REGLONE®

Pre-harvest weed control and crop desiccation

REGLONE® is a non selective contact herbicide containing 200g/L diquat present as diquat dibromide monohydrate. It is fast-acting non-volatile, aqueous solution, providing unrivalled speed of kill in the destruction of green plant tissue. REGLONE interferes with the process of photosynthesis, causing rapid desiccation of foliage for pre-harvest weed control or crop desiccation.

Mode of action

Light and green leaf tissue are essential components to the activity of REGLONE. The herbicide acts as a catalyst in the chloroplasts of plant cells, interfering with the process of photosynthesis at Photosystem I. The active ingredient diquat, diverts electron flow causing the production of peroxides and free electrons. These superoxides attack proteins and cell membranes, ultimately leading to desiccation of plant tissue.

Following the application of REGLONE, penetration through the leaf surface occurs almost immediately and the physiological action of diquat takes place within a matter of minutes.

Due to the requirement of light for photosynthesis, REGLONE is inactive in darkness. Despite this, the herbicide may continue limited diffusion into neighbouring cells in the absence of light. For this reason, REGLONE often provides a more effective kill when applied at dusk or on cloudy, overcast days, as the cell desiccation reaction is delayed until the compound has moved more evenly throughout the leaf.

REGLONE binds quickly and strongly to soil and organic material and is no longer biologically active once absorbed. The herbicide therefore poses a negligible risk to leaching and is readily degraded by soil microbes to natural products including water, carbon dioxide and ammonia.

Uses

In Western Australia REGLONE is registered for pre-harvest desiccation in Canola, Lupins and certain pulse crops and for pre-harvest general weed control in Winter Cereals. Always refer to the product label for full DIRECTIONS FOR USE†.

Crop	State	Rate	Critical Comments
Canola	All States	1.5 to 3L/ha^	Spray when 70% of the pods are yellow and the seeds are brown/ bluish and pliable. Canola ripens unevenly and is prone to pod shatter and seed loss. Direct harvest 4 to 7 days after spraying.
Winter cereals (Pre-harvest weed control)	All States	1 to 3L/ha^	Spray as soon as the crop is fully mature and ready for harvesting. Under wet spring conditions crops can periodically become infested with weeds which seriously interfere with harvest operations. REGLONE will control these weeds allowing more efficient harvest.
Lupins	All States	2 to 3L/ha^	Spray as soon as the crop has reached full maturity. Helps overcome slow and uneven ripening and weed problems at harvest.
Dry Beans, Dry Peas, Lentils, Chickpeas, Faba Beans	All States	2 to 3L/ha^	Spray as soon as the crop has reached full maturity. Helps overcome slow and uneven ripening and weed problems at harvest.

^Wetting Agent – add AGRAL® at the rate of 200mL/100L or BS1000* at 160mL/100L of prepared spray unless otherwise specified.

†ALWAYS read the REGLONE label for further information before use.

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Canola application timing

Canola ripens unevenly and is prone to pod shatter and seed loss. Canola desiccation should commence when 70% of the pods are yellow and the seeds are brown/bluish in colour and pliable. A more objective timing is to apply when the seed colour at each of the three sections of the stem on most plants is as follows:

Top third: More than half of the seed will be green, firm and pliable with a few early ripening seeds brown to black in colour.

Middle third: 90% of the seed will be reddish brown to dark brown with a few seeds black. The remaining 10% will be green but must be firm and pliable.

Bottom third: All the seed will be dark brown to black.

For canola crops that are leaning, the seeds on the upper side of the stem will mature ahead of those shaded from the sunlight. In this situation, spray when all the seed in the exposed pods have turned reddish brown to dark brown.

Efficacy in reducing seed set of Wild Radish

The timing of application of REGLONE MUST ALWAYS be based upon crop growth stage in order to minimise yield loss from herbicide application. Unfortunately the optimum growth stage timing for weed control is often too early relative to crop development. As such, crop growth stage must always form the basis of herbicide application timing in order to avoid significant yield loss. Despite this, it is often asked what level of seed set reduction of wild radish is likely to be achieved according to different stages of weed growth. Work conducted by Aik Cheam and Siew Lee has shown that in wild radish the seed set will be maximised where herbicide application occurs prior to the formation of an embryo in the seed of wild radish. This period generally lasts for approximately one month from the time of first flower of the weed.

A timeline of radish seed development is presented in Table 1, and highlights the attributes seen during the critical Stage 1 and 2 period.

Application prior to the crop reaching physiological maturity is likely to impact on screenings or yield or both. While it might be tempting to apply REGLONE earlier to increase weed seed set control, this needs to be considered against the likely impact on economic returns in the current season.

Application

As translocation of the active ingredient is extremely limited, spray coverage is critical. Nozzle selection, boom height and water volume should aim to maximise coverage whilst minimising potential for spray drift. High humidity, light dew or light rain (below the point of run-off) may help to spread the product more evenly across the leaf surface, though should not be replied upon alone.

To optimise product efficacy complete coverage is essential, with full penetration into the target foliage necessary. A boomsprayer fitted with flat fan nozzles is preferred to ensure even coverage and minimise drift. The boom should be set at sufficient height above the crop to provide a complete double overlap of the flat spray pattern. Best results will be obtained when application is made in dull weather or at the end of the day. Avoid spraying in high winds or under temperature inversion conditions. Avoid spraying if the Delta value is >10°C.

Boomspray Application: 100 to 200L/ha

Aerial Application

Flying height, pressure, nozzle size and positioning on the aircraft should be such as to minimise spray drift. Avoid spraying in high winds or under thermal (temperature) inversion conditions or flying heights conducive to drift.

Aerial Application: 30 to 60L/ha

Mixing

Add the required quantity of REGLONE to water in the spray tank and agitate to give even mixing. Agitate again if left standing. Use clean water only, as suspended soil particles in dirty water interfere with herbicidal action.

Table 1. Timeline of radish seed development

Development stage	Description of wild radish	Time from first flowering
Stage 1	Early flowering and pod development; newly formed thin pods. Ideal time for blanket wiping, slashing, green or brown manuring but not crop-topping because of crop damage.	The pre-embryo stage lasts about 21 days from the time of first wild radish flower.
Stage 2	Mid-flowering and pod fill; well-formed pods are still squashy and watery when pressed between the finger and thumb. Seed development at ovule stage with no embryo.	
	Critical time	
Stage 3	Embryo formed; pods still squashy and watery but newly-formed embryo already present.	Embryo forms about 21 days after wild radish flowers.
Stage 4	Late flowering and pod development, pods turned woody. Green well-developed embryos present when pods are crushed.	

Source: Cheam and Lee (2006), Proceedings of the Wild Radish and Other Cruciferous Weeds Symposium pp. 44-50

†ALWAYS read the REGLONE label for further information before use.

Adjuvants and wetting agents

REGLONE contains no wetting agent. A non-ionic wetting agent should be added to the spray mixture unless otherwise specified. Add a 100% non-ironic surfactant such as BS1000* at 160mL/100L of prepared spray unless otherwise specified.

The addition of spray oils will generally not improve the activity of REGLONE but may reduce droplet evaporation under warmer temperatures and low humidity.

Rainfast period

Whilst the rainfast period for REGLONE is 30 minutes, the herbicide is biologically rainfast within minutes. In practice, rain has little or no detrimental effect on its activity and only low herbicide rate combined with heavy rainfall can reduce the effectiveness of the product.

Harvest timing

Canola commonly ripens unevenly and is prone to pod shatter and seed loss. Crops may be direct harvested 4 to 7 days after spraying. To ensure a sound, clean sample of seed, the manufacturers' instructions on setting-up the header for harvesting canola should always be followed.

Withholding period

Grazing: DO NOT GRAZE OR CUT SPRAYED VEGETATION OR STOCK FOOD FOR 1 DAY AFTER APPLICATION.

Harvest: Dry beans, Dry peas, Oats, Wheat and Winter cereals: NOT REQUIRED WHEN USED AS DIRECTED

Canola: DO NOT HARVEST FOR 4 DAYS AFTER APPLICATION

Chickpeas, Faba beans, Lentils and Lupins: DO NOT HARVEST FOR 2 DAYS AFTER APPLICATION REGLONE poses a low hazard to bees.

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