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A. T. Simmons
Charles Sturt University, Australia

Warwick B. Badgery
Department of Primary Industries, Australia

David R. Kemp
Charles Sturt University, Australia

David W. Michalk
Department of Primary Industries, Australia

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Competition in serrated tussock invaded Australian native pasture

A T Simmons¹, W B Badgery², D R Kemp¹ and D W Michalk²

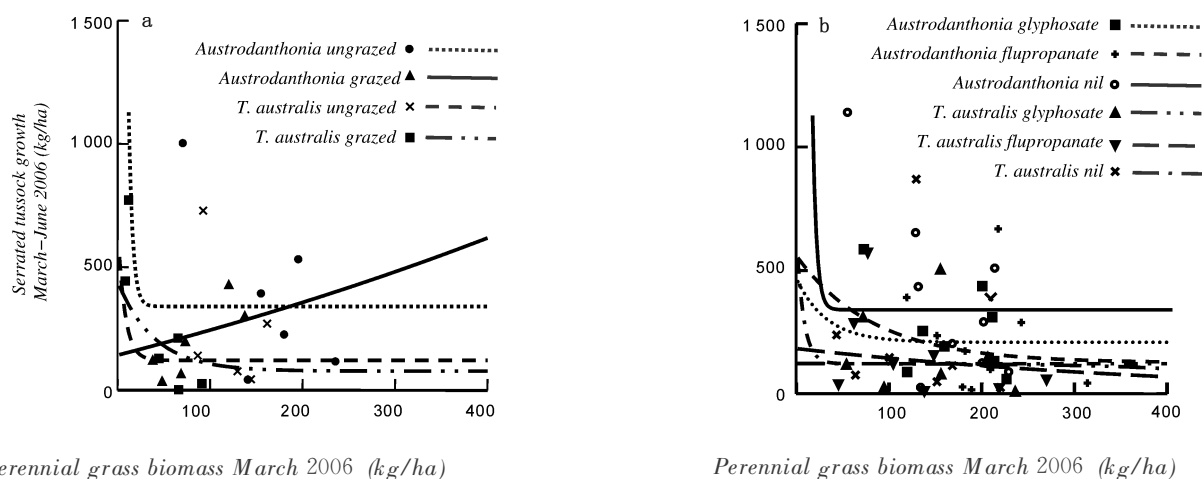
¹ School of Rural Management, Charles Sturt University, PO Box 883 Orange NSW 2800 Australia, Email : asimmons@csu.edu.au ² Orange Agricultural Institute, NSW Department of Primary Industries, Forest Rd, Orange NSW 2800 Australia

Key words : *Nassella trichotoma*, grazing, *Themeda australis*, *Austrodanthonia* spp.

Introduction Serrated tussock (C3, *Nassella trichotoma*) is a weed of national significance that invades native grasslands (> 600 mm rainfall) in south-eastern Australia. Native grasslands are generally found in inaccessible areas where soils are poorer, that makes conventional control methods difficult to implement and economically risky. Increasing competition from existing native grasses provides a more cost effective means to control this weed.

Materials and methods The experiment was located at Trunkey Creek on the Central Tablelands of New South Wales, Australia in both C4 *Themeda australis* and C3 *Austrodanthonia* spp. dominated grasslands. Treatments were a factorial combination of herbicide (nil, spot-spray flupropanate, broad-spray tactical glyphosate) and grazing (constantly grazed, ungrazed). Dry weight rank procedures were used to estimate species composition and biomass for three 0.81 m² quadrats in each plot (10 x 15m) in March 2006 and again in June 2006. Serrated tussock growth (June-March biomass) was plotted against the March 2006 biomass data for native perennial grasses. Lines of best were plotted to examine trends in competition between native grasses and serrated tussock growth for each treatment.

Figure 1 Relationship between serrated tussock growth and perennial grass biomass for *T. australis* and *Austrodanthonia* spp. dominated grasslands for a) no herbicides and, ungrazed or constantly grazed and b) ungrazed and, nil, flupropanate or glyphosate herbicide. Fitted lines indicate trends.



Results and discussion Although lines of best fit did not differ significantly, clear negative trends between native perennial grass biomass and serrated tussock growth are evident. This is the first report to demonstrate that small amounts of native grasses, under dry autumn conditions (a critical time of the year for grass regeneration) can be competitive against adult serrated tussock plants. Serrated tussock growth can be reduced by both species composition and grazing (Figure 1a). In *Austrodanthonia* grasslands that were grazed or ungrazed *T. australis* grasslands, between 30 and 200 kg/ha of perennial grass biomass at the start of autumn, was sufficient to slow serrated tussock growth. *T. australis* grasslands appear more competitive as serrated tussock growth was less in those cases. In grazed *Austrodanthonia* grasslands, there was no competitive effect from this native perennial grass species. Herbicides in *Austrodanthonia* grasslands did dramatically increase the competitive ability of these native perennial grasses (Figure 1b) whereas their use in *T. australis* produced little competitive benefit. Flupropanate is supposed to have less of an effect on C4 grasses than on C3 species, but that was not evident in this case.

Conclusions The differences in competition between pastures types and likely effects due to herbicides and grazing suggest that these three variables (*i.e.* pasture composition, herbicide use and grazing) need to be considered when developing an integrated weed management plan for the control of serrated tussock in Australian native pastures.