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Caucasian clover responses to fertiliser, lime and rhizobia inoculation at Lake Heron Station, Canterbury

Alistair Black, Alan Harvey, Jim Moir, Derrick Moot

New Zealand's specialist land-based university

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Note:

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Caucasian clover

Lake Heron Station

1. Yield of a mature stand of Cc and its response to superphosphate and lime
2. Use of nitrogen fertiliser to improve establishment of a new stand of Cc

★ Mature stand of Cc

★ New stand of Cc

Mature stand of Cc

680 m a.s.l.

Sown 2002

No fertiliser since sowing

pH 5.5, Olsen P 5

Super: 0, 100, 200 & 400 kg/ha
Lime: 0 and 5 t/ha of lime
Four replicates, 12 x 20 m plots

Imagery ©2012 Cnes/Spot Image, DigitalGlobe,

**DM yield in spring, summer and autumn
2012/13 and 2013/14**

Caucasian clover yield

9 months (Nov 2012)

23 months (Nov 2013)

Nov 2012

Control

**400 kg/ha super
5 t/ha lime**

**Olsen P 11
pH 5.5**

**Olsen P 14
pH 6.0**

Nov 2013

Summer 2014

Autumn 2014

**Aboveground shoots
1620/m²**

Biomass 5.1 t DM/ha
Taproots 9/m²

New stand of Cc

765 m a.s.l.

‘Native’

pH 5.5, Olsen P 7

1) 110 kg/ha super (nil N)

2) 100 kg/ha Cropmaster 20 (20 kg N/ha)

Super

Plot 1

Super

Plot 2

Crop20

Plot 3

Crop20

Plot 4

Super

Plot 5

Super

Plot 6

Crop20

Cc plants 11 weeks after sowing (Mar 2012)

	Starter N (kg/ha)		P value
	0	20	
Plants/m ²	45	43	NS
Shoot dry weight (mg)	6	17	<0.01
Nodulation†	1.0	1.2	<0.05
†1 = no nodules, 5 = abundant nodules			

11 weeks (Mar 2012)

11 weeks (Mar 2012)

A photograph of a grassy field with mountains in the background. The field is covered with patches of green and brown grass. In the background, there are large, dark mountains under a blue sky with some clouds. A fence line is visible in the distance on the right side.

11 months (Nov 2012)

20 kg N/ha

Rhizobia effectiveness

Inoculated seed

-SP   **+SP**
No lime

-SP   **+SP**
Lime

Bare seed

-SP

+SP

No lime

-SP

+SP

Lime

Conclusions

1. Mature stand

- Persisted for 10 years without fertiliser since sowing
- 2400 and 1000 kg DM/ha of clover per year at this site
- Cc yield requires P and S as for other clovers

2. New stand

- Cc must be freshly inoculated with specific rhizobia
- Poor inoculation was not overcome by N fertiliser