

## Insecticides Required to Meet Consumer Demands for Blemish-Free Carrots in the EU

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Carrot is one of the most important vegetable crops in the EU covering approximately 84,000 hectares with 6 billion pounds of annual production. The carrot fly is the major insect pest of the carrot crop in Europe.

Before the introduction of synthetic chemical insecticides in the 1950s, the carrot fly typically damaged 20-50% of the carrots grown in Europe [1]. In some parts of Europe, the damage from the carrot fly was so severe that it was not profitable to grow carrots [2]. Carrots grown commercially can be rendered unmarketable by even slight carrot fly damage [3]. To meet the stringent levels of blemish-free produce demanded by the supermarkets in Europe, commercial growers depend on insecticides [3]. In areas of Switzerland with high infestations, 5-8 sprays are carried out to control carrot fly [4].

The insect has one, two or, in warmer climates, three generations each year. Adults feed on the nectar and pollen of many plant species. Females search out carrot plants in order to lay their eggs in the soil near the tops of the plants. The larvae, which emerge from the eggs, migrate down to feed on plant roots [3]. The larvae feed for about a month. The carrot fly is also called the "carrot rust fly" from the rust-colored frass that they deposit in the feeding tunnels on the carrot.

As for non-chemical means of control, especially because there has been little evidence of parasitoids or predators of the carrot fly, research has concentrated on physical barriers (soil covers and vertical nets), resistant varieties, and repellent substances. With the exception of soil covers, alternative methods of control have shown no satisfactory results to date [5]. Nets provide good control, but at a high cost. Nets are not adapted to large fields and foliar disease problems are exacerbated [5]. Severe damage occurs from carrot fly in organic carrot crops in Europe [4].

### References

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Carrot fly larva



Carrot fly



Nets covering control plots



Carrot fly damage