

# ***Nassella tussock (Nassella trichotoma) management in Canterbury***

**Laurence Smith**

Principal Advisor – Biosecurity

Environment Canterbury

Well over 100 years ago, more than likely in the latter part of the 1800s, an introduced tussock grass started to invade the dry eastern hill country of the South Island, New Zealand. Far away from its native range in South America, *Nassella tussock* embarked on a journey of spread.

*Nassella tussock* seeds were spread by wind uplifting their long panicles, being carried for sometimes long distances on warm early summer eddies, and by human activities such as the movements of people, animals, crops, vehicles, and machinery. So began its unnoticed rise as a plant that would one day have significant impacts on a generation of farmers.

*Nassella tussock* was first identified in the Waipara river in 1905. It spread rapidly to the point in the late 1930s when it was recognised as a problematic weed to agriculture.

A letter dated 12 December 1938 from the Department of Agriculture to Mr Newton Maxwell, who had earlier dropped a sample of a tussock grass at the Department's office, advised the tussock grass had been identified as *Nassella trichotoma* and stated, "It has no qualities that would recommend it to the farmer". This was hardly a call to action, as *Nassella tussock* is not palatable to stock, but it was invasive and was spreading rapidly.

*Nassella tussock* became so dense, estimated at >30,000 plants per hectare in some areas, that it became a monoculture displacing all other pasture species. More than 330,000 hectares were thought to be infested across Canterbury.

By the 1940s the costs of control were beyond many individual farmers and *Nassella tussock* was considered a national threat to agriculture. In 1946 the *Nassella Tussock Act* was passed, and the North Canterbury *Nassella Tussock Board* was formed. From 1946 until 1989 central government funded much of the control work with a cost from 1966 to 1988 estimated at \$NZ 40 million (1991 dollars) (Bourdôt et al. 1992). This equates to \$NZ 72 million in 2021.

Legislation also spawned a regulatory regime to ensure those land occupiers who exacerbated the problem fell into line with the rest of the community.

Many of the farm tracks were developed and maintained in North Canterbury's steep hard hill country, funded by government subsidies at a substantial cost, to ensure easier access for *Nassella tussock* control.

Minutes of the very first meeting of the Board record discussions about how to deal with "non-compliance", the issuing of "Notices" and "enforcement" actions. This hasn't changed through several legislative changes (*Weeds Act 1950*; *Noxious Plants Act 1978*; *Biosecurity Act 1993*) over the past 70 years.

The combination of government-subsidised control and regulation was instrumental in bringing *Nassella tussock* under control.

A transition from board control occurred between the mid-1970s, when government subsidies were paid to people to control their own *Nassella tussock*, until 1989 when, because of local government reform, subsidies being ceased, and the cost of the Board's work falling on ratepayers, the community decided to move completely to land occupier control. Since 1989 land occupiers have been solely responsible for controlling *Nassella tussock*. Environment Canterbury's primary role is to ensure all land occupiers carry out an annual programme to prevent *Nassella tussock* from seeding. By the late 1990s, a population trend monitoring programme was developed and continues today.

Today there are approximately 500,000 ha spread over >1,450 properties where *Nassella tussock* occurs, or has occurred, in Canterbury. The potential distribution of *Nassella tussock* is estimated at 2.1 million ha in Canterbury. In the Hurunui District, where almost 900 properties are affected, the overall population of *Nassella tussock* reduced slightly since 1997 when population trends were first measured at 40 plants/ha,

down to an equilibrium of an estimated 12 plants/ha (on average), which has remained static over the last few years.

The trend monitoring data should be taken on average. Most properties in Canterbury have very low densities of *Nassella tussock* today. Data from 2018-19 estimated the density of plants remaining after annual control efforts on 746 land occupier control properties in the Hurunui District at 11.8 plants/ha.

This equates to 3.7 million plants in the Hurunui District after control and sample inspections. 92.6% of plants are estimated to have seeded, producing an estimated +/- 8.5 billion seeds. Of the 890 properties in the Hurunui District, 152 medium to high density properties produced the bulk of the seed, an estimated +/- 7.3 billion seeds with close to 100% seeding on the highest density properties.

Environment Canterbury may perform the role of an independent regulator, but there has always been an emphasis on education, science and research, and community participation. This has at times been lost, as the focus of the community has often been on the regulatory aspects needed to bring a few people into line with the many people who continue to keep *Nassella tussock* at a sustainable population.

AgResearch scientists Graeme Bourdôt and Shona Lamoureaux have been at the forefront of science and research on *Nassella tussock* for more than two decades, working closely with Environment Canterbury and land occupiers to understand the species and provide the best possible advice on its management.

Environment Canterbury's approach to implementing the Canterbury Regional Pest Management Plan on behalf of the community has been periodically tested to ensure alignment with most people. Four customer surveys have been conducted over the past 15 years. Overall, there has been strong community support (>90 of respondents) for how Environment Canterbury goes about its business. However, there is always room for improvement.

### **Co-designing a new approach for *Nassella tussock***

This year, Environment Canterbury conducted workshops with members of the community, with the goal of co-designing a new approach to *Nassella tussock*. Three workshops were held in Amberley on a fortnightly basis, under the guidance of an external facilitator. Each workshop had a different focus – “Listen”, “Create” and “Refine”. Ten people from the community participated (out of an original 30 interested participants).

Information from these workshops was then collated and shared with the wider community via a “have your say” website. People whose properties have *Nassella tussock* but who were not involved in the workshops were able to ask questions online, answer surveys and start discussions on the information generated at the workshops, feeding back into the approach for the next workshop.

One of the key messages to come from the workshop participants was they would like land occupiers to feel they have greater flexibility about completing work early in the autumn and winter months. Then on completion of their work, have inspections soon after the completion of control work without any potential repercussions of being asked to remove seeding plants later in November – December.

Participants also indicated they would like to see smarter language used by Biosecurity staff during communications. They would also like to see more options for resolving any issues when work to remove plants is required, especially where land occupiers are cooperative and have completed their control work early in the season.

Participants would also like a key contact for discussing pest management issues so they can build a working relationship and understanding for their particular property or situation.

Environment Canterbury was also asked to consider inspecting for more than one pest per property visit.

As a result of the co-design workshops, Environment Canterbury is undertaking the following in the 2021 season:

- More emphasis on early inspections – advertising that this is available and contacting land occupiers earlier in the year to see if they would like to take this option. There is greater opportunity to advise on areas requiring further work or time to remedy problems, without going down the regulatory track towards enforcement to prevent seeding in November.

- Improving Biosecurity officer language when engaging with land occupiers so that it is less on regulation and more on advisory, including listening to any issues that have arisen in the pursuit of thorough and effective control.
- Provide land occupiers with a single point of contact within Biosecurity whom they can contact to discuss any Nassella tussock-related issues and build a relationship. It may not be the same officer visiting every time but there will now be a senior person to fall back on should the land occupier want to discuss any issues.
- Improve educational materials, communication, and engagement with the community. Using previous science-based outcomes and the results of any future research and community discussions to improve Nassella tussock management and enable a collaborative approach to the desired outcome of sustained containment.
- Wherever possible Biosecurity officers will check progress with land occupier control for more than one pest per property visit.

Overall, the co-design workshops provided an excellent opportunity to listen to community concerns and to bring about some change to how Environment Canterbury interacts with land occupiers in relation to pest management.

With improved communication between Environment Canterbury and the community, combined with thorough and systematic control by land occupiers, we should be in a good position to prevent most Nassella tussock plants seeding, preventing spread, and at least holding the overall population to current densities (Fig. 1).



**Figure 1.** Biosecurity officers doing some grubbing and getting some pre-season training near Waipara to ensure they can consistently recognise Nassella tussock, especially the smaller plants earlier in the season (autumn). (Photo: ECan photo library)

## Reference

Bourdôt GW, Hurrell GA, Saville DJ. 1992. Eradication of nassella tussock (*Nassella trichotoma*), an unlikely outcome of grubbing. *New Zealand Journal of Agricultural Research* 35: 245–252.