Saddle gall midge

Importance

Saddle gall midge (*Haplodiplosis marginata*) is a sporadic pest of cereals, which usually persists at low population levels.

In 2010 and 2011, local epidemics were reported in central England, particularly in continuous cropping or tight cereal rotations.

Yield loss can be caused by constricted vascular supply to the ears as a result of larval feeding and by lodging of gall-weakened stems in high winds.

Life cycle

Adult midges emerge from their overwintering sites in the soil in spring. After mating, the larger reddish females lay their eggs (up to 250) on the upper and lower surface of cereal and grass leaves. The blood-red eggs are arranged in rafts along the leaf veins (Figure 1).

Eggs hatch within 1–2 weeks; the newly hatched larvae move down the leaves to feed on the stem underneath the leaf sheath (Figure 2), where their feeding activities cause the formation of characteristic saddle-shaped galls. These galls occur mainly on the top three internodes but may occur on lower internodes in backward crops. The galls (Figure 3) are usually covered by the leaf sheath. Symptoms may be more apparent as uneven contours on the stem surface (Figure 4).

Once larvae achieve maturity in July, they fall off the stems and seek refuge in small hollows within the soil, where they enter diapause (a period during which growth and development are suspended) until the following spring. They pupate from April onwards and eventually emerge again as adults in May. The time of emergence is likely to be dependent on soil temperature and moisture. In exceptionally warm weather, emergence can be as early as late April.

Latest information

- Crops at greatest risk include late-sown winter wheat, late-sown winter barley and spring cereals.
- There are no label recommendations for the control of saddle gall midge for any approved insecticide in the UK but useful control has been reported in Romania with some pyrethroids.

Action

- Use non-cereal break crops to reduce the risk of infestation.
- Carry out a risk assessment to predict adult emergence.

Always read product labels, consider your local conditions and consult a professional agronomist, if necessary.
Risk factors
The worst damage is caused when larval feeding coincides with stem extension. Crops that have passed this stage at the time of adult migration will suffer less damage even if eggs are laid on them. Late-sown winter wheat and barley and spring-sown cereal crops are, therefore, at greater risk. Winter-sown oats, while attracting adults for egg-laying, are rarely seriously damaged.

Continuous cereals are more at risk as overwintering larvae are able to delay pupation to subsequent years if soil conditions are unsuitable (ie very dry), allowing pest numbers to build up. The adults are not strong fliers and do not travel long distances unless caught up in strong winds.

Large populations are associated with heavy soils. Warm and damp soil conditions in May/June are ideal for adults to emerge and lay large quantities of eggs within a short period.

Monitoring
Yellow water traps are the most effective method of catching adult midges. Yellow sticky traps and pheromone traps can also be used.

Midge development in soil can be monitored by taking regular soil samples and extracting the developmental stages by wet sieving. This can give an indication of when adult midges are likely to emerge.

The risk of crop damage is dependent on the number of adults emerged and the timing of emergence, rather than the number of larvae in the soil.

Cultural control
Introducing non-cereal break crops into the rotation may have a significant impact on the level of damage over the whole farm.

The use of oats, which act as a trap crop by attracting egg-laying females but not allowing development of larvae, may also reduce the risk.

For cereals, early sowing in September can reduce the risk of damage.

Biological control
Consumption of larvae in the soil by soil-inhabiting predators, such as carabid beetles, staphylinid beetles and spiders may give some control.

A parasitic fungus, Lecanicillium spp., can affect the viability of saddle gall midge larvae. Some evidence of control by parasitoids has been recorded in Germany.

Chemical control
There are no label recommendations for the control of saddle gall midge for any approved insecticide in the UK.

Experiments conducted in Romania have shown good control by pyrethroids, such as deltamethrin, lambda-cyhalothrin, alphacypermethrin and esfenvalerate, applied 10–14 days after the first adults are observed migrating.

Research has shown that application timing is crucial to target the larvae when they migrate down the stems to their feeding sites. Once the larvae have crawled under the leaf sheath, they are difficult to control. More than one application to cover this period may be necessary.