



Beetle Banks

Beetle Banks Defined

'Beetle banks' are graded low banks that are placed in fields to enhance populations of predatory beetles and spiders. They are planted with tussock- or mat-forming grasses to provide high quality, over-wintering habitat, from which these invertebrates disperse in the spring.

Beetle banks compensate for the loss or absence of traditional hedgerows, for isolation from natural over-wintering habitats, including riparian zones, and for fragmentation of farmland, and loss of connectivity between habitats in the farming landscape.

Beetle banks take two to three years to become established. They can harbor 1,500 invertebrates/m². Predatory invertebrates colonize the centers of fields more rapidly and in greater numbers when they are used.

Beetle Bank Construction



September and October are the best months to establish the grass sward on beetle banks. The bank should be about 0.4m high and 2m wide, cutting across the middle of the field, leaving space at either end for machinery transit. The field is still farmed as one unit.



- The bank is created by careful two-direction ploughing, with furrows ploughed against each other, during autumn cultivation.
- Machine drill or hand sow with a mixture of perennial grasses including at least 30% tussock- and mat-forming species (in the UK, these include orchard grass (*Dactylis glomerata*) and Timothy grass). The rest of the mixture can consist of fescues and bents.
- For good establishment these can be sown at a rate of 70 kg/ha.
- Three cuts may be necessary in the first year (when the sward reaches 10cm) to encourage grasses to tiller and control invasive annual weeds.
- Once established, cuts are needed only to encourage dead tussocks to regenerate, and to control woody species (approx. once in three years).
- Beetle banks are particularly susceptible to pesticide drift.

Types of Natural Enemies which Make Use of Beetle Banks

Beetle banks provide over-wintering habitat for predatory invertebrates that complete their life-cycles within the field. These tend to be generalist species, with a wide range of invertebrate prey.

Many of these species evolved in riparian zones, and they are adapted to seek high, dry locations over the winter to avoid seasonal flooding. They colonize fields for the same reason they colonize stream banks; because of high abundance of invertebrate prey.

Research has shown that the abundance of these species on farmland may be limited by lack of over-wintering habitat.

Over-wintering predators colonize the beetle banks in the early fall, and migrate into the field in early spring.

They include:



Rove beetles (Staphylinidae): spring/summer active winged insects, that feed on fungal spores, aphids, and other plant and soil-borne prey. Also common in compost mounds and decaying vegetation. One to two generations a year.



Ground beetles (Carabidae): night or day active, winged or wingless insects, mainly on the soil surface. They include spring and fall-breeding species, some of which may be active throughout the growing season. They only have one generation a year, and they are susceptible to local extinction following use of broad spectrum insecticides.

Adults and larvae feed on insect eggs (e.g. cabbage maggot eggs), slugs and worms, and ground active prey, including the many pests that fall from the plant.



Some species climb plants and feed on insect larvae and eggs on leaf surfaces.



Spiders, that may be ground active hunters, sheet web producers on the ground, or web-forming species in the plant canopy. May have several generations a year. Very susceptible to natural and synthetic pyrethrins.



Information from Game Conservancy Trust, Royal Society for the Protection of Birds, Hampshire and Isle of Wight Naturalists Trust, Personal communications from Steve Wratten, Lincoln University NZ, UK-based research by Paul Jepson (now OSU, IPCC)

