Wheat bulb fly

Life cycle and symptoms
Eggs are laid from late July until early September and remain dormant throughout late autumn and early winter.

Larvae hatch between January and March and invade cereal plants. Each larva can attack several tillers. Attacked tillers eventually die back to show the classic ‘deadheart’ symptoms.

Risk factors
Crop: All cereals except oats can be attacked by wheat bulb fly, although damage is most frequently reported in wheat. Winter wheat sown from November onwards, or crops sown in spring before the end of March, are particularly vulnerable as they may have only a single tiller at the time that wheat bulb fly larvae hatch.

Season: The level of risk fluctuates each season, mainly due to July and August rainfall and harvest dates of the previous wheat crops. The longer crops remain unharvested, the longer adult flies have to feed on fungi on the cereal ears and mature their eggs. Incidence generally increases following a wet harvest period (eg 2004, Figure 1) and is lowest after a hot, dry summer (eg 1995, Figure 1).

Location: Wheat bulb fly is most prevalent in eastern England.

Rotation: Wheat bulb fly likes to lay its eggs in bare soil. Freshly cultivated soil is particularly favourable.

Eggs are laid:
– Following fallow s or crops that are harvested early, such as vining peas
– In between rows of crops such as potatoes, sugar beet and onions

Figure 1. The proportion of fields sampled each year exceeding the threshold of 250 eggs/m².
Thresholds

<table>
<thead>
<tr>
<th>Risk category</th>
<th>Drilling date</th>
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</thead>
<tbody>
<tr>
<td>Low (&lt;100 eggs/m²)</td>
<td>Nov-Dec</td>
</tr>
<tr>
<td>Moderate (100-250 eggs/m²)</td>
<td>Nov-Dec</td>
</tr>
<tr>
<td>High (250-500 eggs/m²)</td>
<td>Nov-Dec</td>
</tr>
<tr>
<td>Very high (&gt;500 eggs/m²)</td>
<td>Nov-Dec</td>
</tr>
</tbody>
</table>

Wheat bulb fly thresholds

A seed treatment may be necessary in all instances except where there are less than 100 eggs/m² in crops drilled in Nov–Dec. The risk, however, increases the later the drilling and the higher the egg count.

Wheat bulb fly survey

The AHDB Cereals & Oilseeds-funded wheat bulb fly survey is done by ADAS to aid decision-making on seed treatments. The information is published every year in September. The survey measures the annual incidence of wheat bulb fly in the autumn by taking soil samples from high-risk fields and extracting and counting wheat bulb fly eggs. See cereals.ahdb.org.uk/pests for more information.

Control

Cultural control
- Drill as early as practical
- Avoid deep drilling
- Increase the seed rate to compensate for attack, especially in late-drilled crops
- Early top dressing will aid recovery in the spring
- In fields going into cereals, avoid bare ground in July/August and delay cultivation until after egg laying

Chemical control

Seed treatment
Fludioxinil + tefluthrin (Austral Plus) and cypermethrin (Signal 300 ES) are effective on late-sown crops (November onwards) and are the recommended treatments for late-autumn/winter sowings made before the end of egg hatch in areas and rotations at risk from wheat bulb fly.

Treated seed should be drilled at a recommended depth of 2.5–4 cm in a firm, even seedbed.

Seed treatments may not be sufficiently persistent to fully protect crops sown in September/October.

Identification

Avoid confusion with larvae of other flies. Frit fly damage may be seen from September to January which is earlier than wheat bulb fly.

Larvae of the yellow cereal fly can be found from February to April (similar to wheat bulb fly larvae), particularly in wheat sown before mid-October. They are thinner than wheat bulb fly larvae and invade through the top of the shoot, leaving a characteristic brown incision spiralling down the tiller. Unlike wheat bulb fly larvae, they attack only one tiller.

Further information

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Encyclopaedia of pests and natural enemies in field crops (AHDB, 2014)
cereals.ahdb.org.uk/pests
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