



# Giant Hogweed Control Methods



Are you worried about giant hogweed hurting you or someone else? Is giant hogweed causing ecological damage to your environment through replacement of native plants or erosion of soil? Are giant hogweed plants limiting your access to areas where you wish to recreate (e.g. back yard, stream bank) or work in (e.g. overrunning your garden, field or orchards)? If you answered yes to any of these questions, you may be interested in learning about methods for controlling this non-native invasive plant.

A variety of control methods are available including manual and mechanical methods, as well as the use of herbicides. Some control methods are best used on small sites and others for large sites. You will have to choose the method that works best for the habitat, stage of plant growth and size of the site. In some cases a giant hogweed infestation will be best controlled using several different methods. For instance, after using methods for large scale control (e.g. plowing) for a number of years, when only a few plants remain, it may be cheaper and easier to switch to a small scale control method (e.g. cut the taproots). The final part to any control method is to plant grasses or other plants to provide competition for giant hogweed and to decrease soil erosion. Please read through all the available methods and information provided, particularly the safety instructions, before choosing and implementing the control strategy that will work best for your giant hogweed site.

In order for your control effort to be successful, you will have to ensure that no additional seeds are being introduced to the area. If your site is along a stream, you will want to coordinate with other properties upstream from your site to limit the source of seeds flowing downstream that could re-infest your site. It is very important to ensure that the giant hogweed plants are controlled before they produce seeds and that all existing flower heads are removed and disposed of safely. With no influx of seed and a few years of persistent control efforts giant hogweed plants can be eradicated.

For more giant hogweed information, to learn more about how to identify this plant or if you have other giant hogweed related questions, please refer to the DEC giant hogweed web page: <http://www.dec.ny.gov/animals/39809.html>.

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## **1. Giant Hogweed Growth & Development (Information pertaining to control)**

Giant hogweed plants are long lived perennial plants. Once seedlings emerge from seed they persist, and will overwinter, as rosettes until the plant is triggered to bolt a flower stalk. Often, the tall majestic plants seen in brochures and in the media are more than 5 years old and can be as old as 25 years. Most plants will die after producing a flower stalk, however, giant hogweed is perennial in nature and if the root has developed side shoots, they could grow new plants the following year.

Giant hogweed plants are most commonly recognized when they are mature and flowering. Since giant hogweed plants typically take three to four years before flowering, one must also look for the more numerous younger plants with large basal leaf rosettes (some with stem and leaves) when identifying plants to control. In its first few years of growth, leaves and stem of non-flowering plants will die back over the winter. After the mature plant flowers and sets seed, the whole plant including the root will die. If the flowering plants are damaged or cut above the root before the flowers open, the plant may survive a couple more years. As a rough guide, giant hogweed plants start growing in early spring, flower in June-July and set seed in August. Giant hogweed plants have a long branching taproot up to 60 cm long and 15 cm in diameter at the crown. Their large taproots store substantial below-ground resources which can give some defense against physical and chemical control practices.

The plants reproduce by seed- an average plant produces 20,000 seeds but some plants have been reported to produce over 100,000 seeds. However since most seeds fall within a few meters of the parent plant, seedlings develop under very crowded conditions and thus seedling mortality is high. The majority of the seeds (95%) are found within the top 5 cm (2 inches) of the soil layer. The seeds are dispersed short distances by wind and can travel longer distances by water (can float up to three days). Most seeds are found within 10 meters of the giant hogweed colony with a few plants traveling more than 50 meters away. The seeds can travel farther when assisted by people- improper disposal of flower heads, purposeful sharing of seeds/seedlings with other gardeners, transporting seed-laden soil during construction, mowing along roadsides, and wind currents generated along highways and railroads from fast moving vehicles may cause seeds to travel farther. Seeds may remain viable in the seed bank for more than 5 years. Since the dispersal of giant hogweed is almost entirely by seeds it is very important to prevent the plant from flowering and setting seed.

Giant hogweed plants grow best in open sites with abundant light, but can grow successfully in woodland, forest edge and partially shaded habitats too. The plants grow well in undisturbed or unmanaged sites and are less frequently found in tilled or grazed areas. Plants are resistant to frost and can withstand flooding, though they cannot grow on permanently submerged ground. With their tremendous growth, large leaf area and prolific seed production, giant hogweed plants are able to outcompete and replace native vegetation. Giant hogweed plants shade out surrounding vegetation with their giant leaves and tight growth pattern. Bare soil is created below the plants, which leads to soil erosion in winter. Bare soil, in conjunction with the loss of plants with finely branched roots able to hold the soil, is of special concern along slopes and stream banks.

Studies have found that giant hogweed invasion patterns often begin with cultivation as a garden ornamental. The spread begins slowly from these cultivated areas. Over time the giant hogweed typically spreads first along rivers or stream corridors. Once the plants become more prevalent they are able to spread throughout a variety of habitats.

## **2. Public Health Hazards & Safety Instructions**

When the clear watery giant hogweed sap, which contains several photosensitizing furanocoumarins, contacts the human skin in conjunction with sunlight (specifically ultraviolet radiation), it can cause phytophotodermatitis. This is a serious skin inflammation that may lead to painful blisters that form within 48 hours and become dark pigmentation or scars that can last up to 6 years, though typically only last a few months. Long-term sensitivity to sunlight often occurs. Blindness may occur if the sap gets into the eye.

The skin reaction will depend on the sensitivity of the individual. Heat and moisture (sweat or dew) can enhance the skin reaction. The phototoxic reaction can be activated by ultraviolet radiation 15 minutes after contact, with a sensitivity peak between 30 minutes and two hours. The toxic furanocoumarins are present in all parts of the plant: the lower parts of the hollow stems and petioles may be partly filled with fluid; the hollow hairs on the plant also contain the sap.

- Do not touch the plant with bare skin- toxicity can result from any action that involves bruising, cutting or touching the foliage, stem, flower or fruit.
- Prevent ultraviolet light from reaching the skin.
- Wear long waterproof gloves, long sleeves, pants, boots and eye protection if you plan to handle or cut down plants. Synthetic water-resistant materials are best, since cotton and linen fibers can soak up the plant sap and be penetrated by plant hairs (e.g. dishwashing gloves, rain suit, and rubber boots). Do not touch your exposed skin with the sap covered gloves! Wearing a face shield will help to keep you from touching your face with sap covered gloves.
- When multiple people are doing plant removal, make sure to work a good distance from one another. Given the sappy nature of this plant, especially the lower stem where it can pool, sap can be splashed 3-4 feet. It is important not to thrash around while digging but even careful workers will have an occasional oops, so it is best if other people are not too close.
- You may want to apply sunblock before beginning to work near giant hogweed plants.
- Launder clothing that comes into contact with plant juices.
- Wash equipment with water immediately after use.
- To be completely sure to limit your exposure to sunlight you could choose to work around giant hogweed plants after sunset.
- Do not use a “weed-whacker” or brush cutter – sap may splatter on you as stems are cut.

If accidental exposure to the plant sap occurs, wash the affected area thoroughly with soap and cold water as soon as possible. It is a good idea to keep water and soap near the work

area. Keep the exposed area away from sunlight for at least 48 hours. If a reaction occurs, topical steroids applied early can reduce the severity of the reaction and ease discomfort. If sap goes in the eyes, rinse them with water and use sunglasses. As the area may be sensitive to sunlight for a few years, you may want to apply sunblock and/or keep the affected area covered from the sun for that length of time. Please see a physician if you have a reaction or have any questions.

### **3. Manual & Mechanical Control**

Manual and mechanical control methods include root cutting, cutting the plant, covering the soil, mowing, plowing and removing the umbels (flower heads). Except for root cutting, manual control will not cause immediate death of the plant. All other methods will need two to three treatments per year for several years to deplete the root reserves and kill the plants. All methods will need to occur for multiple years until no new plants grow from the seed bank. Monitor the site for at least three more years to make sure no new seedlings appear.

#### **a. Cut or dig up roots**

This is a labor intensive but very effective method which will typically kill the individual plant after one treatment. It is ideal for a single plant or small infestations of less than 200 plants (1-2 hours for two people). This method can also be used for larger infestations if you have more time and/or people. If no seeds are produced in 2-3 years, it is possible to clean an area in 3-5 years by root-cutting every year until no more plants are found.

Cut the taproot approximately 6 inches (15 cm) below ground level using a spade with a sharp blade. Some people have reported success with cutting the plants only 1.5 inches (2-3 cm) below the soil surface. In areas with erosion or on steep inclines, where additional soil may be covering the plant base, plant taproots may need to be cut up to 10 inches (25 cm) below the soil surface. When cutting the root you need to separate the thick stem base bearing old leaf scars, from the root below. The stem base can be covered with up to 2 inches (5 cm) of soil. It is easiest to cut in early spring before the leaves are very large. If the plant does not die, cut again in mid summer. The cut part of the plants should be pulled out of the soil and can either be removed for disposal or left to dry.

To make this control method even more effective, return to the site 1-2 weeks after the initial root-cutting. Cut or dig up the roots of any giant hogweed plants that were missed the first time (or spray plants with herbicide), and remove any giant hogweed seedlings that have started to grow. When using the root-cutting method, another option is to apply herbicide to the cut root remaining in the soil, to help ensure no part of the root grows back the following year.

Instead of root-cutting you can also choose to carefully dig up the roots and allow them to thoroughly dry before disposal.

**b. Hand pull**

Young plants can be easily hand pulled (April-May). This is easiest to do when the soil is loose and moist. As the stems are not woody, they will break easily so it is best to pull them gently to ensure full root removal. Using a trowel or other small hand tool may help to ease them out of the soil. Pulling will not work for mature plants as the tap root is too large.

**c. Remove hogweed flowers (flower head, inflorescence, umbel) & dispose safely**

Removal of the flower head can be as effective as cutting the whole mature plant. The plant is going to die after flowering but cutting off the flower head is VERY important to keep it from spreading the seed. Timing of the cutting is crucial, if cut too early the plant can regenerate and produce new flowers with more numerous viable seeds. Cutting off the flower heads after the seeds have formed but before they mature will prevent the plant from shedding the seeds and prevent the plant from forming new flowers on lower branches (if cut while flowering new umbels may form). If you do cut the plant in the flowering stage make sure to check the plant again in a few weeks to cut off any new flower heads that may form. As the seeds mature they shed more easily. When cutting the flower head try to avoid scattering seeds on the ground; if seeds are shedding, contain them within as small an area as possible.

A cut and hold long reach pruner is the ideal tool for flowerhead removal, but any sharp cutting tool which is long enough so that you won't touch the plant can be used. Use the pruner/lopper/knife to carefully cut off all flower heads and place them in sturdy (or doubled/tripled) trash bags. Since the seeds may mature on the severed flower head, they must be carefully disposed of. Clear trash bags are best for solarization (a method of using the heat from the sun to destroy the seed viability) but dark bags are suitable as well. Seal trash bags tightly. If possible place in a secure location where they will be exposed to direct sunlight to give flowers and seeds a heat treatment (solarization) for 1 week or more. This should help destroy seed viability. Then dispose of trash bags in the garbage.

**d. Plowing**

Plowing is often one of the single best methods of mechanical control for giant hogweed, though it will have to be done for multiple years as large roots are capable of regrowth. This method eradicates the plant from infested fields and if done in the fall, frost and freezing temperatures will help degrade the root stock. Large roots should be hand removed from the plow zone to ensure no regrowth occurs. Deep plowing of the soil will significantly reduce the germination of hogweed seeds due to the upper soil layer being buried (most seeds are within the top 2 inches (5 cm) of the soil). The best results are obtained if the plants are controlled mechanically or chemically before plowing. Make sure to clean the plowing equipment before using in another area to avoid spreading giant hogweed seeds to new locations.

**e. Cutting & Mowing**

Cutting plants above ground is not recommended as an eradication method. If you choose to use this method, the plants must be cut at least two to three times per growing

season for several years until the taproot energy reserves are depleted. In the beginning of this process the plants will typically grow back within a couple of weeks after being cut. Repeated mowing is often used for large infested areas and if done consistently and on a regular basis can destroy most of the plants, scything can be done in areas unsuitable for mechanical mowing, such as along riverbanks or on slopes but will not be effective in killing the plants. Be careful not to spread the seeds; all flower heads should be removed and carefully disposed of (read part 3.c.). If possible remove the plants; if they are placed in piles they will shade out the vegetation below and create favorable habitat for hogweed plants. Use care when cutting the stem- you will want to find or design a tool that allows you to cut the stem without touching the plant, splattering sap on yourself, or cutting yourself. Mowing equipment should be cleaned on site before using in another area to avoid spreading giant hogweed seeds to new locations.

**f. Cut and cover**

This is an effective method when done correctly. It is recommended for use in small areas. It will keep plants from regrowing and prevent the seedlings from emerging. Cut the plants down to ground level and cover the soil with black plastic. Check the following year to make sure seedlings don't poke through the black plastic. After a few years the plastic can be removed and the area revegetated with native or non-invasive plants.

**g. Bury plants & seeds using a skid loader**

This is a very effective method. Use a skid loader to invert the flower bed or infested area upside down and you will have composted and smothered most of the plants. Since the majority of the seeds (95%) are found within the top 5 cm (2 inches) of the soil layer, the emergence of new plants is prevented by burying the topsoil to a minimum depth of 20 inches (50 cm) and covering it with clean soil. It is important to clean the equipment used on site before using in another area to avoid spreading giant hogweed seeds to new locations.

**4. Herbicide Control**

Giant hogweed is susceptible to systemic herbicides, such as glyphosate and triclopyr, and the application of these herbicides is considered effective and cost efficient. Herbicide application can be used for controlling a single plant or large stands of giant hogweed. These systemic herbicides will be absorbed by the leaves and will move into the root to prevent regrowth the following year. Triclopyr is a selective herbicide that acts only on broadleaf plants and will not harm grasses in the area. Glyphosate is non-persistent in the soil but is also a non-selective herbicide and will kill any surrounding vegetation it comes into contact with. Some triclopyr (e.g. Garlon 3A) and glyphosate products (e.g. Rodeo) are labeled for use in riparian areas and near water. Areas sprayed with triclopyr can recolonize with grasses and other herbaceous species within the same growing season which helps to suppress giant hogweed seedling growth and decrease soil erosion. Recolonization at sites using glyphosate will probably be slower than sites using triclopyr unless reseeded. Spray giant hogweed leaves with an herbicide containing triclopyr or glyphosate as the active ingredient. Use the recommended manufacturer's dose and follow label instructions- there is no advantage to using a higher dose. Apply the herbicide between March and early

June when hogweed leaves are green and actively growing. A follow-up treatment, in July or August, may be needed for the plants that did not die from the first herbicide application (e.g. seedlings, now leaf rosettes, which were once covered by leaves of the plants originally sprayed). During this follow-up treatment it is strongly recommended to remove any flower heads present to decrease next year's seed source (Read part 3.c.). It is easiest to spray before the plants grow overly tall. For your safety- do not spray the plants above your waist. If the plants are too tall, cut them down to ground level and spray the regrowth. Another option is to carefully cut the plants above waist height and spray below. To be successful in eradicating giant hogweed, herbicide treatments (or another control method) will have to be repeated for a few years, in order to kill the plants missed the prior year as well as the plants emerging from the seedbank.

Spray during dry and calm weather. Cover leaf surfaces thoroughly with spray droplets, but do not spray to the point that liquid is dripping off the leaves. Do not apply herbicide to non-target organisms as you want the other plants to live and revegetate the area. Be patient, it may take plants treated up to one week or more depending on moisture levels before symptoms appear. Do not cut or dig up the plant until the top growth has died back. If the leaves remain green several weeks or a month after the initial treatment, spray them with herbicide again.

For licensed pesticide applicators, there are two herbicides that are legal for specific use on giant hogweed due to FIFRA 2(ee) Recommendations: Rodeo (EPA Reg. No. 62719-324), which contains glyphosate, and Vegetation Manager Triclopyr 3 SL (EPA Reg. No. 72167-49-74477). A copy of the FIFRA 2(ee) Recommendation letter as well as a copy of the herbicide label needs to be carried by the applicator when applying herbicides. The 2(ee) recommendations can be downloaded at the PIMS web site: [http://pmep.cce.cornell.edu/regulation/nysdec-lib/2ee/hab\\_herb\\_index.html](http://pmep.cce.cornell.edu/regulation/nysdec-lib/2ee/hab_herb_index.html). Both herbicides are classified as restricted and can only be applied by, or under the supervision of, a certified commercial pesticide applicator. Rodeo can be applied in and around aquatic sites. Vegetation Manager Triclopyr 3 SL cannot be applied in standing water or in open water.

## **5. Monitor**

Reports suggest that Hogweed seeds can remain viable in the soil for 15 years so long-term monitoring is important. Check the site and surrounding areas for the next several years for the emergence of any hogweed seedlings or regrowth from previous year's plants. Following control methods above, existing giant hogweed rosettes should be eradicated from most sites within 3 to 7 years. Seed bank longevity is dependent on soil conditions and the number of years viable seed was produced.

## **6. Revegetation**

This step is very important. After removing giant hogweed plants you may be left with an area of bare soil vulnerable to soil erosion, giant hogweed seedlings, and introduction of other invasive weeds. Re-establishment of native or non-invasive vegetation (e.g. through sowing of grass mixtures) at treated sites may be necessary to help achieve your desired

control outcome. This will help to reduce soil erosion and provide competition for giant hogweed seedlings.

## 7. Overall Giant Hogweed Control Strategies

- Prevent introduction into new areas.
- Do not move soil contaminated with seed. If removal of contaminated soil is necessary, seedling emergence can be prevented by burying the soil to a minimum depth of 20 inches (50 cm) and covering it with clean soil.
- Sowing and planting of giant hogweed should be prohibited.
- Since the dispersal of giant hogweed is almost entirely by seeds it is very important to prevent the plant from setting seed.
- Control new, smaller infestations first before the seed bank has a chance to establish.
- Locate and map distribution of all populations.
- Focus on populations on the margin of range expansion as a way to slow or prevent further invasion.
- Target populations along rivers and streams and urban stormwater systems. Coordinate throughout the entire drainage system. Sites upstream should be controlled first, since seeds will be dispersed downstream.
- Stands along transportation corridors (railroads, highways) should be managed to prevent dispersal of seeds. Seeds get blown by air currents from fast moving vehicles or trains and can also be spread by maintenance practices.
- Educate the public to help locate giant hogweed populations, prevent spread, and control plants on their property.

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