

Biology and management of slugs

Background

Slugs are the most common and widespread pest affecting all farmers and growers. There are 29 species of slugs in the UK. The most destructive are from the *Deroceras*, *Arion* and *Malix* groups. Very few crops are unaffected as slugs are polyphagous and feed throughout the year whenever conditions are cool/warm and damp. With FYM & green manures, soil organic matter levels are increased which favours slugs. Snails tend to be less important, but can cause problems in gardens and on cane fruits.

Natural enemies

Slugs are taken by a variety of birds including rooks, jackdaws, lapwings and ducks especially Runner types. Vertebrates, including frogs, hedgehogs, moles and shrews, will also eat slugs. Carabids (ground beetles) and staphylinids (rove beetles) are examples of some of the beneficial insects that prey on slugs and slug eggs.

Nature of damage

Generally slugs feed at night when conditions are warm and damp, however some species (*Deroceras*) are active at low temperatures. Frosty and very dry weather greatly reduces slug activity, forcing them down into soil. Slugs can feed both below ground and on the surface on living or dead plant material. Damage can vary from eating ungerminated seed, seedling stems, stripping of leaves and growing points above ground. Tubers and tap roots are also attacked with holes being made superficially and in some instances deep into the flesh. Tuber and tap root damage most often occurs after wet summers and autumns although it occasionally occurs in dry conditions.



Life history

Slugs lay up to 50 small eggs in clusters at various times of the year depending on the species. They are usually laid in decaying organic matter or just below the soil surface. At this stage desiccation and frost are capable of causing very high rates of mortality. Eggs laid during warm springs tend to hatch in approximately three weeks, if laid during late autumn however they may not hatch until the following spring. On hatching young slugs feed on humus and organic matter below ground. As they mature, slugs move on to feed on both living and dead plant material. Some species have only one breeding season a year whilst others have two or more.

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Control measures

- Preparing fine seedbeds will reduce the movement of slugs between their shelter in the soil and the crop. Soil cultivation during both high and very low temperatures will expose slugs and slug eggs to desiccation and freezing respectively
- To reduce large slugs (*Arion* spp.) migrating into susceptible crops from setaside areas, meadows and hedges should have a 3-5 m guard area kept cultivated and weed free
- *Phasmarhabditis hermaphrodita* are a commercially available species of nematode that seek out slugs and parasitize them, reducing slug feeding and eventually causing death in 1-2 weeks
- Slug fences can be effective in greatly reducing slugs migrating in from hedges, etc. But they have no effect on the resident population and should be used with other control methods such as trapping or hand collecting
- Trapping methods include bran traps, beer traps and commercially available slug traps. If using a lure-type trap slugs can be attracted from other areas into the crop
- Hand collecting regularly at dusk and dawn is labour intensive and laborious. However, it may be useful when used in conjunction with other control measures on very susceptible or high value crops

Further Information

Books and papers

- David Frost (2003) *Review of pest and weed control in organic systems*, Organic Centre Wales
- Marion Gratwick, *Crop Pests in the UK – Collected edition of MAFF leaflets*, MAFF / ADAS Published by Chapman & Hall, London 1992

Websites

- Bayer crop science *Expert Guides: Slugs* (not exclusively organic)
<http://www.bayercropscience.co.uk/output.aspx?sec=273&con=592>
- Cyber-Help for Organic Farmers (USA),
<http://www.certifiedorganic.bc.ca/rcbtoa/training/pestmanagement.htm>
- Database of IPM Resources (USA) <http://ippc.orst.edu/DIR/index.htm>
- Henry Doubleday Research Association <http://www.hdra.org.uk>
- Organic Integrated Pest Management (USA) http://www.attra.org/attra-pub/summaries/organic_ipm.html.
- The Pest Bulletin, HDC. <http://www2.warwick.ac.uk/fac/sci/hri2/hdcpestbulletin/>

Please note that the USA based websites may not be appropriate in terms of pest life cycles, timing of management operations etc.

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