

## On-farm Turnip Seed Trial 2000

**Table 8. Harvest assessment (12 weeks after planting) of experimental treatments for control of cabbage maggot, *Delia radicum* L., on turnips. Planted on August 7, 2000. Canby, OR; On-Farm. (field A21)**

Treatment	Rate	% Root Damage <sup>a</sup>
		12 WAP <sup>b</sup> (11-16-00)
1 Lorsban-treated seed – Guftason (low rate)	7.5 g ai/kg	13.3 ± 1.3a
3 Lorsban-treated seed – Guftason (high rate)	19.2 g ai/kg	11.9 ± 1.3ab
2 Neem: Neemix 4.5 + 4 foliar	16 oz/acre	11.0 ± 0.5ab
4 Lorsban 4E at planting + 1 foliar	3.0 fl oz/1000 ft	10.2 ± 0.7b
6 Lorsban 4E at planting + 2 foliar	3.0 fl oz/1000 ft	5.7 ± 0.6c
5 Lorsban 4E at planting + 4 foliar	3.0 fl oz/1000 ft	1.7 ± 0.0d
	<i>F</i> =	41.80
	<i>P</i> <	0.0001

<sup>a</sup> Columns are original means ± SEM. Column means with different letters are significantly different with means separated using the Waller-Duncan multiple range K-ratio t test (*P* = 0.05). Damage percentages were transformed to arcsine of the square root of the proportion to stabilize variance. Data for each year were subjected to analysis of variance (ANOVA) general linear models (SAS Institute Inc. 9.1, 2002-2003).

<sup>b</sup> WAP refers to weeks after planting.

Crop	Turnip var. White Globe Purple Top
Plant Date	8-7-00
Location	Canby, OR: On-Farm, field #ma2100
# Treatments	6
Plot Size	5.5' x 75' bed
Experimental Design	Incomplete block design
Replication	4
Application Dates	2 Neem: Neemix 4.5 + 4 foliar (8/14, 8/29, 9/12, 9/27) 4 Lorsban 4E at planting + 1 foliar (8/14) 6 Lorsban 4E at planting + 2 foliar (8/14, 8/29) 5 Lorsban 4E at planting + 4 foliar (8/14, 8/29, 9/12, 9/27)
Evaluation Type	Damage assessment based on ~1,000-1,700 roots per whole plot (eliminating borders, 2 middle rows)
Evaluation Date(s)	11-16-00
Brief result summary	<ul style="list-style-type: none"> <li>• Turnips were planted in the fall season resulting in &lt; 15% damage.</li> <li>• Cabbage maggot damage ranged from 1.7 to 15.9%, averaging 9.0%.</li> <li>• Two well-timed Lorsban 4E foliar resulted in ½ damage than 1 Lorsban-treated seed treatment. However, Lorsban-treated seed had a good level of CM protection, but only 1 evaluation took place at 12 weeks so the # of weeks of protection was not determined.</li> <li>• Because multi-generations can attack roots, additional treatments may be necessary.</li> </ul>

**Table 1a.** Conditions at the time of application for the evaluation of treatments for control of cabbage maggot on turnips. Canby, OR (Clackamas County) 2000.

<b>Parameters</b>	<b>Application 1</b>	<b>Application 2</b>	<b>Application 3</b>	<b>Application 4</b>
<b>Application Date</b>	8/14/00	8/29/00	9/12/00	9/27/00
<b>Application Time</b>	3.50pm	9:00am	1:00pm	10:00am
<b>Crop Stage</b>	2 cotyledon/1 leaf ¾ inch high	6 leaf 12"	1.5cm root 18" high	3.5 cm root 24" high
<b>Air Temperature (°F)</b>	81 °F	68 °F	80 °F	79 °F
<b>% Relative Humidity</b>	32% rh	64% rh	36% rh	64% rh
<b>Wind Direction</b>	North	-	North	Northwest
<b>Wind Velocity</b>	2-3 mph	No wind	1-2mph	1-2 mph
<b>Soil Temperature @ 2"</b>	87 °F	-	86°F	82 °F
<b>Soil Moisture (dry, moist, wet)</b>	Moist	Moist	Dry	Dry
<b>% Cloud Cover</b>	0 %	0%	0%	0 %

## **RESULTS AND DISCUSSION**

No phytotoxicity was observed on turnip plants over the course of the 2000 study. A slight delay in plant growth development was seen in high rate of treated-seed, however it did not take long (4 days) for growth to catch up to the other treated plants.

Harvest damage was not significantly different between different rates of seed treatments (treatments 1 and 3). Damage was reduced by 23% in treatment 4 (1 foliar) and 57% in treatment 6(2 foliars). The degree of control of cabbage maggots was likely more related to timing of application than to number of chlorpyrifos applications. Chlorpyrifos applications at planting and early growth stage when cabbage maggot eggs are none to little, did not affect damage levels. Two applications – one just prior to egg-laying when plant canopy is open and one during peak egg-laying reduced damage to a greater degree than a single application at the beginning of egg-laying. We hypothesize that two well-timed applications prior to the high risk peak egg-laying period could have generated the same level of control as the five prophylactic applications and improved the economics and environmental contamination. The seed treatments held their protection for approx. 4-5 weeks, but did not hold the level of protection that a long season crop needs when exposed to 2-3 generations of cabbage maggots. A seed treatment followed by a foliar treatment during critical egg-laying in the spring would increase chances of reducing damage. Radishes, a short-term crop, are in the ground for less than a month, so seed treatments would most likely have a promising future use.