

The biology and non-chemical control of Bramble (*Rubus fruticosus* L. agg.)

W Bond, G Davies & R Turner

HDRA, Ryton Organic Gardens, Coventry, CV8, 3LG, UK

Bramble

(Blackberry)

***Rubus fruticosus* L. agg.**

(*R. sect. 2 Glandulosus*).

Occurrence

Bramble is a woody perennial that has biennial to perennial stems (Grime *et al.*, 1988). Bramble is native in a range of natural and man-made habitats. It occurs throughout Britain in hedgerows, scrub, woodland and wasteland. Bramble can form extensive thickets in open sites. It is absent from mown and grazed grassland and is most frequent in soils of pH 3.5 to 5.0. In a 3-year set-aside, bramble frequency declined with increasing distance from the field edge (Rew *et al.*, 1992). It can be a problem weed in gardens (Copson & Roberts, 1991).

Most of the taxa of sub-genus *Rubus* form a complex, largely apomictic group, often referred to collectively as *R. fruticosus* L. agg. (Stace, 1997). Plants are very variable in almost all characters and over 300 microspecies are recognised. Some forms are uncommon on calcareous soils while others are widespread on chalk and clay. The taxonomy is still under investigation and field identification requires expert confirmation.

Although a weed of meadows and pasture, bramble is valued for its edible blackberries and is often cultivated (Morse & Palmer, 1925). The leaves have medicinal uses and the roots yield an orange dye (Barker, 2001). On footpaths and in semi-natural situations brambles can create a trip hazard with the looping shoots that root at the tips.

Biology

Bramble flowers from June to September and seed is set from September to October (Grime *et al.*, 1988). There are around 20 seeds per blackberry fruit and 40,000 seeds per plant but much of the seed is non-viable. Most bramble species are polyploids producing seeds by pseudogamy (Amor, 1974a). Pollination is needed but there is no fusion of the male and female sexual cells. However, seeds are sometimes produced through normal cross-pollination by insects.

Seed germination often does not occur until the second year after shedding (Grime *et al.*, 1988). Seeds have a hard seed coat and a chilling requirement to overcome. A 3-month period of moist storage at 5°C did not promote seed germination (Grime *et al.*, 1981). Plants take three years to flower from seed.

Individual stems bear flowers and fruit in their second year (Grime *et al.*, 1988). In the autumn, the stem apices become positively geotropic and elongate rapidly to reach and penetrate the soil surface before developing adventitious roots and forming a new plant (Amor, 1974a). More daughter plants are found in sheltered sites such as

woodland margins than in exposed situations. Bramble may also regenerate from rooted stem fragments (Grime *et al.*, 1988).

Persistence and Spread

Reproduction and spread is by seed, by stem apices rooting and forming new plants, and in some forms, by suckers developing from the lateral roots (Amor, 1974a; 1974b). Root suckers can emerge from lateral roots 45 cm deep. Brambles readily regenerate from fragments of root and stem too.

Seeds can pass unharmed through the digestive system of birds and this often enhances germination (Amor, 1974a).

Management

The roots of bramble are killed by frequent cultivation (Amor, 1974a). The production of daughter plants can be reduced by grazing with sheep, cattle or horses, and by mowing. However, cutting the stems at or near ground level stimulates the formation of suckers from the lateral roots (Amor, 1974b).

Intensive grazing by any livestock prevents bramble becoming established (Popay & Field, 1996). Goats will eat spiny weeds. Brambles are an important constituent in the diet of several types of deer (Underhill-Day & Liley, 2006). Bramble is not eaten by rabbits (Tansley, 1949).

In Australia and in Chile, where blackberry has become naturalised and is a serious weed problem, biological control studies with insects and fungi from its native habitats in Europe began in 1977 (Bruzzese & Turnbull, 1982; Hasan, 1979). These include the rust fungus *Phragmidium violaceum*, the stem-boring sawfly *Hartigia albomaculatus* and the purple blotch fungus *Septocya ruborum*. The rust fungus attacks the leaves, flowers and immature fruits. Larvae of the sawfly burrow into the emerging shoots and destroy the pith. The blackberry purple blotch fungus attacks the base of the new shoots and causes dieback of the plants. In Australia, different strains of the blackberry rust fungus attack a different range of blackberry species (McLaren, 1993). Some strains have been introduced illegally.

Acknowledgement

This review was compiled as part of the Organic Weed Management Project, OF 0315, funded by DEFRA.

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