed after 7 days of treatment only in 60 and 150 cm height groups and 96% nymphs were killed in highest dose (30 g) in 60 cm height group within 30 days. It was ineffective against adults. 1 to 6% adults were found dead in check but no mortality of nymphs when observed on 30th day of treatment. No mortality of predators and parasites was observed.

It may be concluded that psyllids injurious to plants at nursery stage can be effectively controlled by Temik in shortest time without affecting predator—parasite complex or other animal life.

Results and discussion. Efficacy of granular insecticides against olive psyllid, *Euphyllura olivina* Costa is given in a table below:

Insecticides	Doses (grams)	Plant height group (cm)	Percent mortality of nymphs and adults per 20 cm twigs at indicated days after treatment.									
			3		7		10		20		30	
			n	a	n	a	n	a	n	a	n	a
Temik	20	60	100	70	—	100	—	—	—	—	—	—
		150	100	35	—	100	—	—	—	—	—	—
		240	72	30	100	100	—	—	—	—	—	—
	25	60	100	100	—	—	—	—	—	—	—	—
		150	100	40	—	100	—	—	—	—	—	—
		240	80	35	100	100	—	—	—	—	—	—
	30	60	100	100	—	—	—	—	—	—	—	—
		150	100	40	—	100	—	—	—	—	—	—
		240	80	35	100	100	—	—	—	—	—	—
	Check		0	0	0	0	0	0	0	0	0	6
Terracur	20	60	—	—	40	10	100	25	—	70	—	70
		150	—	—	20	5	45	30	100	60	—	65
		240	—	—	—	—	6	5	51	55	61	60
	25	60	—	—	45	30	100	60	—	80	—	85
		150	—	—	18	10	41	30	100	65	—	80
		240	—	—	—	—	13	10	51	50	75	70

Insecti- cides	Doses (grams)	Plant height group (cm)	Percent mortality of nymphs and adults per 20 cm twigs at indicated days after treatment.									
			3		7		10		20		30	
			n	a	n	a	n	a	n	a	n	a
Disyston	30	60	—	—	53	50	100	75	—	100	—	—
		150	—	—	20	15	45	40	100	80	—	90
		240	—	—	—	—	14	15	56	60	90	80
	Check		0	0	0	0	0	0	0	0	0	6
	20	60	—	—	—	—	16	—	83	—	84	—
		150	—	—	—	—	1	—	23	—	31	—
		240	—	—	—	—	—	—	—	—	—	—
	25	60	—	—	—	—	17	—	85	—	88	—
		150	—	—	—	—	4	—	40	—	49	—
		240	—	—	—	—	—	—	—	—	—	—
	30	60	—	—	—	—	20	—	94	—	96	—
		150	—	—	—	—	7	—	42	—	50	—
		240	—	—	—	—	—	—	—	—	—	—
	Check		0	0	0	0	0	0	0	0	0	1
			n — Nymphs		a — Adults							

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