

Onion weed control in medic pastures – a herbicide evaluation

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RESEARCH

Searching for answers

Location:

Kyancutta
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Rainfall

Av. Annual: 316 mm
Av. GSR: 248 mm
2015 Total: 278 mm
2015 GSR: 253 mm

Yield

Actual: Medic dry matter on 24
August up to 3.2 t/ha

Paddock History

2014: Axe
2013: Medic

Soil Type

Sandy loam

Plot Size

6 m x 1.5 m x 3 reps

Yield Limiting Factors

Nil

Why do the trial?

Onion weed (*Asphodelus fistulosus*) is a significant pest of crops and pastures on many soil types on upper EP. Onion weed that germinates in the pasture phase often results in thick stands of large plants that require repeated herbicide application and/or cultivation to control prior to a crop phase. Cultivation prior to sowing is a widespread practice to control the weed and reduce the residues to manageable levels. However, cultivation can expose the soil to erosion.

Onion weed in pastures regularly sets seed prior to the end of the growing season, ensuring the seed bank is replenished and the weed persists in every phase of the rotation. A key strategy to reduce the impact of onion weed, and the need for cultivation, is to reduce growth and seed set in the pasture phase of the rotation. Non-selective herbicides can control actively growing onion weed plants, but pasture growth is also affected.

Previous trials by the UNFS group, MDB NRM, and PIRSA have shown the following herbicides can provide adequate control of onion weed in non-selective situations:

- Paraquat and double knocks of paraquat
- Glyphosate plus metsulfuron methyl mixtures (+/- paraquat second knock)
- Glyphosate plus LVE ester 2,4-D plus metsulfuron methyl, (+/- paraquat second knock)
- Chlorsulfuron
- Spray Seed
- Alliance

This trial was established to investigate herbicide control of autumn/winter germinating onion

weed in the pasture phase, while maintaining the productivity of the medic pasture. This trial evaluated the herbicide control of young actively growing onion weed in a vigorous medic pasture. The herbicides, with the exception of paraquat, were chosen to minimise the impact on the medic biomass production.

How was it done?

The replicated trial (3 replicates) was established on a sandy loam paddock south of Kyancutta. The paddock was sown to cereal in 2014, and early opening rains encouraged onion weed to emerge in autumn in the following medic phase of the rotation. Medic establishment was also good following the opening rain event. Herbicide treatments were applied to the replicated trial on 29 May 2015 with a tractor mounted 3-point linkage shrouded sprayer (water rate @ 100 L/ha). Most of the onion weed was less than 10 cm high. Onion weed counts were taken from each plot prior to herbicide application and at the end of the trial.

Observations on weed control and effect on the medic growth were recorded 17 days after treatment, 31 days after treatment and 61 days after treatment. Medic dry matter cuts were taken 85 days after treatment.

Weeds

Key messages

- **Onion weed is a significant pest and competitor of medic pastures. In mixed farming systems, control in the pasture phase is often reliant on cultivation.**
- **None of the herbicides evaluated in this trial provided adequate onion weed control in the medic pasture phase without unacceptable reduction in medic biomass.**
- **The use of non-selective herbicides and their mixes, combined with strategic cultivation if required, is still the most effective short term strategy in reducing the impact of onion weed on crop/pasture systems on Eyre Peninsula (EP).**

Table 1 Herbicide treatments applied in 2015 and costs (\$/ha).

Herbicide	Active Ingredient	Application Rate	Chemical Group	Approx \$/ha
Nail 240EC	240 g/L carfentrazone-ethyl	50 ml/ha	G	8.20
Ecopar	20 g/L pyraflufen-ethyl	600 ml/ha plus BS1000	G	25.05
Ecopar plus MCPA Agritone 750	20 g/L pyraflufen-ethyl	400 ml/ha	G	19.17
	750 g/L MCPA	330 ml/ha	I	
Brodal Options	500 g/L diflufenican	150 ml/ha	F	6.60
Bromicide 200	200 g/L bromoxynil	1.4 L/ha	C	26.60
Agtryne MA	275 g/L terbutryn	500 ml/ha	C	6.75
	150 g/L MCPA		I	
Buttress	500 g/L 2,4-DB	2 L/ha	I	38.00
Buttress	500 g/L 2,4-DB	3 L/ha	I	57.00
Raptor WG	700 g/kg imazamox	45 g/ha plus BS1000	B	37.20
Kyte 700 WG	700 g/kg imazethapyr	70 g/ha plus BS1000	B	8.20
BroadSword	800 g/kg flumetsulam	25 g/ha plus BS1000	B	13.13
Gramoxone	250 g/L paraquat	600 ml/ha	L	3.36

What happened?

Most herbicide treatments caused some early visual effect on the onion weed, but physical symptoms had diminished by the time of the third assessment, 61 days after treatment. The Gramoxone treatment was the only herbicide that resulted in commercially adequate control of onion weed for the whole season. Even though a “relatively low” herbicide rate was applied, the

level of onion weed control was high at 95% (Figure 1).

Bromicide 200, Buttress (2 L/ha), BroadSword and Kyte all provided better weed control than the control (Figure 1), but levels of control were below that considered commercially acceptable (range of 25-38% control). None of the other treatments performed statistically better than the control.

Early medic growth was reduced, especially where Gramoxone, Ecopar + MCPA, Bromicide, Agtryne MA and Nail were applied, but the visual effect reduced as the season progressed. Dry matter cuts (taken mid flowering/early podding) showed that the Gramoxone treatment significantly reduced medic biomass by 46% of the control (Figure 2), and was the only treatment that was significantly different from the control ($P < 0.003$).

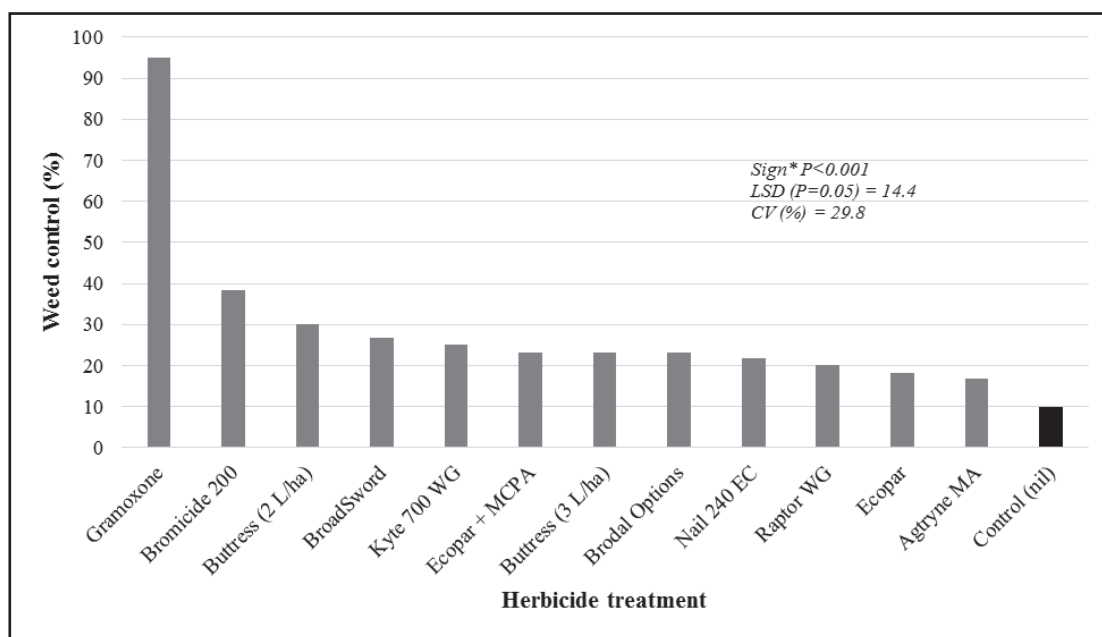


Figure 1 Weed control (%) at Kyancutta in 2015.

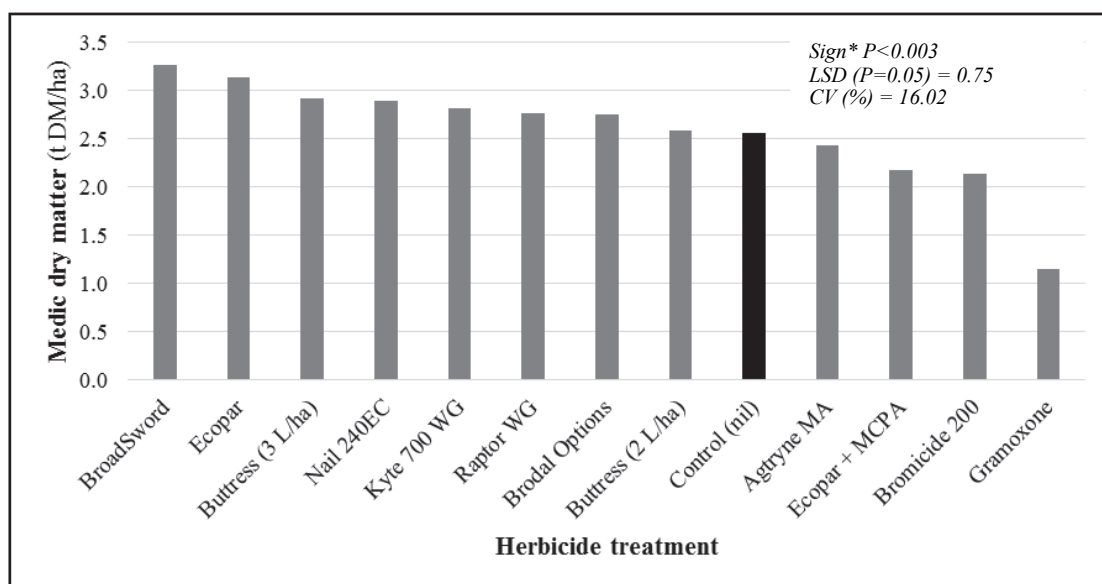


Figure 2 Medic dry matter (tDM/ha) following herbicide treatments in 2015.

What does this mean?

Gramoxone provided the best season-long onion weed control (95%), but also had the largest impact on medic biomass. The use of Gramoxone to control onion weed after the break of the season is risky as pasture quantity, and groundcover levels can be reduced and erosion risk increased on sandy soils. No other herbicide tested provided acceptable control of young actively growing onion weed.

By the end of the growing season, the Gramoxone treatment was the only herbicide that had a significant impact on medic biomass production when compared with the nil treatment. Some other treatments had an early impact on medic health and growth, but biomass had largely recovered by the time of final biomass cuts.

The selective control or suppression of onion weed in medic pasture appears difficult to obtain with the herbicides used in this trial. At this stage, the strategy of non-selective herbicide application after the medic has set seed, again if required in summer, and in autumn prior to sowing, appears to be the practice that helps minimise some seed set, preserve ground cover in the pasture phase of the rotation, and minimise erosion risk.

Further investigations into alternative herbicide application techniques are planned to minimise the role of cultivation in onion weed control.

Acknowledgements

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Registered products: see chemical trademark list.