



***Heracleum mantegazzianum* invasion in Sweden, Ireland, and Scotland**

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What once was considered a beautiful ornamental garden plant, brought to Europe from Western Caucasus, is now considered an invasive weed. The plant is *Heracleum mantegazzianum*, or Giant Hogweed. Once established, *H. mantegazzianum* is able to out-compete native plants by shading them with its huge ground leaves. The combination of high seed counts and seeds that are easily dispersed by wind, water, and human factors, has allowed the weed to spread rapidly. Seeds are easily transported along rivers, roads, railways, and wastelands. Most outbreaks that have occurred in Europe have been in the Czech Republic, Sweden, Scotland, and Ireland (Pysek, 1994). This paper will focus on the reasons for controlling *H. mantegazzianum* and also the control methods attempted in Scotland, Ireland, and Sweden.

Reasons for controlling *Heracleum mantegazzianum*

H. mantegazzianum must be controlled in Europe in order to provide access to waterways for recreation, fishing, and conservation areas. *H. mantegazzianum* poses a threat to human safety because its sap contains furocoumanins that cause phytotoxicity (Caffrey, 1994). When the sap comes into contact with human skin it causes large blisters and hyper-pigmentation. In some cases the sap will cause the skin to be sensitive to ultraviolet A radiation (Powell, 1988). This is most common when areas of the skin are exposed to sunlight. Blisters may occur for many years after the first irritation appears.

Riverbanks must also be protected from *H. mantegazzianum* because the weed leaves the soil bare in the winter due to annual die back and this bare soil is left to erode into the river. One must be careful when moving *H. mantegazzianum* off site because the seeds are easily spread along roadways and riverbanks.

Scotland

In Scotland, 150 sites were chosen in order to test control methods for *Heracleum mantegazzianum* (Tiley, 1994). Of the 150 sites, half were along riversides and the majority of the other half were along roadsides and wastelands.

Control methods included cutting to the ground and spraying re-growth with glyphosate in spring and summer, spraying only with glyphosate (sometimes with more than one application), and mechanically cutting the stems. Success rates varied with each control method.

The first method may be harmful to the operator if the plant sap comes into contact with the skin. Cutting the weed while it is producing seeds will increase the plant in the area because seeds are dispersed during removal. Spraying with glyphosate after the plant was cut was shown to be relatively successful.

The second control method, spraying with glyphosate only, was successful in all areas. The rates of application varied on the plants with some plants needing to be controlled with more than one application. There were few stands of *H. mantegazzianum* after the applications of glyphosate.

Mechanically cutting the stems for the third control had poor success rates at all sites. The plants re-sprouted after being cut and grew to full sized plants. These plants were allowed to set seed and the spread of the weed continued. The authors of the study provided no discussion about what sites, if any, had better success rates with the control methods.

In addition to physical control efforts, legislative controls also show promise for eliminating *H. mantegazzianum*. Eight Scottish councils want to classify *H. mantegazzianum* as an injurious weed requiring eradication (Tiley, 1994). Britain has classified this weed under the Wildlife and Countryside Act of 1981. This act states that "it is an offense to plant or otherwise cause [*H. mantegazzianum*] to grow in the wild." Classifying the weed under the Wildlife and Country Act has reduced the spread of *H. mantegazzianum* in Britain because homeowners rarely plant it as an ornamental. Scotland needs to have similar classifications to reduce the spread of the weed.

Ireland

Ireland has also had problems with *Heracleum mantegazzianum* invading riverbanks and streams. The invasion has caused erosion along the riverbanks because of the annual die back of the weed, which leaves the soil bare (Caffrey, 1994). The weed has also been found to grow best in unmanaged and disturbed areas found in the wild.

Ireland has tried three treatments to control the weed (Caffrey 1994). These methods included, spraying glyphosate in the form of Roundup in April, May, and July of 1991, spraying with triclopyr/clopyralid in the form of Grazon 90 in April and May of 1991, and cutting the weed to the ground in May and July of 1991. Glyphosate has been approved for use along waterways where as triclopyr/clopyralid has not been approved and was used at other non-riverine sites

The results of Ireland's efforts showed that with the chemical applications there was an almost 100% success rate. There was no re-growth of the weed in the 1991-growing season after the applications occurred. At the triclopyr application sites, grass grew in the areas that were sprayed in 1991. In May of 1992, grass and other herbaceous plant material re-growth covered the area where triclopyr was sprayed. After the triclopyr application this area had very little reoccurrence of *H. mantegazzianum* in the subsequent growing seasons. This method has been considered successful because native vegetation grew back naturally in place of the invasive and foreign *H. mantegazzianum*.

In 1991, no growth of other plants occurred at the glyphosate sites because the chemical is non-selective. Erosion along the riverbanks occurred because no vegetation held the soil in place. In May of 1992, the glyphosate site had other plants such as *Ranunculus ficarea*, *Rumex* spp., *Urtica dioica*, *Anthriscus sylvestris*, *Heracleum sphondylium*, *Hedera helix*, and various grasses (Caffrey, 1994). Soil erosion along the riverbanks stopped after the re-growth of native vegetation.

The cutting method had low success rate because of rapid re-growth after the cut was made which allowed seeds to set and germinate. In March of 1992, the cut areas had moderately dense stands of *H. mantegazzianum*.

Sweden

Sweden has experimented with different spraying equipment to control the weed (Lundstrom and Darby, 1994). The first tool is called an L-stamper with an artificial sponge for vertical application. This tool is for selective use on rosettes or as a wiper for a leaf turner. The second tool is a collapsible leaf turner used to lift the underside of the leaf before spraying. This can be used as a hand sprayer and is effective in wet weather. The third tool is a tube sprayer used as a hand sprayer. The tube reduces the spray drift so that other vegetation within close range to the weed is not hit.

Researchers in Sweden came to the conclusion that if *H. mantegazzianum* was going to be sprayed with any chemical one would need to spray at least two times in a growing season and "total control is usually only achieved after many years of spraying" (Lundstrom and Darby, 1994). Testing with cutting the weed has also taken place in Sweden. It is not feasible to cut large stands by hand because of the expense and the danger of phytotoxins in the sap. If the plants are cut they should not be moved off site because the seeds will be lost and will grow in other sites.

The authors provide no discussion on the success rates of the equipment mentioned above, but the public in Sweden opposes the use of herbicides as a control method. Eradicating the weed remains a significant problem. Even so, farmers are being paid by local authorities to spray the weed along riverbanks with glyphosate (Lundstrom and Darby, 1994).

Sweden is also considering legal provisions against the plantings of *Heracleum mantegazzianum* like the Wildlife and Countryside Act of 1981 in England to prevent spread of the weed (Lundstrom and Darby, 1994). So far, it is not illegal to plant *H. mantegazzianum* and invasions are likely to continue until the weed is classified.

Conclusion

Scotland, Sweden, and Ireland have tried similar methods to control *H. mantegazzianum* because of the similar growing habitats of the weed in their countries. *H. mantegazzianum* has been found growing along waterways, railways, wastelands, and roads in all three countries. *H. mantegazzianum* grows best in these highly trafficked areas and remains persistent because seeds may remain viable up to 7 to 8 years (Robson, 1998).

Studies from all three countries came to the conclusion that cutting the weed is unsuccessful because of immediate re-growth of the plant, which is then able to set seeds. Mechanically cutting the weed also has been proven expensive in all three countries.

Spraying with glyphosate or triclopyr has been successful in Scotland and Ireland. There have been relatively small stands of *H. mantegazzianum* re-growth occurrence in these countries compared to the cutting control method.

While spraying of the plant with either glyphosate or triclopyr helps prevent re-growth, invasions still occur because these countries have not taken steps similar to the Wildlife and Country Act of 1981. These steps would prevent people from planting *H. mantegazzianum* and prevent the spread of the weed. Scotland, Sweden, and Ireland authorities should take this into consideration if they want to cease the spread of this weed.

Literature Cited

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