

Recruitment and survival of *Nassella trichotoma* (Nees) Hack. (serrated tussock) on the Northern Tablelands of New South Wales

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Summary *Nassella trichotoma* (Nees) Hack. (serrated tussock) costs the Australian grazing industry between \$40 and \$50 million each year through loss of livestock production and costs of control. *N. trichotoma* research has focused on heavily infested areas on the Southern Tablelands of New South Wales where the rainfall is winter dominant. However, little is known of the behaviour of the scattered lower density infestations currently present on the Northern Tablelands of New South Wales where the climate is temperate and the rainfall is summer dominant. This study describes the differences between the ecology of *N. trichotoma* on the Northern Tablelands and that on the Southern Tablelands of NSW, and other Mediterranean environments around the world. This work is part of a larger Ph.D. study on the ecology, detectability and eradication of *N. trichotoma* on the Northern Tablelands.

The aim of this experimental work was to investigate the recruitment and survival of *N. trichotoma* seedlings including an examination of the factors that determine the time of emergence, the duration to reproductive maturity and the survival of plants under varying pasture conditions.

Two sites were selected where seedlings were prominent. Four treatments were used to simulate different levels of pasture competition. These four treatments were vegetated undisturbed pasture, a pasture maintained at 3 cm height by clipping, a sprayed area (glyphosate) that was kept bare, and a grazed pasture. The location, height and basal diameter of already present and emerging seedlings were recorded within each of the treatments. The emergence and survival of the seedlings were measured over time.

The initial results from this experiment indicate that the recruitment of *N. trichotoma* seedlings is influenced by varying levels of pasture competition.

In addition, seasonal effects on the seedlings were obvious with little emergence occurring during the winter months.

All of the treatments had a high number of seedlings present initially. The behaviour and persistence of the seedlings varied under the different treatments imposed.

In the vegetated (ungrazed) undisturbed pasture treatment the number of seedlings initially present declined by approximately half in the first year. There was a low level of new emergence in this treatment, although all new seedlings which emerged survived. It is likely that the competition from the pasture in this treatment is responsible for the low level of new emergence.

In the pasture treatment that was clipped to 3 cm, most seedlings survived for one year. There was also a low level of new emergence in this treatment.

The sprayed area which was kept bare of any pasture was also cleared of the seedlings that were initially present at the start of the experiment. The new emergence in the sprayed plots was relatively high but due to the spraying and the susceptibility of the seedlings at an immature stage none of the new seedlings which emerged in the year survived.

In the grazed treatment approximately half of the seedlings present at the beginning of the experiment persisted over the first year. The grazed treatment also had the highest number of new seedlings emerge and persist during the year. This may suggest that competition from beneficial pasture species is reduced through grazing and therefore allows the seedlings to emerge and survive at a higher rate.

A better understanding of the ecological behaviour of *N. trichotoma* on the Northern Tablelands will allow better management and control programs to be developed.