



# Herbicides: What are they?

**FACT SHEET 1**

*Michael Hughes, DAF, August 2020*

Herbicides are chemicals that kill or stunt plant growth. In sweetpotato farming systems, herbicides are used to control weeds, volunteer sweetpotatoes after harvest and to spray off cover crops.

Herbicides are an important tool, but not the only one in a grower’s armoury to control weeds and volunteers. They are generally most effective when used within an integrated weed management program (IWM). IWM is a farm or area developed long-term weed management system, using several complimentary control methods for weed management. Understanding of the weeds biology and ecology and the system being economically viable are all important aspects of IWM.

Herbicides can be in the form of **liquids**, **powders** or **granules**. They are comprised of:

**Active ingredients** are the chemical component/s that will kill the target plant/s when applied at the correct rate. The active ingredient/s kills by one of the following:

- Chemically disrupting a plant process (e.g. photosynthesis), causing the plant to die.
- Desiccating (drying out) the plant.
- Defoliating the plant.

**Inert ingredients** which can include solvents or adjuvants, and which:

- Enable the small quantities of active ingredient to be evenly spread over larger areas.
- Enhance effectiveness of the herbicide, by improving mixing and handling characteristics.
- Improve storage life of the herbicide and protect it from harsh environmental conditions.

May include colour and/or odour additives to discourage people from eating or swallowing the herbicide.

## Herbicides can be classified as:

<b>CONTACT</b>	<b>OR</b>	<b>TRANSLOCATED</b>
<p>Contact herbicides kill plant tissue around the spray droplet.</p> <p>They do not move around the plant. For this reason, it is essential that good even spray coverage of the target plant is made.</p> <p>Plant damage symptoms are usually seen within 24 hours (e.g. paraquat, acifluorfen).</p>		<p>These herbicides are absorbed into plants via leaves, (sometimes stems) or roots and move through the plant vascular systems. Xylem moves water and nutrients from the roots to the upper growing points.</p> <p>Phloem transports photosynthetic products (sugars etc.) to the growing points and storage sites (sweetpotato roots).</p> <p>Plant damage symptoms may take two weeks to appear (e.g. glyphosate).</p>
<b>RESIDUAL</b>	<b>OR</b>	<b>NON-RESIDUAL</b>
<p>These remain active in the soil. Some herbicides have short residuals while others are lengthy (e.g. simazine, atrazine).</p>		<p>Bind to soil particles and break down quickly (e.g. 2, 4-D, glyphosate).</p>
<b>PRE-EMERGENT</b>	<b>OR</b>	<b>POST-EMERGENT</b>
<p>Applied to the soil before weeds have emerged (e.g. Metolachlor, EPTC).</p>		<p>Sprayed onto leaves and stems of weeds that have emerged from the ground, (e.g. Sethoxydim).</p>
<b>SELECTIVE</b>	<b>OR</b>	<b>NON-SELECTIVE</b>
<p>Kill a specific range of plants (target weeds) and not the crop plants.</p>		<p>Kill a wide range of plants including the crop plants.</p>



Similar to insects, weeds could develop resistance to herbicides if they are repeatedly sprayed with the same type of herbicide.

- To avoid herbicide resistance developing, practise IWM, involving chemical, non-chemical (tillage, rod weeding, rouging, cleaning of machinery to stop weed seed spread, etc.) and agronomic techniques (crop rotation, narrow row spacing of grains or green manure crops in the rotation, use of stale seedbeds) of weed control.

Herbicides are grouped by their **mode of action**. This is how the active ingredient of the herbicide affects the biochemical pathways in the plant.

- Herbicides with similar modes of action are grouped together. In Australia, there are **19** mode of action **groups**. These groups are identified **alphabetically** (e.g. Group I are 'disrupters of plant cell growth [Synthetic Auxins]'. These include benzoic acids such as dicamba and phenoxy carboxylic acids such as 2,4-D).
- The **mode of action group** is shown on the herbicide **label** directly under the **herbicide name** and **active ingredient**.

Some herbicides comprise of a **combination** of active ingredients, so may belong to **more than one** mode of action group. To avoid the risk of weeds developing herbicide resistance, if possible, when using herbicides rotate between the mode of action groups.

**NOTE: Other countries use different classification systems, some alphabetical.**

**Be aware if researching online.**

**The advice in this factsheet is general in nature. Always use registered products according to their approved instructions.**

## Resources:

Australian Pesticides and Veterinary Medicines Authority (APVMA) 2011. *Understanding Pesticide Chemical Labels*. [apvma.gov.au/sites/default/files/images/understanding\\_labels\\_booklet\\_2.pdf](http://apvma.gov.au/sites/default/files/images/understanding_labels_booklet_2.pdf).

GRDC (2017) *Grownotes™ Technical: Herbicide Use*. Grains Research and Development Corporation (GRDC).

*Weeds in Australia*. <https://www.environment.gov.au/biodiversity/invasive/weeds/index.html>

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