

BROADLEAF WEED CONTROL IN EMERGING SUBTERRANEAN CLOVER

One way to achieve a high sub clover content pasture is to establish a pure sward and then allow it to set seed. Grass (e.g. cocksfoot) can be overdrilled the following autumn. However, sub clover is susceptible to being shaded by fast growing broadleaf weeds at establishment.

ALS INHIBITING HERBICIDES

Previous research at Lincoln University found ALS inhibiting herbicides provided effective broadleaf weed control when applied at the 4-6 trifoliolate leaf stages. These herbicides inhibit the ALS (acetolactate synthase) enzyme which is part of the pathway for producing amino acids that form proteins. Weed growth is reduced shortly after application because cell division stops. This is followed by wilting in the young leaves. Plant death occurs between 10 days and two months after application depending on environmental conditions. ALS inhibiting herbicides have a low mammalian toxicity because they do not have ALS enzymes.

Spinnaker® (a.i. imazethapyr) and Headstart® (a.i. flumetsulam) are two ALS inhibiting herbicides available in New Zealand. Both herbicides were applied at the recommended rates for clover.

SUB CLOVER YIELD RESPONSE

No sub clover seedling death occurred when herbicides were applied at the 4+ trifoliolate leaf stage in July. Both Spinnaker® and Headstart® reduced the broadleaf weed yield by 1000 kg DM/ha (Figure 1). Reduced competition and shading increased sub clover yield by 1300 kg DM/ha compared with the untreated control.

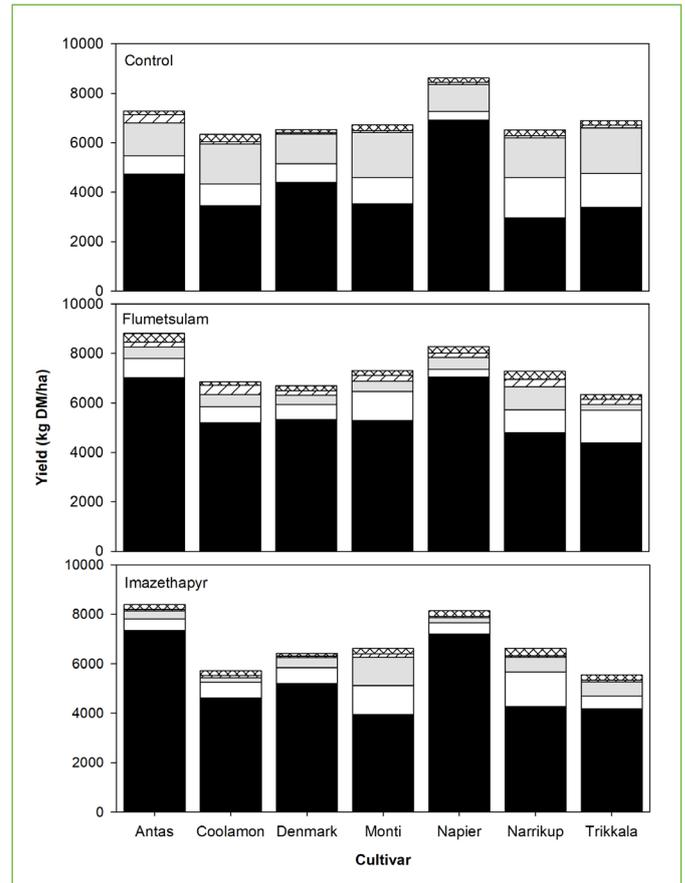
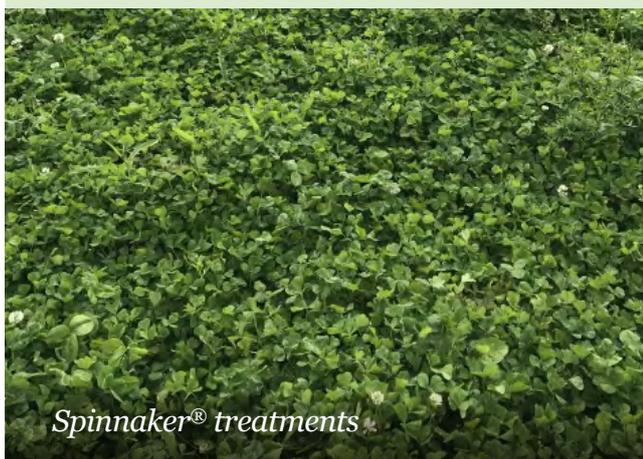


Figure 1. Yield of subterranean clover (■), white clover (□), broadleaf weed (■), grass weed (▨) and dead matter (▩) from May to December 2018, in seven sub clover monocultures after herbicide application, at Lincoln University, Canterbury.

All seven sub cultivars evaluated were tolerant to both Spinnaker® and Headstart®. However, larger leaved cultivars, such as 'Antas' and 'Napier', showed a greater yield response after broadleaf weeds died. They took advantage of the extra space in the pasture and produced more clover DM than the other cultivars. The herbicides also had no effect on sub clover regeneration the following autumn.



Weed presence in the Control (top) and Spinnaker® treatments (bottom) five months after herbicide application with some resident white clover present.

PHYTOTOXIC RESPONSE

Yellowing or reddening of sub clover leaves was seen shortly after application with ALS inhibiting herbicides. However, when herbicides were applied at the 4+ trifoliate leaf stage this phytotoxic response was temporary and did not affect yield over the season.

RESIDUAL EFFECT

Spinnaker® had a longer soil residual than Headstart®. Eight months after application ground cover from docks was halved in the Spinnaker® treatments compared with the control. Headstart® had no effect on the docks at this stage. Monocultures of sub clover re-established the following autumn with up to 2000 seedlings/m² germinating.

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Phytotoxicity symptoms of sub clover 36 days after application of Spinnaker® and Headstart®.

REFERENCES

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FURTHER INFORMATION

For further information please contact Prof Derrick Moot (Derrick.Moot@lincoln.ac.nz).

ACKNOWLEDGEMENTS

Beef + Lamb New Zealand would like to thank and acknowledge Professor Derrick Moot, Breanna Taylor and the Lincoln University Dryland Pastures research Team for their assistance with this fact sheet.

Funding for the "Hill Country Futures" research programme (BLNZT1701) was provided by Beef + Lamb New Zealand, MBE, Seed Force New Zealand and PGG Wrightson Seeds. T.R. Lewis and B.J.O. Taylor acknowledge Masters funding from Mr Roland Stead.