



Centre for  
Ecology & Hydrology

NATURAL ENVIRONMENT RESEARCH COUNCIL

Centre for Aquatic Plant Management

## Information Sheet 4: Giant Hogweed

Giant Hogweed, *Heracleum mantegazzianum* Sommier & Levier, was introduced into Britain in the 1893 as an ornamental plant. It escaped from domestication and is now colonising many areas of waste land and river

banks. It can grow to 5m high and has a large umbel of white flowers from which it produces 30 to 50,000 viable seeds per year. When these seeds fall into water they are dispersed downstream and washed up along the bank, often on scoured bare sediment, allowing the plant to spread rapidly along watercourses. In a natural state, the plant is biennial, growing from seed in the first year and flowering in the second season. However, if the plant is cut down before it produces

seed, it will survive into a third or subsequent season, attempting to flower each year. It can form dense colonies which suppress the growth of native plants and grasses and leave the banks bare of vegetation in the winter. These are then liable to erosion or to recolonisation by seeds of Giant Hogweed washed downstream onto the bare ground.



### MECHANICAL CONTROL

Hand cutting should never be undertaken unless the operator is wearing full protective clothing to prevent skin contamination by the sap. Machine operators should take similar precautions because the sap can be spread onto machinery and subsequently come into contact with skin. Cutting before flowering will, at best, produce only temporary control and ensures

that the plant regrows in the following season. Cutting after flowering has no benefit once the seeds have been formed, except to clear away the dying vegetation. Small infestations can be controlled by digging out the whole plant. It is possible that large infestations may be controlled by deep cultivation (ploughing) although this has not been tested and is generally impractical on river banks. Cutting through the stem must be done below ground level to ensure damage to the rootstock and to prevent regrowth from the base.

### WARNING

The sap of giant hogweed contains a toxic chemical which sensitises the skin and leads to severe blistering when exposed to sunlight.

THIS REACTION CAN RECUR FOR MANY YEARS.

## CHEMICAL CONTROL

The only herbicide which is known to control Giant Hogweed and which is approved for use in or near water, is glyphosate. The plants can be sprayed with glyphosate at a rate of 61 per ha when the plants are growing actively but still less than about 1 m high. This is usually in April and May. Long-lance sprayers may assist in accurate application of glyphosate to plants growing in inaccessible sites along river banks. Glyphosate can be applied as a spot treatment to individual plants, using hand-held equipment, or as an overall spray using machine-mounted spray booms. In the latter instance, total weed control of all vegetation will occur and it may be necessary to reseed the treated area with grass and other native plants. Establishing a good sward of grasses soon after treatment of the weed will help to reduce the rate of recolonisation of the area by seeds of Giant Hogweed.



## BIOLOGICAL CONTROL

None known. Constituents of the toxic sap are thought to act as feeding deterrents for many insects, although there are some specialist Lepidopteran feeders (Butterflies), whose caterpillars may offer some degree of control

## ENVIRONMENTAL CONTROL

None known, although maintaining a dense grass sward may help to reduce germination of seedlings.

## ADDITIONAL NOTES

The seeds of this plant are thought to remain viable for up to 7 years, and possibly up to 15. Once a plant has produced seed, it should be assumed that the seeds will be present in the surrounding area for at least this length of time. Control measures will only affect those plants which have already germinated and viable seed may continue to germinate each year until the seed bank is exhausted. Therefore, eradication, as opposed to temporary control for one season only, requires regular annual checks to ensure that any germinating plants are controlled before they can seed.



On river banks, seeds may be washed downstream from colonies along the river bank. Any attempt to eradicate this plant is unlikely to succeed unless control is exercised along the **whole river system**. Good examples of catchment wide control are from the Ribble Valley (EA North West) and the River Medway Project

## BEST OPTION

Spray individual plants or whole colonies with glyphosate in April or May. Reseed the area once the plants have died off. Spot treat new plants as they appear.

## SUMMARY OF TOXICITY

The toxic components (psoralens or linear furanocoumarins) of Giant Hogweed are stored as biologically active aglycones, mainly in the oil channels or ducts in the leaves, stems, roots, flowers and seeds. Therefore all sap bearing parts of the plant can produce phyto-photodermatitis (sensitive reaction to light) on contact with exposed human skin.

There are several points to note in consideration of this severe skin reaction:

- ? Contact with the cut material in sunlight produces a reaction in almost everyone. The degree of symptoms will vary between individuals, but children are known to be particularly sensitive.
- ? The cut material remains active for several hours after cutting
- ? Blistering symptoms occur after 24-48 hours post exposure, and dense post-inflammatory hyper-pigmentation is visible after 3-5 days and may persist for at least 6 years.
- ? The threshold concentration of furanocoumarins ( $10-100 \mu\text{g ml}^{-1}$ ) for a phytophotodermatitic reaction is far exceeded during the growing season. The highest concentration is in the leaves, the lowest in the stems (often the cause of mouth blisters in young children) and petioles, and the root intermediate.
- ? The mode of action in the photosensitive reaction causes damage to DNA, thus inducing cellular damage, especially in melanocytic cells. The mechanism is thought to be due to photoinduced gene suppression leading to increased melanocyte production. These mechanisms are also involved in sunlight induced skin cancer, or melanoma, but evidence suggests that furanocoumarins are unlikely to be a genetic or carcinogenic hazard to humans.
- ? High light and nitrate habitats (e.g. streamsides, roadsides and waste ground) tend to produce higher quantities of furanocoumarins
- ? The furanocoumarins are produced by the plant as a defence against insect herbivory. There may be loss of insect biodiversity in dense stands of this species, due to the presence of only specialist herbivore insects.
- ? Furanocoumarins are known to be antifungal, possibly explaining their presence in the roots. This may lead to suppression of soil fungi, essential for soil fertility.
- ? There are reports of long-term damage to ducklings that had trampled on Giant Hogweed tissue. The beaks were deformed and feet darkly pigmented three weeks after a brief exposure.

## REFERENCES

- Cooper, MR and Johnson, AW (1998), *Poisonous Plants and Fungi in Britain*, 2<sup>nd</sup> edition, HMSO, London,
- Tiley, GED, Dodd, FS, and Wade, PM (1996) Biological Flora of the British Isles. *Heracleum mantegazzianum* Sommier & Levier, *Journal of Ecology*, **84**: 297-319