

INSECT PEST CONTROL IN GRAIN AMARANTHUS

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The grain amaranthus which is popularly known as 'Ramdana' is a potential multipurpose tropical and temperate pseudo-cereal crop (Anonymous, 1997). The crop is cultivated for food, fodder, vegetable and ornamental purposes. The crop is widely spread in the entire Himalayas from Kashmir to Bhutan. The crop is highly susceptible to an array of insect pests (Mallory, 1990; Aydam and Burki, 1997). In Orissa *Amaranthus dubius*, *A. tricolor* and *A. tristi* are grown in 1240 ha of land (Jena and Mohanty, 2000, 2001). Use of highly toxic pesticides is strictly prohibited on the crop as its leaves and stems are used as vegetables.

Field studies were carried out at the Central Agricultural Research Station, O.U.A.T., Bhubaneswar during *Rabi* 2000-2001 to find out the effectiveness of some eco-friendly pesticides against the major insect pests infesting grain amaranthus. The details of the experiment and the results are given in the Table 1. All the agronomical practices as per state recommendation were timely followed. The insecticides were applied thrice at 30, 45 and 60 DAT (days after transplanting). Periodical observation at 10 days interval on activities of grasshopper (*Chrotogonus* sp.), flea beetle (*Monolepta signata*), leaf eating caterpillar (*Spodoptera litura*), coreid bug (*Cletus bipunctatus*) and green bug (*Plautia fimbriatus*) were recorded from 42 to 82 DAT. The larvae, pupae and adult populations of *Paralixus brachyrrhinus*, were counted at the time of harvest of the crop. The grain yield (q/ha) was taken into account during the harvest time. All the data were statistically analysed after appropriate transformation (Snedecor and Cochran, 1967).

Data presented in Table 1 revealed that the grasshopper started building its population from 32 DAT and continued up to 82 DAT. The adult population varied from 0.1 to 0.94 on different dates of observation. The effectiveness of pesticides against pest infestation indicated that carbaryl 50 WP proved to be the most promising one in reducing pest damage. The neem product, viz., Centraguard containing Azadirachtin 1500 ppm was the next effective pesticide. The flea beetle appeared on the crop at its 42 days age and continued its activity up to 92 days. Carbaryl followed by malathion minimized the beetle infestation (0.83 % leaf infestation) successfully. The bio-pesticide, viz., SINPV @ 250 LE/ha and malathion suppressed the leaf eating caterpillar (*Spodoptera litura*) damage excellently. Both malathion and endosulfan application followed by Centraguard were quite effective to contain the green bug menace (Table 1). Malathion recorded minimum coreid bug population (0.50 adults/10 plants). Centraguard registered highest grain yield (6.78 q/ha). Other promising pesticides in recording lower pest damage and higher grain yield were malathion (6.48 q/ha), carbaryl (6.27 q/ha) and endosulfan (6.01 q/ha).

Table. 1 Effect of treatments on pest population reduction

Treatments No	Treatments	Dose/ha	Weevil population			Foliage / Inflorescence feeder					Grain yield increase over untreated check (%)
			Reduction over untreated check (%)			Reduction over untreated check (%)					
			Larvae	Pupae	Adults	Grass-hopper population	Flea beetle leaves infested (%)	Leaf eating caterpillar leaves infested (%)	Green bug leaves infested (%)	Coreid bug adults	
T1	Centraguard [Azadirachtin 1500 ppm]	2.5 lit	75.05 [1.33]	42.92 [1.33]	100.00 [0.00]	76.60 [0.22]	42.49 [1.11]	42.78 [1.03]	74.72 [0.45]	74.65 [0.55]	46.75 [6.75]
T2	Halt [Btk] 5 WP	1.5 kg	24.95 [4.00]	0.00 [2.3]	57.05 [1.00]	40.43 [0.56]	10.88 [1.72]	20.00 [1.44]	39.89 [1.07]	41.01 [1.28]	5.63 [4.88]
T3	Malathion 50 EC	0.5kg a.i.	75.05 [1.33]	42.92 [1.33]	85.84 [0.33]	70.21 [0.28]	55.44 [0.86]	55.44 [0.86]	78.09 [0.39]	76.96 [0.50]	40.26 [6.48]
T4	Carbaryl 50-WP	1.0kg a.i.	81.24 [1.00]	57.08 [1.00]	71.67 [0.06]	88.30 [0.11]	56.99 [0.83]	56.99 [0.83]	68.54 [0.56]	69.12 [0.67]	35.71 [6.27]
T5	Endosulfan 35EC	0.75kg a.i.	68.67 [1.67]	42.92 [1.33]	85.84 [0.33]	63.83 [0.34]	41.97 [1.12]	41.97 [1.12]	78.09 [0.39]	61.75 [0.83]	30.09 [6.01]
T6	SINPV	250 LE	43.71 [3.00]	14.16 [2.00]	57.08 [1.00]	78.72 [0.67]	6.74 [1.80]	6.74 [1.80]	46.63 [0.95]	30.88 [1.50]	7.58 [4.97]
T7	Untreated check	-	[5.33]	[2.33]	[2.33]	[0.94]	[1.93]	[1.93]	[1.78]	[2.17]	[4.62]
Mean	-	-	[2.52]	[1.66]	[0.80]	-	-	-	-	-	[5.72]
C.D.[0.05]	-	-	[0.35]	[0.43]	[0.55]	-	-	-	-	-	[0.80]

* Mean of observations

Figures in parentheses indicate transformed mean values (are $\sin \sqrt{\%}$)

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