

Herbicide Overview

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In recent years the availability of herbicides in the UK has slowly declined due to concerns regarding environmental and non-target damage that may be caused by, typically, improper use. Furthermore, as professionals we have a duty of care to select an appropriate herbicide for the correct scenario. This technical report aims to provide an overview of some of the most common herbicides that are available to arborists as well as their uses.

Roundup/ Gallup a.i. Glyphosate non-selective systemic

Glyphosate is a non-selective systemic herbicide that is effective against a wide range of broadleaf and grass species but not mosses. The mode of action is systemic: the product is taken up by the leaves and is transported to the growing points of the plant (figure 1). Death can take 4-20 days depending on the dose and plant growth stage. Therefore, the product is best applied once the leaves have fully emerged and are actively growing. Although glyphosate doesn't remain active in the soil for long (average half-life 12 days) its major breakdown product AMPA takes longer to breakdown and can still have detrimental effects on trees.

Glyphosate is recommended for ground clearance prior to tree planting and for general use. A higher concentration may be required to control hardier weeds (brambles, thistles, docks) with multiple applications needed. Certain glyphosate products are some of the few herbicides that may be approved for used in and near water courses (always check product label).

Glyphosate is highly effective against Japanese Knotweed (*Fallopia japonica*) when used as part of an eradication program.



Figure 1: Low level glyphosate damage.

Finalsan a.i. Organic Pelargonic acid non-selective contact

Pelargonic acid is a naturally occurring acid found in, for example, grapes and apples; this makes pelargonic acid an organic alternative to synthetic herbicides. Pelargonic acid is classified as a non-selective contact herbicide which means that it destroys all green plant matter that it comes into contact with but is not transferred around the plant and thus the root system is unaffected by this product (figure 2). This is advantageous for killing annual weeds in pots and around the base of trees, chemically removing suckers, and against mosses. Perennial/woody weeds will take multiple applications to control, and it may be more practical to cut the woody growth down to the base and treat the non-woody regrowth. Annual weeds look visibly burned within one hour and defoliation takes on average 7-10 days depending on temperature, and the size and species of the weed. For optimum control of annual weeds, spray before flowering.

When pelargonic acid is used in combination with glyphosate, a dual kill effect can occur where both a rapid burn of the green plant matter and death of the root system occurs.



Figure 2: Weeds sprayed with Pelargonic acid show symptoms of wilt and a colour change in the foliage that progresses from green through blue/grey and finally brown.

HY-D Super/ Depitox 500 a.i. 2, 4-D selective

2, 4-D is a selective herbicide that is used to control a wide range of broadleaf weeds on amenity turf i.e. to maintain a weed-free lawn. 2, 4-D mimics the plant hormone auxin and causes uncontrolled growth that leads to death. Some less-susceptible broadleaf species will require a higher dose rate and multiple applications. To ensure that the best level of control is achieved, the product should be applied once the leaves have fully emerged but before flowering. Hardier weeds such as bramble, docks and thistles are unlikely to be effectively controlled by 2, 4-D. The soil activity is quite short (average half-life 10 days) depending on environmental conditions.

2, 4-D is not likely to cause significant tree damage unless used on a too frequent basis: shallow rooted species and deciduous hardwoods (i.e. Japanese Acer, *Malus*, *Sorbus*, and Beech) are particularly susceptible. To avoid non-target damage, ensure that there are no more than 3 applications per year and that there are at least 28 days between each application. In addition, it is recommended to avoid applying this herbicide on hot days (>26°C) since the product may turn into a gas and damage nearby tree foliage (figure 3).



Figure 3: Selective herbicide damage.

Blaster Pro a.i. Triclopyr & Clopyralid selective

Triclopyr and Clopyralid are also selective herbicides that mimic the plant hormone auxin and are used to control broadleaf weeds. The combination of these two active ingredients in Blaster Pro enables the control of hardy weeds such as common nettle, docks, thistles, ragwort, and bramble. If applying this product within a lawn, do not cut the grass 2-3 weeks prior to spraying and then allow the weeds to die before cutting again i.e. do not cut the grass for 28 days after application. This provides optimum control of the weeds and minimal disturbance to the lawn. The death of the top growth usually occurs in 3-5 days. Very occasionally the grass may yellow after spraying but this is temporary and is quickly outgrown. All weeds should be treated when they are actively growing but specifics can vary, read the product label for details.

Both active ingredients have longer higher soil activity: average half-life 40 days and 30 days for clopyralid and triclopyr respectively. Clopyralid is highly mobile in soil so care is required to avoid contamination and non-target damage.

Non-target tree damage can be severe and may result in mortality if enough of the product is taken up. Nitrogen fixing trees (alder, laburnum, black/ honey locust) are particularly sensitive to damage through root up-take. Consequently, it is not recommended that this herbicide be used under the canopy of non-target trees (figure 4).

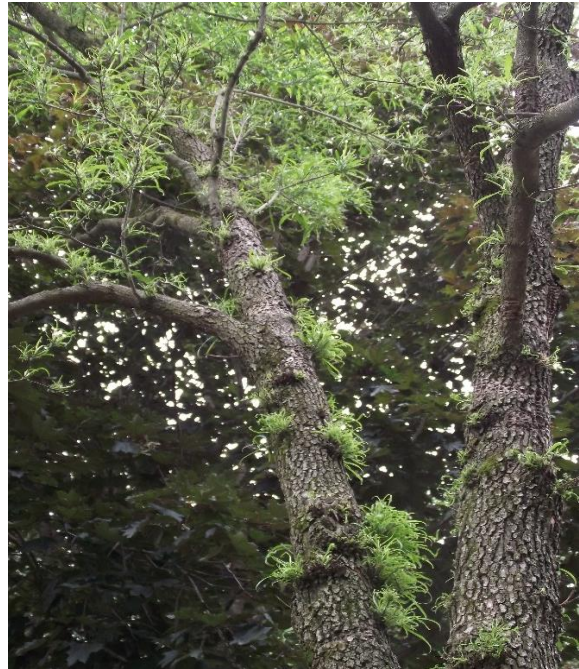


Figure 4: Selective herbicides often mimic plant hormones. As a result, trees affected by selective herbicides can produce tufts of distorted growth across the whole tree or in a localised area.

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