

Semi-selective herbicide use in nursery weed control[©]

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BACKGROUND

Herbicides fall into three practical categories (groups):

- A. Pre-emergent.
- B. Non-selective (knockdowns), semi-selective refers to the use of non-selective knockdowns at ultra-low concentrations to control weeds and to avoid off target damage in bushland and nursery situations.
- C. Selective: selective relates to target species or types of weed control within cereal crops, grass selective, etc.

A considerable body of science in the use of semi-selective herbicide use has been developed by scientists and practitioners in Western Australia to combat particular environmental weeds in quality bushland. The intention has been to find effective weed controls using herbicides without off target damage. This work over many years has led to the development of very successful techniques which may have application to nursery weed control.

This presentation is our introduction of the use of non-selective knockdown herbicides at ultra-low concentrations for nursery weed control.

DISCUSSION

Products

1. Western Australia.

The following are some of the knockdown herbicides that are currently being used in semi-selective mode with Western Australia (WA) bushland; these are permitted for off label uses in WA:

- Metsulphuron (Brush Off[®])
- Triasulphuron (Logran[®])
- Clopyralid (Lontrel[®])
- Halosulphuron (Sempra[®])
- Haloxyfop (Verdict[™])

2. New Zealand.

I could find only one reference to the use of a herbicide in semi-selective mode – Metsulphuron for use in Ohehunga control on golf courses (Massey/University of NZ) .

New Zealand herbicide brand name match:

- Metsulphuron: Associate[®], Agrpro[®], Muturon[®], etc.
- Triasulphuron: Titan, Genfarm
- Clopyralid: Versatill[™]
- Halosulphuron: Enviromax, Nufarm
- Haloxyfop: Hurricane, Ignite

Objective of trials

- Determine if control could be achieved without off target damage.
- Which chemical would provide best overall results and which was best for particular weeds.
- If mortality was not achieved, was it possible to prevent weed seed set.

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MATERIALS AND METHODS

Preparation and application

The following is a guide for nursery application:

- Accurate measurements by weight critical.
- Use clean filtered water.
- Granular herbicides – use warm water to aid dissolution.
- Waiting period for watering will apply.
- Avoid spraying on warm days.
- Mix in 20-L volume and dispense to smaller units.
- Apply to strong plants.
- Apply once, avoid double spray.
- Target weeds as best possible.

Trial outline

- Various application rates and mixtures were trialled on individual plants, including combinations of two herbicides given their compatibility.
- Nine species of Perth natives chosen for weed treatment.
- Settled on the following:
 - o Triasulphuron at rate 1.2 g 20 L⁻¹
 - o Metsulphuron at rate 0.6 g 20 L⁻¹
 - o Combo of triasulphuron and metsulphuron (50/50)

Weeds targeted

Scientific name

Cardamine hirsuta

Chamaesyce spp.

Gnaphalium spp.

Oxalis spp.

Sagina procumbens

Marchantii polymorpha

Bryophyte

Common name

Flick weed

Asthma weed, cats hair

Cudweed

Wood sorrels

Pearlwort

Liverwort

Mosses

RESULTS

Logran results

- Effects in place within 1 to 2 days for cudweed and flick weed.
- Cud weed species were heavily affected; within a week most wilted off.
- Stunted and discolouration of *Oxalis* spp.; weeds left in an inferior state, roots and stems still in place with leaves wilted off.
- Liverworts and sponge-like moss displayed changes by the 2nd week and treatment appeared to be effective.
- No abnormal changes in grass-like moss (pearlwort).
- Successfully achieved aims; no off target impact.

After 1 month.

Weeds

Flick weed

Asthma weed

Cudweed

Wood sorrels

Pearlwort

Liverwort

Moss

Impact

Decayed/rotted off/eradicated

Stunted growth, yellowing of leaves

1 to 2 days; strong signs of wilt, decayed

Stunted growth, yellowing of leaves

No effect, seed set of pearlwort not effected

Eradicated

Stunted growth

Metsulfuron results

- Took 2 to 3 weeks for changes to be observed.
- Successful on flick weed and cud weed species; most wilted, off completely by the end of the month.
- Similar to the effects of Logran on *Oxalis* spp.; roots and stems still in place.
- Successfully achieved aims.

Weed results after 1 month:

Weeds	Impact
Flick weed	Stunted growth, strong signs of wilt
Asthma weed	Stunted growth, signs of rot
Cud weed	Eradicated
Wood sorrels	Stunted growth, yellowing of leaves

Logran and metsulfuron mix results

- Effects take up to 3 to 4 weeks; slow to act compared to other trials.
- Cud weed did not wilt off completely within a month compared to other trials.
- Good against flick weed species; by the end of the month most had wilted off completely.
- Effective against *Oxalis* spp.; able to produce adverse effects on infestations.
- Possibility that Logran and Metsulfuron are working against each other.
- Aims achieved but not best option.

Weed results after 1 month:

Weeds	Impact
Flick weed	Stunted growth, strong signs of wilt
Asthma weed	Stunted growth, yellowing of leaves
Cud weed	Stunted growth
Wood sorrels	Stunted growth, yellowing of leaves
Pearlwort	No effect
Moss	Stunted growth

CONCLUSION

Summary of results

- Earlier stages of trials are positive.
- Trials show that logran and metsulfuron act better on certain weeds.
- Same mode of action, different active constituents; affect different weed species at different rates.
- Ongoing trials: Liverwort regrowth, time it takes for new weed growth after application.
- More trials to be done with different Group B herbicide products.
- Repeat current trials for conclusive evidence.

Potential with caution

- Encouraging results.
- Impacts on succulents/herbs may be adverse.
- May be more relevant to natives and strong ornamentals.
- Suggest small scale trials with very low concentrations, then upscale to achieve weed morbidity and assess off-target impact.

