

The biology and non-chemical control of Giant Hogweed *(Heracleum mantegazzianum* Sommier & Levier)

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Giant hogweed

(cartwheel flower, common hemlock, giant cow parsnip, poison hemlock)

***Heracleum mantegazzianum* Sommier & Levier**

(*H. asperum*, *H. giganteum*, *H. villosum*)

Occurrence

An introduced biennial to monocarpic perennial naturalised on roadsides, hedgerows, waste places and rough grassland (Stace, 1997; Tiley *et al.*, 1996). Giant hogweed is scattered throughout the British Isles and is locally common especially along riverbanks. A native of the Caucasus mountains of south-west Asia, it was introduced in the late 19th century as an ornamental plant (NRA, 1994). Spread of the weed increased greatly between 1930 and 1982 (Williams & Forbes, 1982). In Britain giant hogweed is mainly a lowland plant. It is resistant to frost.

Giant hogweed is the largest herbaceous plant in the European flora (Tiley *et al.*, 1996). Naturalised plants are very variable in perennation, size and shape (Weber, 2003). Hybrids occur between the giant hogweed and the common hogweed (*H. sphondylium*) (Anon, 1982; Lovett Doust & Lovett Doust, 1982).

The stem and leaf stalk contain a sap that is released by handling, cutting or just brushing against the plant (Anon, 1982). The sap contains furanocoumarins that photosensitise the skin so that exposure to sunlight results in painful blistering. Occasionally this may trigger recurrent dermatitis. Some injury may be seen in stock animals that graze the plant but usually there are no long-term effects (Tiley *et al.*, 1996). Higher levels of furanocoumarins are found in plants growing in open sites than in plants growing in the shade.

Giant hogweed is a host of carrot fly (*Psila rosae*).

Biology

It can take 4 years for a giant hogweed to flower, after which the whole plant normally dies (Tiley *et al.*, 1996). The flowers appear in early June and July. The flowers are insect-pollinated and self-compatible. A single flower head may have over 5,000 seeds and a plant may produce 50,000 to 80,000 seeds. Seeds are shed from late August to mid-October.

Fresh seeds may have an after-ripening requirement. Most seeds germinate in the year after shedding and following a period of natural stratification over the winter. The level of seed germination increased from 0 to 40% during a 3-month period of moist storage at 5°C (Grime *et al.*, 1981). Seed mixed into the surface 25 mm of soil in boxes out of doors and stirred periodically emerged from January to June (Chancellor, 1979). The main peak of emergence was in April. Other studies suggest that a few seeds germinate in autumn and in mild spells in winter and early spring, with most germination from January to March (Tiley *et al.*, 1996). There is then little

germination after March. In the wild, seeds germinate well in surface organic matter and detritus if adequate moisture is present. A sufficient depth of soil is required to allow the taproot to develop.

In the first year, plants can develop leaves over 1 m wide (Anon, 1982). The dense rosette of leaves suppresses other vegetation. The plant dies down in winter then regrows in March-April from the large fleshy taproot. In the second, third or fourth year it sends up huge flat topped flower heads on a hollow stem up to 4 m tall. Plants may need to develop roots of a minimum size before flowering can occur (Tiley *et al.*, 1996).

Persistence and Spread

Seeds can remain viable in soil for 15 years (NRA, 1994). Seeds in dry-storage remain viable for up to 7 years (Tiley *et al.*, 1996).

Giant hogweed out-competes other vegetation due to its size and forms pure stands that expand from year to year if not controlled. The flat seeds are dispersed by the wind, water and by man (Anon, 1982). The removal and transport of seedheads for use in flower arrangements has aided dispersal (Tiley *et al.*, 1996). Normally, most seeds fall around the parent plant. Seeds from plants growing on riversides are carried downstream and deposited further along the riverbank. Infestations often begin as a single plant that sets seed and soon forms a small colony.

Management

Control must begin with the prevention of seed spread but already seed present in the soil seedbank will continue to emerge for 3-4 years (Anon, 1982). Seedlings and young plants can be hand pulled, larger plants can be cut down to ground level or may be dug out but full protective clothing must be worn to prevent any contact with the sap. The taproot should be cut 8-12 cm below ground level (Weber, 2003). Cutting at or above ground level encourages vigorous regrowth (NRA, 1994). Plants should be cut every 2 weeks in spring. It is not advisable to attempt cutting plants that are taller than 1.5 m. Bare areas of soil left after removal of the weed should be sown or planted with native vegetation to help prevent recolonisation by the giant hogweed.

On agricultural land ploughing will destroy seedlings (Tiley *et al.*, 1996). However, the roots of large plants may regrow.

Cattle, sheep, pigs and goats can graze the plant with no apparent ill effects (Tiley *et al.*, 1996). Grazing should begin in mid-March and continue through the growing season (NRA, 1994). Growth is suppressed but rotational grazing does not kill the plants. Pig foraging should eradicate the plant through root damage.

Giant hogweed is attacked by a number of insect species but none do sufficient damage to be useful as potential biological control agents (Tiley *et al.*, 1996). Snails graze the plant. Fungal pathogens also infect the plant including powdery mildew (*Erysiphe heraclei*) and various soft rots. Three fungal pathogens from Russia have been identified as potential biocontrol agents including *Phloeospora heraclei*, *Septoria heracleicola* and a new species of *Ramulariopsis*. *Melanochaeta asteorae* occurs on giant hogweed in the UK but causes little damage (Fowler *et al.*, 1991).

Legislation

In the UK, it is an offence under Section 14, Schedule 9 of the Wildlife and Countryside Act, 1981 to plant or cause giant hogweed to become established in the wild (HMSO, 1994).

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