

BROOM AGENTS & HERBICIDES

Is it possible to use the two together?

Three control agents are now commonly attacking broom in many parts of the country (see *Broom seed beetle*, *Broom psyllid*, and *Broom twig miner*).

To give them the best possible chance of establishing and working effectively you should avoid exposing them to herbicides. However, there are some situations where this may not be practical:

- When the agents are not yet common or widespread;
- Where conditions prevail that favour broom growth and not the control agents;
- When it is important to kill every plant – a result that is not usually achieved by biological control agents alone;
- Where broom is growing among other weeds that need to be sprayed.

If you must spray, follow the instructions below to minimise damage to broom agents.



When should I spray?

Do not spray when juvenile life stages are predominant (see *Table 1*) as they are not usually mobile and cannot survive if their host plant dies. The only exception is twig miner pupae as they don't require a live host plant to complete their development and the cocoons seem to offer extra protection against the harmful effects of herbicides. If you have all three agents on your broom, then the least harmful time to spray would be in early November when the twig miners are still

Table 1: Safe spraying times for broom agents

Agent	Times when vulnerable juvenile life stages are around	Safest time to spray
Broom psyllid	All year round	Early November
Broom seed beetle	Early October – late January	Early February – late October
Broom twig miner	Early December – early October	Early October – late November



Table 2: The effect of herbicides and surfactants on broom agents

Treatment	Field rate (ml/litre)	Effect after 48 hours		
		Broom seed beetle	Broom psyllid	Broom twig miner
Roundup® (glyphosate)	10	7% dead	87% dead	All alive
Pulse® (polydimethylsiloxane)	2	Not tested	All dead	80% dead
Roundup® + Pulse® (glyphosate + polydimethylsiloxane)	10+2	40% dead	All dead	87% dead
Tordon Brushkiller® (picloram+ triclopyr)	2.5	All alive*	50% dead*	All alive*
Renovate® (triclopyr)	3	All alive	All dead	40% dead
Boost® (dimethicone copolyol)	1	27% dead	All dead	60% dead

* extrapolated from other results

pupating, and adult psyllids and seed beetles are around. Any eggs laid on sprayed plants will be wasted but if the adults are able to find some unsprayed plants nearby, then populations of them should still persist in the area.

Be aware that the agents' life cycles may vary slightly throughout the country and from year to year, depending on climatic conditions.

What herbicides are safe to use?

We have tested the impact of some commonly used herbicides and surfactants (see Table 2):

- Broom psyllids were extremely sensitive and suffered high mortality at the recommended field rates of all the products we tested. Tordon Brushkiller® was the least damaging herbicide but is still likely to kill about half the psyllids. If possible, it would be best not to expose them to any herbicides at all.
- Broom twig miners were moderately sensitive and not seriously affected by field rates of

Roundup® or Tordon Brushkiller®. Other products should be avoided.

- Broom seed beetles were relatively hardy and not seriously affected by field rates of Roundup®, Renovate® or Tordon Brushkiller®.

If you have all three agents present, then the product that would do the least harm overall would be Tordon Brushkiller®.

Surfactants can be more toxic than herbicides themselves and should be avoided at all costs. Surfactants act by reducing the surface tension of herbicide formulations and dissolving plants' waxy protective cuticles. They may act in a similar way on insects making them more prone to dehydration and chilling, and may also interfere with the insect's ability to breathe.

How else can I minimise harmful effects?

Always use the lowest rates and apply the smallest quantities of herbicide possible. Avoid blanket-spraying techniques.

These recommendations are derived from research on the effects of commonly used herbicides and are not intended as an endorsement for any particular brand. The name or findings of Landcare Research may not be used for advertising or promotional purposes.

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