The biology and non-chemical control of Long-headed Poppy (*Papaver dubium* L.)

W Bond, G Davies, R Turner
HDRA, Ryton Organic Gardens, Coventry, CV8, 3LG, UK

Long-headed poppy

(blaver, blind eyes, cock's-head, headache, yedwark)
Papaver dubium L.

Occurrence

Long-headed poppy is an annual or overwintering weed of arable land, especially cornfields, and of waste places and roadsides (Clapham *et al*., 1987). It is probably native and is found throughout lowland Britain. It has a similar distribution to the common poppy but extends further north and is more frequent in Wales (McNaughton & Harper, 1964). The distribution on upland areas is limited by the lack of cultivated land, but it has been recorded at 1,400 ft. Long-headed poppy is found on light, dry, sandy and gravely soils but also flourishes on heavy land. The plant can withstand drought and occurs in quite arid areas. It was considered to be comparatively rare in the early 20th century but by the middle of the century it had become universally common. In a survey of arable weeds in 1971-73, it was absent or rare in most of the areas surveyed but was common to frequent in 9% of them (Chancellor, 1977).

Long-headed poppy is phenotypically very plastic and the size of the plant, growth habit, capsule number and flower shape are all greatly modified by the environment (McNaughton & Harper, 1964). In open situations it forms a flat rosette of leaves. In poor or waterlogged soils plants may be small with few capsules. A white flowered form has been recorded. The long headed poppy releases a white sap when damaged. In Babington's poppy, *P. lecoqii,* which is regarded now as a sub-species of the long-headed poppy, the sap turns yellow on exposure to the air (Stace, 1997). It is less common and is not considered to be an arable weed, being found mainly in waste places and road verges (McNaughton, 1956). The different poppy species often occur together but few natural hybrids have been found. Hybrids between the common and the long-headed poppy created artificially often die prematurely or suffer various growth distortions (McNaughton & Harper, 1960b).

The plant is poisonous to livestock but is rarely eaten due to its objectional taste and smell (Chancellor, 1959). It is unpalatable to grazing animals due to the high alkaloid content (McNaughton & Harper, 1964).

Biology

Long-headed poppy flowers from May to July. It is self-fertile but requires cross-pollination to achieve maximum seed production. The anthers dehisce before the flowers open so self-pollination could occur ahead of cross-pollination but in the long-headed poppy the anthers are positioned below the stigmas to favour outbreeding. The poppies are normally insect pollinated, honey and bumble bees are the main pollinators (McNaughton & Harper, 1960a). The insects tend to keep to one species of poppy which restricts inter-species pollination. The time from pollination to dehiscence of the seed capsule is 5 to 6 weeks. Under favourable conditions a plant may bear 100-200 capsules each containing 800-900 seeds (Harper, 1966) or 2,000

seeds (Salisbury, 1961). The average seed numbers per plant is given as 5,700 but output can vary from just 10 seeds up to 160,000. The 1,000 seed weight is 0.1404 g.

Fresh seeds are inherently dormant and normally will not germinate for several months (McNaughton & Harper, 1964). Seeds usually germinate in spring but germination occurs sporadically over several years. Immature seeds are said to germinate more readily than fully mature seed. Seed from green, sun-dried capsules remained dormant through the winter but germinated appreciably in February (Gill, 1938). Dead ripe seed did not germinate after collection and remained dormant until the seedcoat was broken. The germination of fresh seed is not promoted by light (Wesson & Wareing, 1969). Seed stratified outdoors in soil overwinter was exhumed and tested for germination in the light, in the dark and in the dark with a 5 second flash of light (Andersson *et al.,* 1997). Seed gave less than 2% germination in any of the conditions. There was 80% germination of seeds during 2-months moist storage at 5^{o}C (Grime *et al.,* 1981).

Seed sown in a 75 mm layer of soil in cylinders sunk in the field and stirred periodically, emerged in spring but the main emergence period was in autumn (Roberts & Boddrell, 1984). Less than 1% of viable seeds in the soil seedbank will germinate and produce seedlings even when the soil is disturbed in the season of peak emergence (Roberts, 1981). It normally behaves as a summer annual (McNaughton & Harper, 1964) but the long-headed poppy does germinate in autumn (Salisbury, 1961). Seedlings are susceptible to frost, however, and winter losses can be high (McNaughton & Harper, 1964). Plants that survive the winter, flower the following summer.

Persistence and Spread

The seeds can remain viable in soil for a very long time (McNaughton & Harper, 1964). Seeds recovered from excavations and dated at 50 years old were reported to have germinated (Ødum, 1974).

The seeds are shaken out through pores under the disc at the top of the capsule (McNaughton & Harper, 1964). The wind shakes the seeds from the capsule but does not disperse them further.

Seedlings have been raised from the excreta of various birds (Salisbury, 1961).

Management:

Where seeding has occurred, spring germination should be encouraged by keeping seeds at or near the soil surface. Good surface cultivations will destroy the seedlings. Deep cultivation should be avoided as it will bring buried seeds to the surface (Morse & Palmer, 1925).

Long-headed poppy seed is susceptible to soil solarization.

The plant is attacked by a gall midge, *Dasyneura papaveris*, that causes the seed capsule to swell into a ball shape.

Acknowledgement

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

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