

CHEMICAL CONTROL OF VEGETABLE LEAFMINER DAMAGING
SUNFLOWER SEEDLING IN JILIN PROVINCE, CHINA

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Abstract

Vegetable leafminer, *Phytomyza horticola* Goureau, which is one of the most important sunflower seedling pests, can bring about serious damage on the sunflower seedlings. The trials of the chemical control for the insect were carried out by using four pesticides for the seed treatments and two for the soil treatments in 1992 - 1994. The results showed that phosfolan methyl emulsifiable concentrate was most effective in seed treatments with 88.2 - 94.7% controlling effectiveness and phosfolan methyl granule and carbofuran granule were very effective in soil applications with 100% controlling effectiveness.

Key-words: Chemical control, Sunflower, Vegetable leafminer, *Phytomyza horticola*

Introduction

Vegetable leafminer, *Phytomyza horticola* Goureau , makes very serious damage on the sunflower seedlings in the northern and northeastern provinces in China. Generally, the damaging percentage of the sunflower seedlings caused by the insect is ranged 64-100%. It is harmful not only to sunflower but also to pea, oilseed rape, Chinese cabbage , radish , rutabaga and others. The pest mainly damages the cotyledons and the first pair of euphylla. The female adults wound the epiderm of the leaves with the cornicula and suck the juice , which makes the wounded points become white. The larvae eat into the leaf tissue and make the white linear-like tunnels. The actions of the pest influence the development of the seedlings. The objective of the study was to compare the effectiveness of several insecticides for controlling the insect.

Materials and methods

The trials were conducted in the experimental plots of Jilin Province Research Institute of Sunflower, in which the insect was of outbreak last year, at Baicheng City of Jilin Province from May to July in each of 1992 - 1994. The insecticides used for seed treatments (kg / 100 kg seeds) in the study included 35% phosfolanmethyl EC at 0.8, 1.0 and 1.2; 35% phosfolan EC at 0.5, 0.8 and 1.0; 40% isofenphos-methyl at 0.2, 0.3 and 0.4 and 50% methamidophos at 0.2, 0.3 and 0.4. For the seed treatments, since the maximum absorbing ratio of the sunflower seeds to water in weight was 100 to 40 in line with the trials before the study, all above mentioned dosages of the insecticides were prepared into 40 kg latices by adding certain quantity water for 100 kg seeds. The seeds were fully mixed with the latices in container and kept for 4 hours with the container sealed before sowing. The insecticides for the soil applications (kg/ha) included 3% phosfolanmethyl granule at 22.5, 37.5 and 75.0 and 3% carbofuran granule at 22.5, 37.5 and 75.0. The granules were applied near to the seeds at the same time with the sowing according to the quantity per ha. Three row plots 1.95 x 10.00 m were used in a completely randomized design with 2 replicates and the space between the rows was 65 cm and the space in the row was 30 cm.

The control effectiveness (CE) of the insecticides was calculated using the formula: $CE = c - t / c \times 100\%$ where c = percentage of the seedlings damaged in the control plots (no insecticides applied) and t = that in the insecticide treated plots.

Results and discussion

The results of the seed treatments showed that in the seed treatments, 35% phosfolan-

Table 1. Controlling effectiveness of the seed treatment with the insecticides on vegetable leafminer

Insecticides	Treatments(kg/100kg seeds)	Percentage of the plants damaged(%)	CE(%)
35% phosfolan methyl EC	0.8	4.0	94.7
	1.0	6.0	92.5
	1.2	9.0	88.2
35% phosfolan EC	0.5	18.0	76.2
	0.8	28.0	63.2
	1.0	26.4	65.3
40% isofenphos-Methyl EC	0.2	50.0	34.2
	0.3	56.0	26.3
	0.4	22.0	71.1
50% methamidophos EC	0.2	20.0	73.7
	0.3	24.0	68.4
	0.4	8.0	89.5
Control	Water	76.0	-

Table 2. Controlling effectiveness of the soil treatments with the insecticides on vegetable leafminer

Insecticides	Treatments(kg/ha)	Percentage of the plants damaged(%)	CE(%)
3% phosfolanmethyl granule	22.5	0	100
	37.5	0	100
	75.0	0	100
3% carbofuran granule	22.5	0	100
	37.5	2	96.2
	75.0	0	100
Control	Water	52.1	-

methyl EC gave the best controlling effectiveness with the range of 88.2 - 94.7% . 59% methamidophos EC for seed treatment at 0.4 kg/100 kg seeds gave 89.5% controlling effectiveness and the other two had poor controlling effectiveness(Table 1).

In the soil applications , the two insecticides gave the very significant controlling effectiveness of 100% at the treatments of 1.5 kg/ha.

The insecticides giving the significantly high controlling effectivenesses and their applying methods can be recommended to the farmers who have the problems with the insect in the sunflower production.