final report

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Technology adoption of tall fescue pastures by beef and lamb producers

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ABSTRACT

This on-farm pasture species demonstration and comparison project was completed in June 1999. It has contributed to the adoption of new tall fescue cultivars at the expense of older ones, and to a change to management practices used by farmers.

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1. Background

This was an on-farm pasture species demonstration and comparison project aimed at increasing the amount of tall fescue pasture sown and utilised successfully. It was also intended to test the performance of tall fescue in marginal environments under good management. The project also tried to improve the knowledge of users on best management practices for the species.

In 1994 there were several new cultivars that had been bred to overcome some of the limitations identified for tall fescue. This project aimed to demonstrate these to farmers, and encourage their use through comparisons conducted on farms.

2. Objectives

1. Identify suitable districts and 28 farms for the project, for Northern NSW and Southern Queensland by 20 December 1994, and for Victoria and South Australia by 1 September 1995.

2. Successfully establish tall fescue on 28 beef or lamb farms, 12 in Northern NSW and Queensland by 30 June 1996, and 16 in other regions by 30 June 1996.

3. Develop a management booklet for tall fescue use to assist in operational decision making, that is used by 50% of project co-learners and at least 50 other producers by 30 June 1998.

4. By 30 June 1999, to measure an average of 20% more liveweight gain per hectare on pastures based on improved tall fescue cultivars compared with standard district pastures, on sites where animal production has been recorded.

5. By 30 June 1999 to measure;

   (a) a 30% increase in the use of tall fescue cultivars other than Demeter; and
   (b) 20% of farmers who have had contact with the project and are using tall fescue and 10% of other farmers randomly surveyed have adopted at least one management practice promoted by the project.

3. History of activities

Target regions were identified in 1994 and 1995 following meetings and discussions with NSW Department of Agriculture staff, Agriculture Victoria (now DNRE) staff, local agronomists and scientists. The regions selected could be divided into two categories:

1) Regions where the climate and soils were recognised as suiting tall fescue, and the species was already used in some way.
2) Regions where tall fescue was not recommended for use because of past failures, or it had not been tested.

Site supervisors and sites were selected in 1994 for the northern NSW and Queensland regions (Figure 1). Plans were made for sowing and seven were sown in autumn 1995, but five sites were not sown until 1996 due to the widespread and severe drought.

Site supervisors and sites were selected in 1995 for the southern NSW and Victoria regions (Figures 2 & 3). 15 of these were sown as planned in autumn/winter 1996, with one being deferred till 1997.

Supervisors were experienced local agronomists, who were trained by the Fescue for Meat project team in the requirements of pasture management, farmer liaison, record keeping, and liveweight gain measurement.

The Fescue for Meat project team (Gavin Milne, Frank Johnson, Heidi Eisenhauer, and Greg Lough) visited the sites regularly to record progress, advise the farmer on management, and update instructions to the supervisor.

Nine co-learner groups were set up in 1997, and operated with learning activities on sites. These were reduced to four in 1998 by a MLA revision of the contract.

A “Fescue User’s Guide” was written, with 2000 booklets published and distributed, in addition to 5000 summary leaflets. These were well received by farmers and agronomists.

A communication system was developed, and included a newsletter to a mailing list of over 250 people, press releases, and reports in Pacific Seeds newsletters. Papers were presented at the Grassland Society of Victoria and NSW Grassland Society conferences in 1998.

A professional survey was conducted in 1997 to establish a starting point for evaluation of the project. This was to be repeated in 1999 to establish the impact of the project, but was cancelled by a MLA revision of the contract.

Seven sites were sown in regions where Demeter tall fescue was commonly used (northern and central NSW Tablelands), and 21 in regions where tall fescue was not commonly used.

Pastures were established using local methods and managed under the guidance of agronomists and the project management team.

Figure 1. Site locations ( ) – northern NSW.

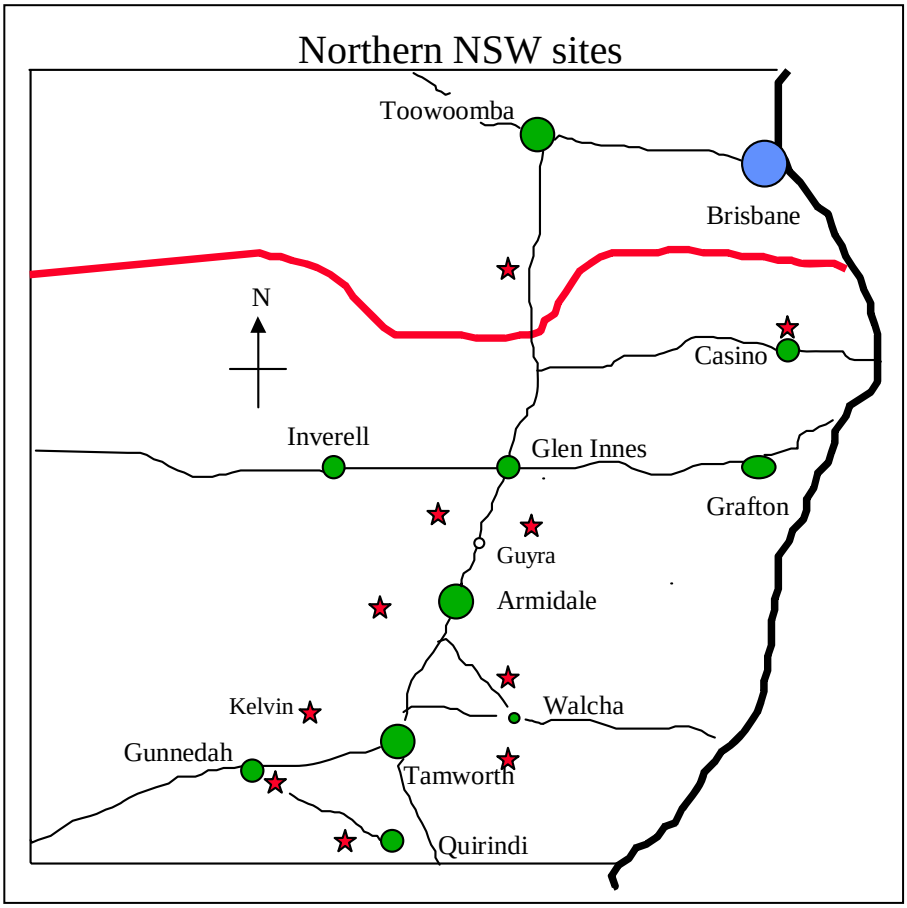


Figure 2. Site locations ( ) – Southern NSW.

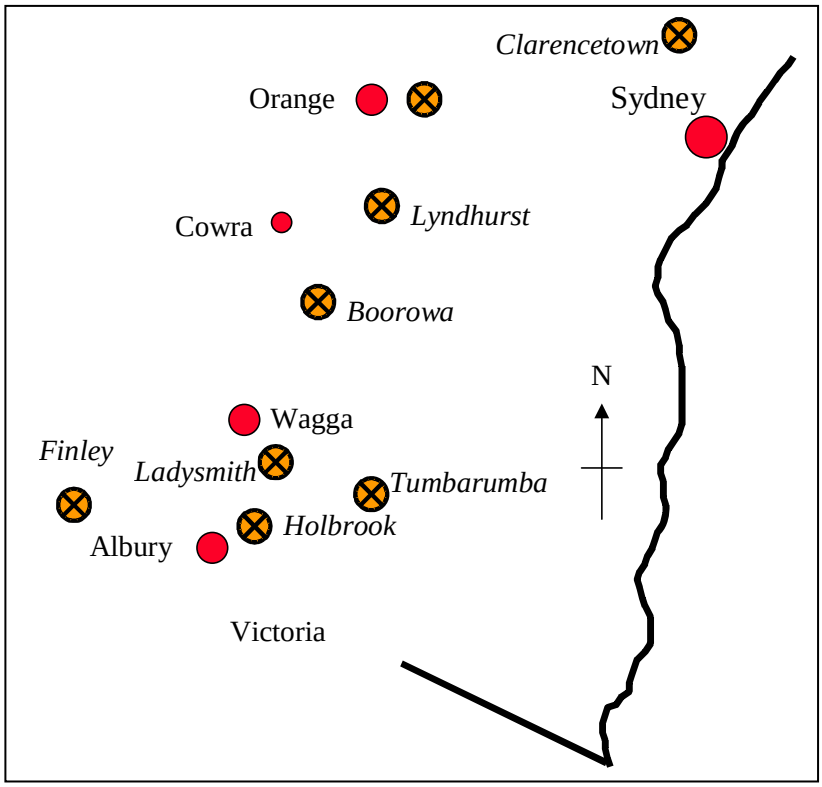
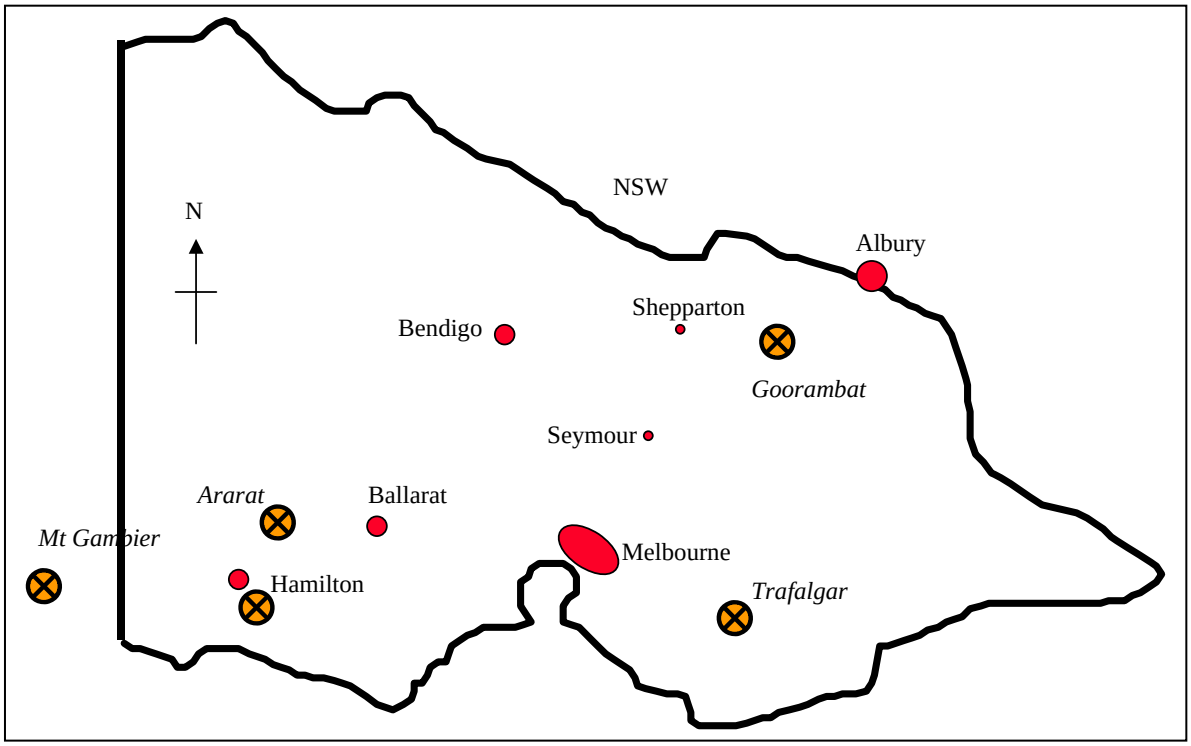


Figure 3. Site locations ( ) – Victoria/South Australia.



4. Results from comparisons

20% of the comparisons were not sown at the same time as the tall fescue pastures, and data from these sites has been excluded from this report.

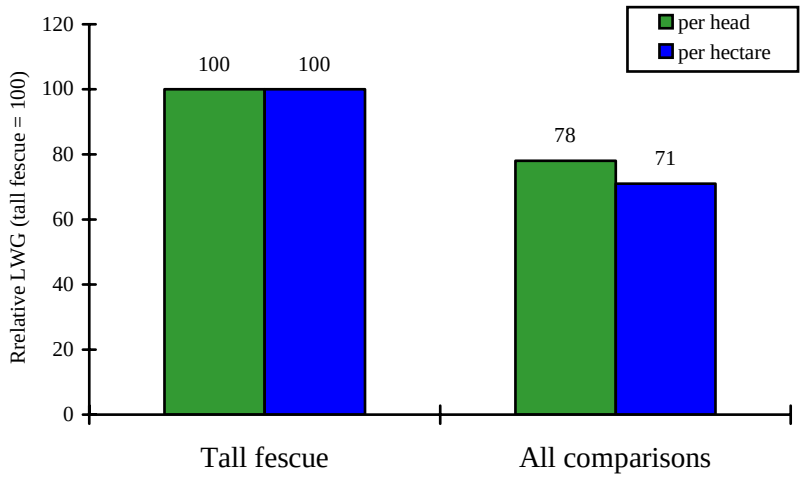
47% of comparisons were conducted over summer and autumn, 33% in spring and 20% in winter.

4.1. Animal production

The information in this section applies only to those sites where tall fescue and comparison pastures were sown at the same time.

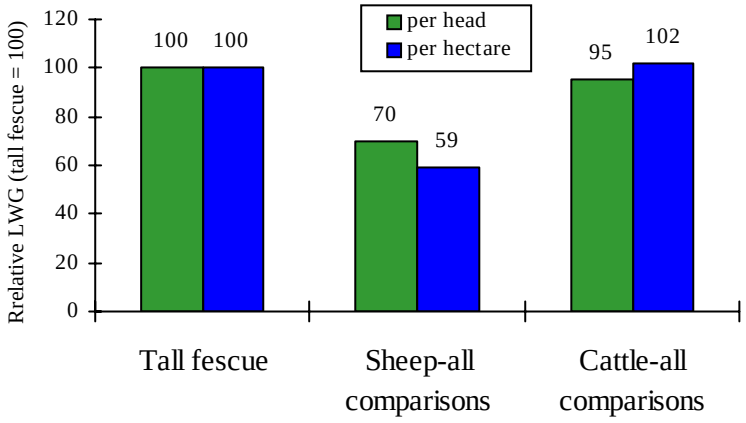
On average, the pastures sown to new tall fescue cultivars ("Tall fescue") produced 28% more liveweight gain per animal and 40% more per hectare, than all comparison pastures (Figure 4).

Figure 4. Liveweight gain of sheep and cattle on all comparison pastures relative to new tall fescue.



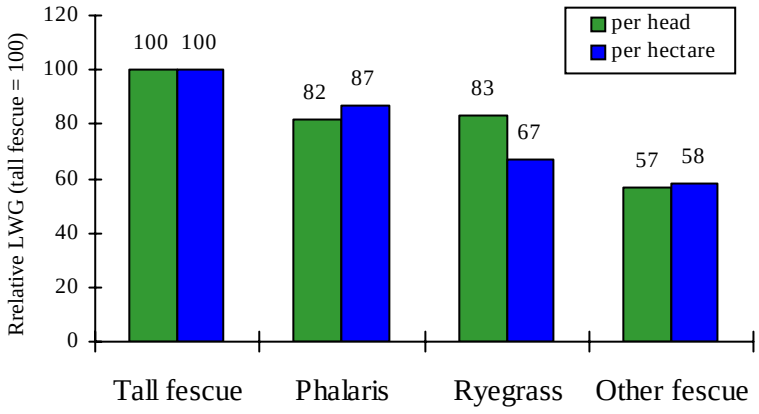
There were larger differences in liveweight gain between tall fescue and comparison pastures for sheep than cattle (Figure 5). This may be more related to seasons than animal species as 80% of comparisons with sheep were conducted in summer and autumn, and only 43% for cattle.

Figure 5. Liveweight gain of sheep and cattle on all comparison pastures relative to new tall fescue.



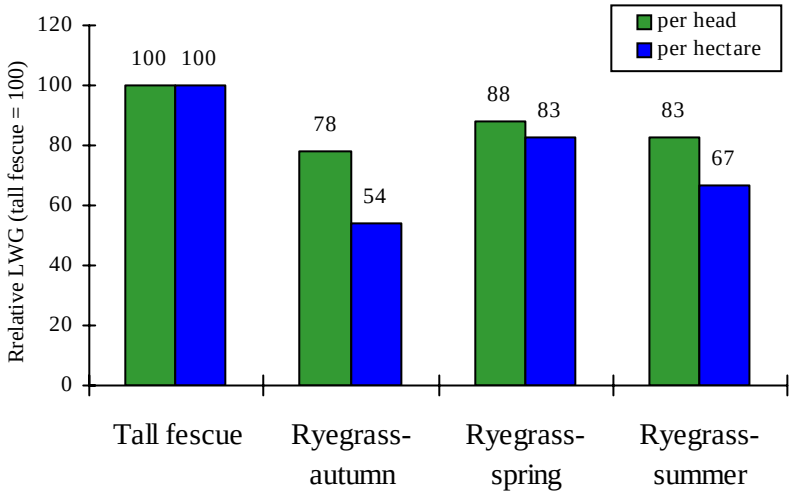
There were larger differences in liveweight gain between new and old tall fescue cultivars than between tall fescue and ryegrass, and tall fescue and phalaris (Figure 6). The differences in relativity for ryegrass and phalaris is also influenced by season, with 67% of phalaris measurements taken over winter and spring when phalaris is at its best, and only 22% of ryegrass measurements done in this period. This is further demonstrated in Figure 7.

Figure 6. Liveweight gain of animals on grass species relative to new tall fescue.



Differences in liveweight gain per hectare between new tall fescue and ryegrass were greatest in autumn and summer (Figure 7). This seems to be mainly due to less pasture growth and therefore less stock able to be carried.

Figure 7. Liveweight gain on ryegrass in three seasons relative to new tall fescue.



Sheep production differences between all comparison pastures and tall fescue, were greatest in summer and autumn. This was due to a combination of faster per head liveweight gain and more pasture growth. It suggests that sheep are more responsive to feed quality differences between new tall fescue cultivars and other pastures (Table 1).

4.2. Pasture quality

Five feed quality tests of whole pasture taken in conjunction with LWG trials show that, on average, tall fescue pastures had 25% more crude protein than perennial ryegrass comparators ($P<0.05$), and the same digestibility and energy levels (Table 1). This is similar to other studies.

Table 1. Average feed quality from five samples.

	Crude protein (% DM)	Digestibility (% DM)	ME (MJ/kg DM)
Tall fescue	16.6	74	10.5
Perennial ryegrass	13.3	71	10.2
	n.s.	n.s.	n.s.

4.3. Pasture persistence

Of the 28 sites sown, 4 did not establish successfully. Of the 13 sites established in environments suited to tall fescue, two failed to persist past 1999 (Figure 8). Of the 11 sites that established in environments not suited to tall fescue, five failed to persist past 1999 (Figure 9).

Figure 8. Persistence of sites in environments suited to tall fescue 4-5 years after sowing.

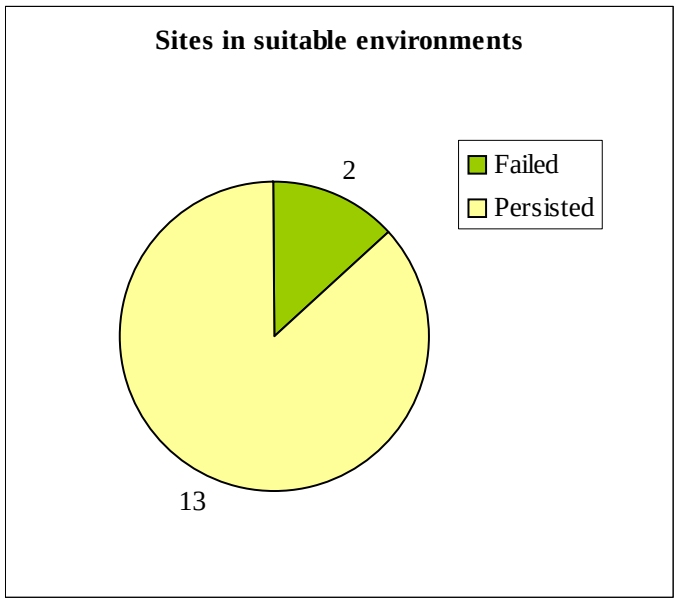
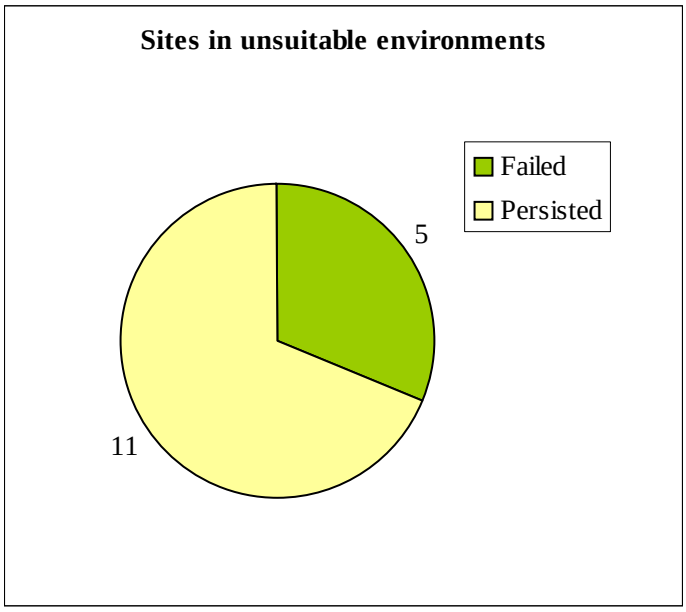


Figure 9. Persistence of sites in environments not suited to tall fescue 4-5 years after sowing.



Reasons for failure to persist in suitable environments included; contamination of invasive weeds not controlled successfully prior to sowing, unrestricted grazing in dry summer, and two very dry summers in a row (Table 2). Failures to persist in the unsuited environments were simply due to unsuitable soil type, and low summer rainfall (Table 2).

Table 2. Reasons for failure to persist

Site location	Reason
a) Suitable environments	
Kingston VIC	Contamination of invasive weeds not controlled successfully prior to sowing, and uncontrolled grazing in dry summer
Hamilton VIC	Two very dry summers in a row
b) Unsuitable environments	
Ararat VIC	Low average rainfall (550 mm) and two dry summers.
Forbes NSW	Poor establishment and paddock needed for crops
Holbrook NSW	Low average rainfall (550 mm), dry paddock chosen, and two dry summers.
Kongorong SA	Sandy soils
Clarence Town NSW	One unusually dry and hot summer in sub-tropical environment

These results suggest that the persistence of the new tall fescues is good when used in suitable environments with reasonable management. Persistence is expected to be poor on sandy soils, in areas with a Mediterranean climate and annual rainfall less than 600 mm, during harsh droughts, when invasive grass weeds are not controlled before sowing, and when grazing is uncontrolled in dry summers.

4.4. Economic benefits

An analysis of the on-farm benefits of tall fescue has not been done. However, in some cases the economic benefits of using tall fescue can be large, at one site there was a gain of $233/ha/month in gross income.

The key benefit of using some new tall fescue cultivars over older cultivars, cocksfoot and ryegrass, is increased animal growth rates. This gives farmers the advantage of bringing animals to a marketable condition sooner, or taking them on to a higher weight and sale price over the same time. Also, in some cases, the tall fescue pastures allow more stock to be carried, increasing income potential per hectare. Tall fescue has a seasonal advantage over phalaris and ryegrass by being able to grow strongly over summer while maintaining relatively good feed quality.

5. Impact of project

It was planned that the professional survey conducted in 1997 would be repeated at the end of the project, so that an objective measurement of the impact of the project could be made. The final survey was taken out of project objectives during a review of the project by the MLA. It is apparent that the project has had an impact on the adoption of new tall fescue varieties and changes to management practices, but it is not possible to quantify this impact. The following comments are therefore anecdotal and unable to be quantified.

Seed sales – since the start of the project and through until autumn 2000, demand for new proprietary tall fescue cultivars has exceeded supply. This is despite supply being increased substantially every year. An example of this is a seed retail firm in New England where in 1995 8% of tall fescue sales were proprietary cultivars, and in 2000 they make up 75%. In the same period total tall fescue sales have increased by 20%, at the expense of ryegrass and phalaris (D. Ryan pers.comm).

Changes to seed sales have also been noticed in other sectors. A staff member in a company that sells Demeter stated to Gavin Milne in 2000, “That Fescue project had a huge impact on Demeter sales, we have a client that would have taken a “semi-load” (up to 16 tonnes) of Demeter five years ago, but now would be lucky to buy a tonne off us. It’s (the market) been taken over by the new proprietaries”.

b) **Management practices** – the project changed management practices for tall fescue, and these were adopted by agronomists and farmers. The project brought about a change in attitude about how tall fescue should be used. In 1995 in New England, tall fescue was used as a component in pasture mixes with ryegrass, cocksfoot and phalaris, and used as a ‘general-purpose’ pasture. Now the new tall fescues are mainly sown as the sole grass in a mix and these are used as ‘special-purpose’ finishing pastures, with specific management applied.

Confidence in the best-practice management for the new fescues has contributed to their uptake, for example this quote from a New England reseller, “We needed technical information on the liveweight gain performance of the new cultivars before we had confidence to move our clients to change, otherwise things would have stayed the same. The project also gave us key management information and we now offer clients both the seed and a complete management ‘package’”. (D. Ryan pers.comm).

c) **Ongoing effects** - even in 2000, the project is being referred to by agronomists, and the management practices are being passed on. The Fescue Users Guide is still in demand. The confidence in the new tall fescue cultivars that the project has brought will see the successful use of them continue to increase.