Overview of pests & natural enemies

Cereals

	Ground beetles	Rove beetles	Ladybirds	Solider beetles	Parasitoid wasps	Web-spinning spiders	Non web-spinning spiders	Hoverfly larvae	Lacewing larvae	Predatory flies	Birds
Summer aphids	■	■	■	■	■	■	■	■	■	■	
Autumn aphids	■	■	■		■	■	■				
Cereal midges	■	■			■	■		■		■	
Wireworm	■				■						■
Wheat bulb fly	■	■			■		■				
Frit fly	■	■			■	■	■			■	
Gout fly					■						
Yellow cereal fly	■		■	■			■				
Leatherjackets	■				■						■
Slugs	■	■		■							■

Oilseed Rape

	Ground beetles	Rove beetles	Ladybirds	Solider beetles	Parasitoid wasps	Web-spinning spiders	Non web-spinning spiders	Hoverfly larvae	Lacewing larvae	Predatory flies	Birds
Aphids	■	■	■	■	■	■		■	■	■	
Cabbage stem flea beetle	■	■			■		■				
Pollen beetle	■	■	■		■		■				
Cabbage seed weevil	■				■						
Rape winter stem weevil	■	■			■		■				
Brassica pod midge	■	■			■	■	■	■		■	
Cabbage stem weevil	■	■			■		■			■	
Cabbage root fly	■	■			■		■			■	
Slugs	■	■		■							■

For more information, visit: ahdb.org.uk/knowledge-library/encyclopaedia-of-pests-and-natural-enemies

Carabid (Ground) Beetles

Diet

Adults consume up to their own bodyweight every day and feed on a wide range of prey.

Larvae are soil-dwelling and also predatory. In lab trials a single larva killed an average of 3 slugs per day.

Adults will eat aphids which have fallen from plants, or early season bird cherry-oat aphids that colonise the base of the plant. Some species will climb up plants to search for aphids.

Predation increases with temperature. A large adult beetle can consume up to 125 aphids a day at 20°C. Some species will also eat weed seeds.

Biology

Larvae: elongated with biting mouthparts. Soil-dwelling but hard to find.
Adults: 'chunky', typically black or brown, often metallic/shiny, biting mouthparts, most are flightless.

Different species are active at different times of year but will generally be present all year round. Adults of many species are nocturnal.

Adults tend to be within 50m of crop edge, larvae are more widespread. A beetle can move over an area of 25–150 m^2/week depending on prey density and can live for over 1 year.

Most effective at suppressing early pest populations.

Agronomic Impacts

Use of both cypermethrin and deltamethrin in trials led to a 70-80% reduction in carabid activity. Numbers recovered within 1-2 months but there is evidence of long term declines on farmland for some species.

Deep cultivation that is used as a cultural control for slugs can have a negative impact on some species of ground beetle, but not all.

Parasitoid Wasps

Diet

Rate of parasitism needed for biological control is around 33%. Most pest species are affected by at least one parasitoid (wasps or flies) which may attack eggs, larvae, pupae or adults.

Adult wasps lay their eggs in the host insect, which then develop and kill the host from the inside. A single adult female can parasitise over 100 aphids in her lifetime. Parasitism isn't immediate and aphids take a few days to succumb.

Field experiments in Germany showed parasitoids were responsible for aphid reductions of up to 70%

Biology

Adults: Tiny (<10mm) flying insects with a narrow 'waist' and long antenna, typically black/brown.

Evidence of aphid parasitoids can be seen in the form of aphid 'mummies' – immobile, swollen and discoloured aphid bodies sometimes with a hole where the wasp has emerged.

Adults feed on nectar, pollen and honeydew. Adults are mainly active May-Aug and can overwinter within the host.

Cabbage stem flea beetle has both larval and adult parasitoids, the former emerges Mar-May and the latter attacks adults in summer. Parasitism of pollen beetle can range from 25-50%

Agronomic Impacts

Due to their size and host specificity, parasitoids are highly vulnerable to the impacts of insecticide use.

In a field trial, parasitoids of the rape winter stem weevil and cabbage stem weevil were reduced by 39 and 58% respectively following application of lambda-cyhalothrin compared to untreated plots.

Diverse flowering field margins are an important source of food for adult parasitoids.

Money Spiders (web-spinning)

Diet

Sheet webs produced by money spiders can catch large numbers of aphids and other flying insects. Aphids get caught as they migrate in and when they drop from plants due to disturbance.

Biology

Small grey/black spiders 1.2-7.2mm long, most under 3mm. Very common in the UK – can account for up to 99% of spiders on arable land.

They can travel large distances carried by the wind on strands of silk, in autumn webs can often be seen covering fields. Can be found all year round and overwinter predominantly in non-crop habitats.

Agronomic Impacts

Increasing area of non-cropped habitat can increase the numbers of money spiders in the crop in spring.

Money spiders are sensitive to habitat disturbance e.g. ploughing. Populations can take longer to recover in field margins if cut in summer compared spring. Diverse vegetation structure in fields (e.g. stubble, cover crops) provides sites for web building.

Ladybirds

Diet

Adults can eat up to 50 aphids a day. In lab trials larvae ate on average 25 aphids in 24hrs.

Biology

Adults emerge late summer and overwinter in sheltered places. Eggs are laid spring to early summer.

Ladybirds are strong fliers (up to 74 miles!) but disperse randomly, and only begin hunting once they have landed. Both adults and larvae will search for prey on the ground and on vegetation. Adults will feed on nectar and pollen from simple open flowers.

Agronomic Impacts

Both adults and larvae are vulnerable to broad spectrum insecticides. Thistle, grasses and nettles provide valuable habitat for adults.