Variety-specific management for seed production of creeping red fescue

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Introduction
Although in Canada, production of seed of creeping red fescue is produced in the Peace River region of Alberta and British Columbia. Although some of the seed is used domestically, the majority is exported to the USA, primarily to support the dairy industry. Since the mid-1970s, the publicly and genetically diverse variety Boréal has dominated the creeping red fescue landscape in Canada because of its superior seed yield over most other varieties, and its broad adaptation to North America and Europe. Although most creeping red fescue seed is produced and exported as ‘commercial seed’ (i.e., non-embryonic), its origin usually is broadcast back to the field and widely adapted Boréal. This project was conducted for Pickerel Canada who were interested in determining which variety or variety-specific management practices could be identified that would result in more economically competitive seed production of their Jaeger and Jaeger C (Nudiflorum endophyte-infected variety) varieties of creeping red fescue in the Peace River region.

Results
The environmental conditions were somewhat drier and cooler than normal during the growing season in which this study was conducted. The seed yields from the 3 fertilizer application treatments were not greater than those for the same amount of N applied in the fall only, therefore, to improve yields, this practice should be continued for both the first and second-year treatments. The N application in the fall only. Seed yield information is presented for the 1996 and 2000 seed production years and for the two-year combined. The yields over the two production years are presented to confirm that the normal cycle of seed production for creeping red fescue in the Peace region is the same as in other regions where Boréal is used. In the Peace region, the standard growing seasons are usually harvested for three consecutive years, reseeded without fertilizer input (by clipping, root addition and possibly sowing to an autumn grass), and then harvested again for another two consecutive years.

The majority of the variation in seed yield for the first and second production years and for the two years combined, was associated with the main effects of method of seeding, variety, fertilizer treatment, and post-harvest management. There was no statistically significant interaction between variety and fertilizer treatment, or variety and post-harvest management. The seed yield for the fertilizer treatment, the main effects of seeding for the combined seed yield over the two years. Although the other two-way treatment interactions were statistically significant (i.e., variety x method of seeding for the first and second year seed yields, variety x fertilizer treatment and post-harvest management x fertilizer treatment for the first, second and combined seed yields, and post-harvest management x method of seeding for the second and combined seed yields), the variance associated with these was so small that their agronomic importance is of little practical or economic value. Thus, the results illustrated will be related to those associated with the main effects of seeding, variety, fertilizer treatment, and post-harvest management.

Materials and Methods
A field study was designed and established in 1996 at Beaverlodge Research Farm to evaluate the seed-producing potential of three varieties of creeping red fescue under a broad range of crop management practices. The varieties were the local standard, Boréal, and the industry partners, Jaeger E and Jaeger C. The experimental treatments included 4 methods of stand establishment (broadcast, 10 cm rows, 15 cm rows, 15 cm rows with sulfur sorbent (50 lbs) broadcast, and 25 cm rows), 2 methods of post-harvest management (re-seeding to 10 cm growth in fall and residual), 2 fertilizer treatments (35 kg ha⁻¹ N in the fall only or 35 kg ha⁻¹ N in the fall and 45 kg ha⁻¹ N in the spring), and 10 nitrogen (N) fertilizer treatments for which the N was broadcast at the same time of N in the spring (14 N, 21 N, 28 N, 35 N, 42 N, 49 N, 56 N, 63 N, 70 N, 77 N). The broadcast nitrogen treatments were applied in two 1996 and two 1998. Seeding and harvest treatments were two 1996 and two 1998. In the fall, a two-year combined seed harvest was harvested in July/August 2000. The plants in the 0 cm 5 cm of each 8 cm in length in the treatment plots were harvested for the 1996 and 2000 seed production years.

Conclusions
1. Seed yield of creeping red fescue was greater over two consecutive production years when sown on 12 cm rows, although a higher first-year yield may be realized using 6 cm rows. In the first production year, seeding in rows of 6 cm rows yielded higher seed yield than broadcasting last. In the second, the converse was true.
2. There was no beneficial effect of supplemental fertilization with 3 kg ha⁻¹ N in the fall only. Fertilizer treatments were not statistically significant for the corresponding production years. Jaeger E produced 96, 95 and 90% of Boréal, and Jaeger C produced 95, 76 and 68% of Boréal. The endophyte infection of Jaeger E was particularly beneficial for seed yield in the second production year.
3. For the 2000 production year, the second production year, seed yields of Boréal were 65, 73 and 102 kg ha⁻¹, respectively, for the corresponding production years, Jaeger E produced 96, 95 and 63% of Boréal, and Jaeger C produced 95, 76 and 68% of Boréal. The endophyte infection of Jaeger E was particularly beneficial for seed yield in the second production year.
4. For the 2000 production year, the second production year, seed yields of Boréal were 65, 73 and 102 kg ha⁻¹, respectively, for the corresponding production years, Jaeger E produced 96, 95 and 63% of Boréal, and Jaeger C produced 95, 76 and 68% of Boréal. The endophyte infection of Jaeger E was particularly beneficial for seed yield in the second production year.
5. The second-year response of creeping red fescue to the fall-applied fertilizer differed for some varieties of production. For the first production year, the second-year response of creeping red fescue to the fall-applied fertilizer differed for some varieties of production. For the first production year, the second-year response of creeping red fescue to the fall-applied fertilizer differed for some varieties of production. For the first production year, the second-year response of creeping red fescue to the fall-applied fertilizer differed for some varieties of production. For the first production year, the second-year response of creeping red fescue to the fall-applied fertilizer differed for some varieties of production. For the first production year, the second-year response of creeping red fescue to the fall-applied fertilizer differed for some varieties of production. For the first production year, the second-year response of creeping red fescue to the fall-applied fertilizer differed for some varieties of production.
6. The results suggest that, over the two-year production cycle, seed yield of creeping red fescue might be enhanced further by a fall application of N to 100 kg ha⁻¹. In the establishment year following one of 50 to 50 kg ha⁻¹ the first fertilization year. However, this strategy of fertilization requires experimental verification.

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Effect of Variability on Seed Yield of Creeping Red Fescue

Effect of Rate of Nitrogen Fertilizer on Seed Yield of Creeping Red Fescue

Relative Seed Yield of Creeping Red Fescue as affected by Rate of Nitrogen (in equations, N = Bicarb fertilizer nitrogen and must be between 34 and 102 lb/acre.)