



University of Kentucky  
UKnowledge

---

International Grassland Congress Proceedings

21st International Grassland Congress / 8th  
International Rangeland Congress

---

## Caucasian Clover (*Trifolium ambiguum*) Is Persistent in New Zealand Montane, Improved Rangeland But Requires Regular Sulphur Application for Productivity

P. Jarvis

*Lincoln University, New Zealand*

R. J. Lucas

*Lincoln University, New Zealand*

J. R. Sedcole

*Lincoln University, New Zealand*

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/2-1/15>

The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

---

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).

## Caucasian clover (*Trifolium ambiguum*) is persistent in New Zealand montane , improved rangeland but requires regular sulphur application for productivity

P. Jarvis , R .J . Lucas and J .R . Sedcole . Lincoln University , Agriculture and Life Sciences Division , PO Box 84 , Lincoln University , New Zealand . E-mail : sue-peter .jarvis@xtra.co.nz

**Key words :** Caucasian clover , Kura clover , *Trifolium ambiguum* , persistence , sulphur

**Introduction** Caucasian clover (Cc) became dominant after 10 years in a 25 species , grazed pasture under higher rates of phosphorus (P) and sulphur (S) . At low P and S inputs , Cc persisted but was unproductive on the low fertility tussock grassland site (Scott , 1998) . This paper records the outstanding persistence and productivity of Cc when S and P were applied regularly to two rangeland sites in the upper Rangitata valley (Lat 43°S , Long 171°E) .

**Methods** Jarvis *et al.* (1998) reported responses of hexaploid Monaro Cc to S fertiliser for an experiment which was established (500m asl , 940 mm rainfall) in spring 1992 . P at 5 rates and S at 4 rates were applied in 1998 and again in 2001 . Plots were cut in December each year to obtain spring/early summer herbage accumulation and botanical composition . A similar experiment was established on a higher terrace (700m asl , 1000mm rainfall) in 1975 (Lucas *et al.* , 1981) . This site has been top-dressed at 2-3 year intervals at 200kg/ha sulphur superphosphate (8% P , 20% S) for the last 20 years .

**Results and discussion** Figure 1 shows the large DM response of Cc to S and P in 2002 after treatments were reapplied in 2001 . Three years later the responses to P were less marked especially at low S (Figure 2) . The mean 2005 yields were less than those of 2002 . Craighead and Metherell (2006) also indicated that S applications are required more regularly than P . In the 1975 experiment , Cc has persisted in the sward for more than 32 years and is still a significant contributor to the pasture under intensive continuous grazing by red deer . The grass component was dominated by *Agrostis capillaris* and *Anthoxanthum odoratum* at both sites . The 15% cover of the prostrate invasive *Hieracium pilosella* present at the start of each experiment was suppressed after 3 years by the application of P and S fertiliser and Cc seed .

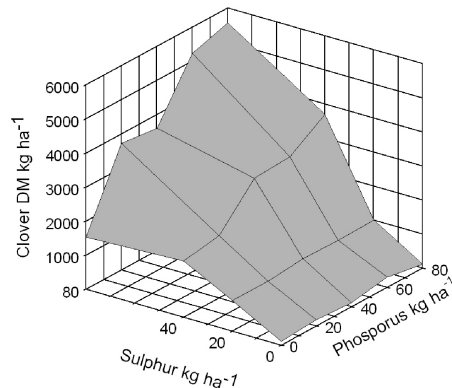


Figure 1 Cc DM (kg/ha) 2002 .

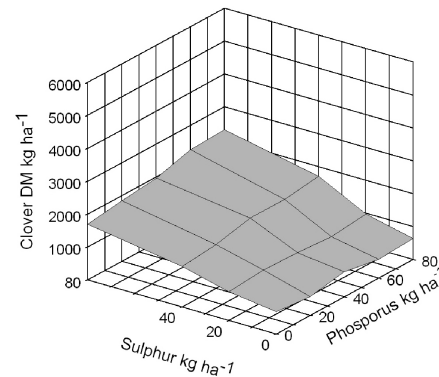


Figure 2 Cc DM (kg/ha) 2005 .

**Conclusions** Caucasian clover is well adapted to the montane rangeland regions of New Zealand . Persistence is currently demonstrated at sites at 700 and 550m a .s .l . where Cc was sown in spring 1975 and 1992 . Sulphur applications are required every 2-3 years to maintain productivity at these inland sites

### References

- Allan , B .E . , Keoghan , J .M . 1994 . More persistent legumes and grasses for oversown tussock country . *Proceedings of the New Zealand Grassland Association* 60 , 143-147 .
- Craighead , M .D . , Metherell , A .K . 2006 . The impact of the form and frequency of sulphur on pasture yield and composition in South Island high country . *Proceedings of the New Zealand Grassland Association* 68 , 361-367 .
- Jarvis , P . , Lucas , R .J . , Sedcole , J .R . , White , J .G .H . 1998 . Responses of Caucasian clover to sulphur fertiliser . *Proceedings of the New Zealand Grassland Association* 60 , 193-197 .
- Lucas , R .J . , White , J .G .H . , Daly , G .T . , Jarvis , P . , Meijer , G . 1981 . Lotus , white clover and Caucasian clover oversowing , Mesopotamia Station , South Canterbury . *Proceedings of the New Zealand Grassland Association* 42 , 142-151 .
- Scott , D . 1998 . Sixteen years of Caucasian clover under contrasting managements . *Proceedings of the New Zealand Grassland Association* 60 , 115-118 .