PRACTICALITIES

When discussing weed control, we are often asked whether a wetter or a penetrant should be added to the herbicide – sometimes it is assumed that the two terms are interchangeable. DAFWA's Rod Randall explains:

WETTING AGENTS, PENETRANTS, AREN'T THEY THE SAME THING?

Rod Randall

No they're not, they have very separate jobs to do and do them in very different ways.

Penetrants

Essentially a penetrant is any component, or additive, of a herbicide mix that aids the movement of the herbicide into the plants' internal tissues. Some of the best penetrants are highly toxic in their own right and others are used by people all the time in a range of products such as summer spraying oils, kerosene and diesel fuel.

Penetrants are useful when plants have waxy leaves or the leaves are covered with some sort of resinous barrier that resists herbicide uptake, hence many common penetrants are organic solvents such as miscible light oils. They are commonly added to herbicides sprayed on cacti, succulents, many bulbous species and numerous other plants. The manufacturer's label would recommend when, and what type, of additives are required depending on the species being treated.

Used in insecticides there is a group of additives called adjuvants that increase the uptake of the toxin into insects. Like penetrants these adjuvants increase the efficacy of the toxin by improving the speed of the toxin moving into, and through, the insect's body. An adjuvant commonly increases an insect's physical activity making them buzz their wings fiercely or crawl frantically. This increased metabolic activity dramatically improves the movement of the toxin into the insect killing it much faster and with lower doses of the toxin required. Commercial insect sprays commonly contain these adjuvants. The reverse principle applies to a snake bite victim where the first aid is to keep the victim still to prevent movement of the toxin internally.

Wetting Agents

Wetting agents are essentially just concentrated detergents that reduce the surface tension of the water used in the herbicides allowing the spray droplets to disperse across the surface of the plant's leaves and stems. This increases the amount of the plant's surface area exposed to the herbicide and kills it more effectively.

Wetting agents are good for getting past plant defenses like hairy leaves where ordinarily the droplets might get stuck on the leaf hairs and harmlessly evaporate away never moving close enough to the leaf surface to be absorbed. Wetting agents, or dispersants, allow the droplets to just slide down the hairs and move onto the leaf surface. They also work well with very shiny leaves allowing the droplets to disperse across, rather than roll off, the leaf surface.

The manufacturers label will generally advise if a wetting agent is required with certain herbicides to increase their efficacy. Because some herbicides may be ionic or non-ionic in nature (chemically charged at a molecular level) the manufacturer may recommend a particular type of ionic or non-ionic wetting agent. Be careful to always use the recommended type or your spray efforts may be all for nothing.

So the two are not the same. Wetting agents disperse the herbicide across the leaf material while penetrants aid in the movement of the herbicide into the plant tissue. Occasionally both processes may be needed to obtain good effects in a spray operation depending on the species being controlled. Some wetting agents will aid in penetration of the herbicide and the reverse can also be true but that's a bonus if it occurs. Always remember that when designing your spraying program you should always consider if a wetter and/or a penetrant is needed to do a good job.

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INVASIVE PLANTS AND CLIMATE CHANGE

The characteristics of the most successful weeds mean that they invade new areas rapidly after a major disturbance event. Climate change can be expected to favour invasive plants over established native vegetation, especially if accompanied by extreme conditions such as droughts alternating with very wet years. All invasive plants can be expected to demonstrate a southward range shift. Sleeper weeds may be favoured by changing climate.

For further information, find the Briefing Note on this on the Weeds CRC's website: www.weeds.crc.org.au