



Native grass seed development for the west coast of BC

by Manivalde Vaartnou, PhD, PAg
M. Vaartnou & Associates, Richmond, BC

When ground is disturbed by forestry or other development activities, one recommended response is to apply a fast-growing grass seed mixture—a quick and effective restoration technique that helps prevent soil erosion and runoff into nearby water courses. On the west coast of British Columbia, applying non-native grass seed mixes through dry seeding, wet broadcast seeding, or hydroseeding has been used for years to prevent soil erosion in forestry operations. But how many times have



Dave Polster photo

The annual field day/open house at the seed increase nursery at Cairnpark Nursery Services Inc. in Duncan, BC.

you stopped to ponder whether applying non-native grass seed is really the best way to promote restoration? According to current thinking, sound ecological restoration includes using native species as much as possible, for a number of reasons, including:

- retaining local biodiversity,
- higher long-term survival because of adaptation to local climate,
- greater reseeded potential because of adaptation to the local photosynthetic regime,
- lower costs through lower fertilization and seeding rates,
- less rapid colonization by undesirable invasive species, and
- a more harmonious landscape.

Until recently, using native seed for reclamation has not been a commercially viable proposition on the west coast of British Columbia. Native seed for large-scale reclamation purposes was not available in large enough quantities or at a price comparable to non-native mixes. In 1996, this gap in knowledge and technology inspired the initiation of a very successful 10-year applied research program to investigate whether a commercial-level seed source from native west coast grasses could be developed for reclamation and sediment-control uses. Funded initially by Forest Renewal British Columbia, and

later through Forest Investment Account (FIA) funding via Weyerhaeuser Company Ltd., Cascadia Forest Products Ltd., International Forest Products Ltd., Western Forest Products Inc., TimberWest Forest Corp., Canadian Forest Products Ltd., and the British Columbia Ministry of Forests and Range, the project's two goals were to:

- 1) determine which west coast native grasses could be best utilized in revegetation; and
- 2) establish which native grasses produce sufficient seed for commercial seed production and sale at a reasonable price.

Results from this project are applicable to the Coastal Western Hemlock (CWH) biogeoclimatic zone of Vancouver Island, and are likely applicable to the CWH biogeoclimatic zone on the adjacent mainland coast, and to the Coastal Douglas-fir (CDF) biogeoclimatic zone on Vancouver Island.

To produce a commercially viable product for large-scale use, the following three conditions needed to be met:

- 1) There must be sufficient native seed available for large-scale use by major seed users.
- 2) Native species trial plot results must be, at least, comparable to results achieved on control plots of introduced agronomic species.
- 3) While initial costs may be higher, the long-term cost of native species seeds must be no more than minimally higher than the cost of agronomic seeds.

In 1996 and 1997, seeds of native grasses were collected from the wild and then sown to flats in the University of British Columbia greenhouse. Emergent seedlings were transplanted to a seed increase nursery established in Duncan, BC and were then harvested and used to establish trial plots throughout Vancouver Island. Five different native seed mixtures were created and each was seeded to six locations. At each location a control plot was seeded to introduced, agronomic species. Ground cover was evaluated annually at each location using the "Daubenmire" system (<http://beta.darp.aspensys.com/northwest/cbay/pdf/cb-mon1m.pdf>) until five years of data were available from each site. Subsequent biometric analysis of the

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Native grass seed is effective

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ground cover data showed no differences in cover production between the native mixtures and the control mixtures. Demonstration sites were also established at locations that could not be replicated because of a lack of homogeneity in site characteristics, and, in the last five years of the program, large operational sites were seeded to the most successful native species. The demonstration and operational sites were also evaluated for five years.

In all cases, results with the native grasses were equal or better than the agronomic species. The most successful species were *Bromus sitchensis* (Alaska Brome), *Deschampsia cespitosa* (Tufted Hairgrass), *Deschampsia elongata* (Slender Hairgrass), *Elymus glaucus* (Blue Wildrye), *Festuca rubra* ssp *arenicola* and *Festuca rubra* ssp *pruinosa* (Red Fescue). The first step in future field-scale seed production of these species was taken in 2004 with transfer of seed stock to Pickseed Canada Inc., and the establishment of seed multiplication plots in Oregon. Other successful species with market potential are

Agrostis exarata (Spike Bentgrass), *Agrostis scabra* (Hair Bentgrass), *Bromus carinatus* (California Brome), *Calamagrostis stricta* (Slimstem Reedgrass) and *Poa compressa* (Canada Bluegrass). In 2005, seed of these latter species was also transferred to Pickseed Canada Inc., and seed multiplication plots were established in Oregon for them. The decision for future commercial seed production will be based on the potential market for each species.

Many forest companies recognize the potential short- and long-term benefits of using native grass seed. Given that the seed is as effective (or better), both in cover (short and long term) and expense, both International Forest Products Ltd. and Western Forest Products Inc. have committed to preferentially using a full or partial component of native grass seed in their Forest Stewardship Plans to manage the introduction and spread of invasive plants. The BC Ministry of Transportation is also considered a significant market for the use of native seed. 