



## Cabbage root fly model (Warwick HRI)

### FACTSHEET

#### **Cabbage root fly cause damage on brassica roots**

The cabbage root fly (*Delia radicum*) overwinters as a pupa, in diapause. The first generation of adult flies emerges in the spring and mated female flies lay their eggs in the soil close to the base of brassica plants. After hatching, the larvae feed on the roots and may tunnel into them, causing damage. These larvae form pupae, which lead to the emergence of a new generation of adults. Depending on the local climate the number of cabbage root fly generations and their timing can differ. When the weather is particularly hot, cabbage root fly pupae may aestivate. In some areas there is an additional biotype of cabbage root fly which has an extended pupal diapause and emerges later in the spring. We call the two biotypes “early emerging” and “late emerging”.



## Control with help of DSS on platform.ipmdecisions.net

A series of development rate equations form the basis of the simulation model and are linked together in a program. The model simulates the development of cohorts of 500 individuals through adult emergence, egg laying and hatching. For each stage, the percentage development is calculated each day by integrating the appropriate development rate curve. This percentage is accumulated over days until it reaches 100. At this point the individual moves to the next stage. Variability within the insect population is incorporated by assuming that, at any instant, the rates of development of a population held at a constant temperature are normally distributed.

### DSS parameters

The Cabbage Root Fly model uses soil temperatures or air temperatures depending on the stage of development. Within the model it is possible to specify the proportions of the early and late emerging biotypes in the simulated population. As multiple cohorts progress simultaneously, adult emergence and egg laying can occur at the same time. The Cabbage Root Fly forecast requires hourly soil temperatures at a depth of approximately 6 cm and hourly air temperatures. This model requires historic data to provide risk forecasts. At present, suitable historic data is only available for a limited number of locations; please select 'Edit Parameters' and select the most appropriate location. The start date for the model is 1st February, as this is often the coldest period in the year.

### DSS output

The DSS gives information about the risk of adult cabbage root fly flight activity. It can be seen that at 210 degree days (which is the upper threshold value), the risk of flight activity is high and it is likely that egg laying has begun on vulnerable brassica crops. Action should be taken to protect the crop, taking into consideration the observations in your own field.



## Where can DSS be used

This DSS was developed by the University of Warwick (Warwick Crop Centre), England and adapted from work carried out in the UK. This model requires historic data to provide risk forecasts. At present, suitable historic data is only available for a limited number of locations.

## NEED MORE INFORMATION?

[platform.ipmdecisions.net](https://platform.ipmdecisions.net)

Follow us at



@IPMDECISIONS



IPM DECISIONS



IPM DECISIONS



Horizon 2020

No. 817617

[www.ipmdecisions.nl](https://www.ipmdecisions.nl)