



Day of the Triffids

Kevin Whitby offers you the chance to pick up basis points as he warns us of the dangers of giant hogweed...

Though not as deadly as the walking plants that feature in the plot of John Wyndham's novel 'The Day of the Triffids', the invasive species Giant Hogweed is not to be messed with. If the sap of this plant comes into contact with the skin it can cause a severe skin condition known as phytophotodermatitis. Worse still, contact with the eyes can cause permanent blindness.

Giant Hogweed (*Heracleum mantegazzianum*) is a non-native invasive species that was introduced into the UK in the late 19th century from South Asia, as an ornamental species for large gardens and estates. Soon after introduction the plant escaped and has now spread to many areas of the country. Giant Hogweed belongs to the Carrot family (known as Apiaceae or Umbelliferae), which has more than 2500 species contained in 275 genera. These include plants native to the UK such as parsnip,

carrot, celery, fennel, coriander, dill, parsley, and the poisonous hemlocks.

Giant Hogweed is listed under Schedule 9 of the Wildlife and Countryside Act 1981 which makes it an offence to plant or otherwise cause this species to grow in the wild.

What to look for:

Giant Hogweed has very large, coarsely toothed lower leaves (up to 1m long) that will squeeze out most other native plants by competing for space, light, water and nutrients. The stems are hollow, ridged with downward pointing hairs. The lower parts of the stems are thick (up to 10cm) and are characterised by dark red or purple blotches which bear stiff hairs. In the early stages of growth it can be confused with our native Hogweed (*Heracleum sphondylium*) that grows to a maximum height of 2m but when it gets above head height there is no mistaking it!

Numerous white flowers are born in large 'umbrella' shaped heads called umbels – up to 50cm across. It has been estimated that each plant can produce up to 50,000 seeds, which are dispersed easily by water or by soil movement, and can remain viable for up to 15 years.

Giant Hogweed prefers a riparian (riverbank) habitat and will readily disperse downstream to populate new ground. The seeds are carried along streams and rivers eventually establishing themselves as they wash up on fresh soil of the riverbed or bank. Giant Hogweed can also be brought onto a site through imported soils containing its seed and will grow very rapidly, sometimes reaching a height of 4 to 5 metres in a few months. The sheer size of the foliage and the vigour with which it grows quickly overpowers and displaces natural vegetation nearby.

The danger to greenkeepers and members of the public is that the sap of the Umbelliferae contain



MAIN ABOVE: Giant Hogweed – can grow to a height of 5 metres

TOP RIGHT: Large, coarsely toothed leaves

TOP LEFT: Red/purple blotched stems with stiff hairs

RIGHT: Lower stems can be up to 10cm thick



toxic substances known as 'psoralens' or 'linear furano-coumarins' which, when exuded by the plant from hairs on the leaves and stems, can cause a severe skin irritation where the affected areas become hypersensitive to sunlight.

Skin irritant reactions are known to occur with several other members of the Carrot family; notably 'strimmers' dermatitis, encountered when operators clearing long grass containing Cow parsnip (our native Hogweed - *Heracleum sphondylium*) get splattered with sap from these plants.

A similar reaction can occur with the sap of Wild Parsnip (*Pastanaca sativa*). The reason why Giant Hogweed produces the most severe skin irritant reaction is probably because the furano-coumarins are present in higher concentrations and due to the sheer size and vigour of this plant means a large quantity of sap is produced.

The toxic components of Giant Hogweed are stored 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 a harmful reaction.

Psoralens are naturally occurring substances that appear to serve a universal defensive role in some plants, having activity against; grazing animals, insects, viruses, bacteria, fungi and the germination of seeds from other plants.

The skin irritant condition caused by Giant Hogweed is a form of phytophotodermatitis resulting from contact with the toxic components of the sap in the presence of sunlight. The initial reaction to the sap usually occurs 24 to 48 hours after skin contact, so people who are not aware of the danger can become seriously contaminated without a chance to minimise the effect by washing the skin. Large watery blisters are commonly formed and the skin feels very itchy. After the blistering subsides, a dense post-inflammatory hyper-pigmentation

Claim your basis points

SELF ASSESSMENT

Use the questions below to check your understanding of this topic. Readers can claim BASIS points if the questions are answered correctly!

Circle the correct answer(s)

1) Giant Hogweed belongs to which family of plants?

a) Pea b) Rose c) Onion d) Carrot

2) What type of habitat is preferred by this weed?

a) Woodland b) Riverside c) Marine d) Heathland

3) What is the potential seed yield for each Giant hogweed plant?

a) 5000 b) 500 c) 25,000 d) 50,000

4) What type of chemical present in the sap of Giant Hogweed produces the condition known as phytophotodermatitis?

a) saponins b) alkaloids c) psoralens d) carotenoids

5) Apart from phytophotodermatitis, what other health threatening effects can arise from contact with Giant Hogweed? (more than one may apply)

a) diarrhoea b) blindness c) respiratory difficulties d) osteoporosis



becomes visible after 3-5 days and may persist for years.

It is thought that when significant quantities of furano-coumarins penetrate the skin in the presence of ultraviolet radiation, localised corruption of DNA occurs, resulting in damage to the 'melanocytic' skin cells that produce pigments to protect the body from harmful radiations in sunlight.

Those affected by this condition will become hypersensitive to sunlight and even relatively weak exposure will cause sunburn. This painful condition can persist for a number of years.

The sap can also cause an allergic reaction in the airways, causing potentially life threatening respiratory problems; if it gets in the eyes it can cause temporary or even permanent blindness, so there is a real danger of serious health risk if it becomes airborne during cutting operations.

The threshold concentration of furano-coumarins (10-100 µg/ml) for a phytophotodermatitis reaction is well exceeded during the active growing season. The highest concentration is in the leaves, the lowest in the stems.

Contact with the Giant Hogweed sap in sunlight produces a reaction in almost everyone. The degree of symptoms will vary between individuals, but children are known to be particularly sensitive. Sap leaking from cut plants will remain active for several hours. I know of one greenkeeper who was injured on the wrist by contact with sap on the outside of some items of pro-

TECTIVE clothing his staff had been using to deal with the weed on a golf course. For this reason, when the plant is identified growing in a public place it should be dealt with swiftly to prevent harm to others. On a golf course if the plant is 'in play' it should be designated as either 'temporary out-of-bounds' or 'Ground Under Repair' (GUR) to prevent golfers from slashing at the leaves/stems in search of their missing golf balls. In other areas with public access, such as parks or play areas, the weed should be isolated by roping off and a suitable warning posted nearby. Removal or control of the plant must then be carried out without delay.

CONTROL MEASURES

Complete eradication of the weed can only be achieved by controlling all sources of infestation from upstream. Seeds can remain viable in the soil for as long as 15 years so many retreatments will be required to prevent seedlings from reaching the flowering stage.

Chemical control

The most effective method of chemical control is achieved by spraying with formulations of 360g/L glyphosate such as Roundup Pro Bi-active, applied at 6 litres/ha. Plants may be sprayed as soon as they reach 1.0m in height (usually from March to early April) but due to the size and vigour of Giant Hogweed, several applications may be needed to kill

the plants completely. Watch for seedlings that germinate and grow very rapidly, spraying these before they get beyond 1.5m high.

Giant Hogweed can compete with other vegetation to such an extent that blanket spraying with glyphosate could cause serious soil erosion in winter, especially on riverbanks. In these situations it would be better to use a weed wiper or a stem injection system to apply the chemical.

If plants are well established when discovered, they can be carefully cut above ground (using full protective clothing to avoid sap contact) and then the stems injected below the first node with a 10% solution of glyphosate in water.

Mechanical Control – Full protective clothing required when cutting and handling the plant.

Flowering heads may be carefully removed by cutting before they have set seed. The whole plant can be removed by digging below 20cm and removing the crown. Alternatively make an angled cut with a sharp spade and sever the tap roots a few inches below soil level. Mechanical equipment for slashing or strimming is best avoided due to the risk from the sap.

Flower heads should be carefully placed in marked polythene bags and disposed of along with any other cut plant material, in accordance with the rules for controlled waste.

Bare soil left after removing the plants should be re-sown with a fast establishing grass seed to discourage re-colonisation.

ABOVE LEFT: Flowers born in umbels – up to 50cm across

ABOVE: Each plant can produce up to 50,000 seeds