

Cabbage Maggot

Delia radicum

Introduction

A major challenge for growing Brassicas in Atlantic Canada is insect control, especially cabbage maggot (*Delia radicum*). The flies over-winter in the pupal stage (Figure 1), and emerge in the spring. The spring emergence of the fly can be timed to coincide with the blooming of yellow rocket or wintercress (Figure 2). Peak flight (50% emergence of cabbage maggot flies) coincides with 250 Growing Degree Days (base 4°C), with first emergence occurring at 161 Growing Degree Days.

Cabbage maggot flies can travel up to 1.6 km in search of host plants. There they lay their eggs in the soil at the base of the plant. The survival of the eggs is favoured by cool, moist conditions. When the larvae emerge (Figure 3), they feed on the roots of the plant. Cabbage maggot can devastate a crop, resulting in reduced yields and quality, and sometimes 60-80% crop loss (Figure 4).

Damage and Control

Crops that have an above-ground marketable portion (stem and leafy brassicas) need protection from cabbage maggot only in the early season because older plants are more tolerant to damage. However, root crops, such as rutabaga, need season-long protection against multiple generations to prevent damage to the marketable portion of the crop. The cabbage maggot can have up to three generations in our region. Chlorpyrifos is the only pesticide active ingredient registered for this pest in Canada. It is currently banned in several countries, limiting the export market.

Application of chlorpyrifos costs roughly \$152/acre for root crops (3 applications, including tractor and operator). If the pesticide fails to provide control, then not only are quality and yield at risk, but money has also been flushed away on ineffective applications.

Figure 1. Cabbage maggot pupae.

Figure 2. Yellow Rocket, aka, winter cress (*Barbarea vulgaris*) in flower. Photo courtesy of UMass Weed Herbarium.

Fig. 1



"Cabbage maggot can devastate a crop, resulting in reduced yields and quality, and sometimes 60-80% crop loss."

Fig. 2



There are a few cultural control methods that can be used against this pest. Fall tillage can be used to bury crop residue and expose the over-wintering pupae to predation. Insect netting and floating row covers can be used to screen out cabbage maggot flies (Figure 5). However, if the field has a recent history of Brassicas, cabbage maggot flies will emerge under the insect netting and will still cause damage. Insect netting will allow approximately 90% of natural light through, 75% of wind, and 100% of rain.

Preliminary insect netting research by Perennia and Agriculture and Agri-Food Canada have demonstrated that mesh sized 0.3 mm, 0.6 mm, 0.8 mm and 1.33 mm all work equally well against the cabbage maggot. Mesh sized 0.3 mm and 0.6 mm will also provide protection from other insect pests such as flea beetles.



Figure 3. Cabbage maggot larvae at the base of a broccoli plant.



Figure 4. Early signs of crop damage from cabbage maggot.



Figure 5. Insect netting used as a barrier against cabbage maggot flies.

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