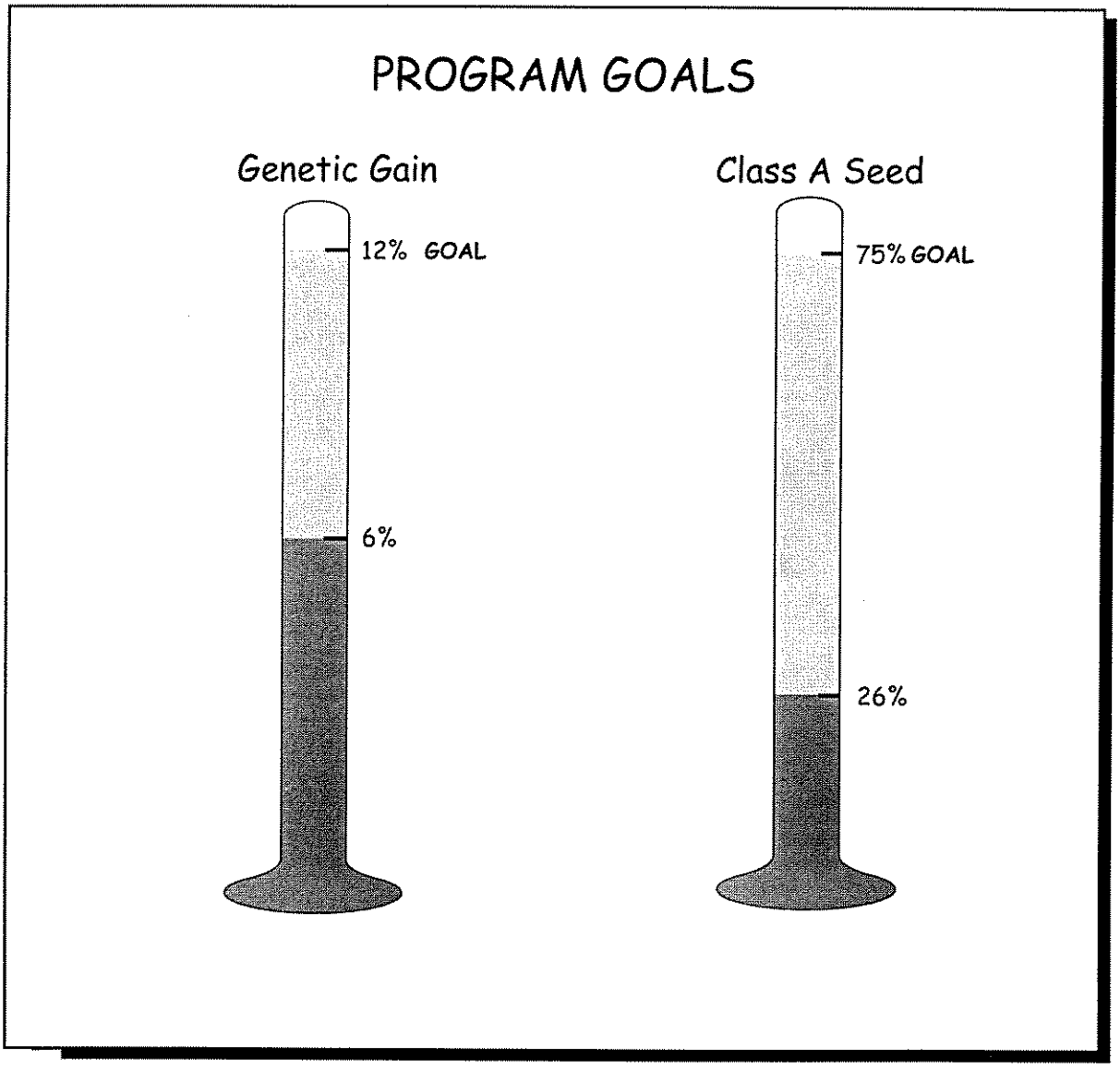
DUE DILIGENCE STRUCTURAL REVIEW OF THE PROPOSED OPERATIONAL TREE IMPROVEMENT PROGRAM



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EXECUTIVE SUMMARY

The BC Tree Improvement Council (TIC) has requested incremental funding of $120 million from Forest Renewal BC (FRBC) to expand and accelerate its Operational Tree Improvement Program (OTIP) over a ten-year period. This report, commissioned by FRBC, summarises a "due diligence" structural review of the FRBC-OTIP proposal. In this document we examine available models within and outside the tree improvement community, review existing conditions and constraints, develop an appropriate model for this initiative, and provide structural and financial guidelines for its implementation.

The FRBC-OTIP goals are to:

1. Increase the percentage of class A seed from 26% to 75% by 2007;
2. Increase the average genetic gain in this seed from 6% to 12% by 2007; and
3. Develop and implement a gene conservation strategy.

Review of models

Canadian programs such as Forintek and the Forest Engineering Research Institute of Canada (FERIC) were reviewed, as well as co-operative tree improvement programs in the southern USA, New Zealand, United Kingdom, and the Pacific Northwest (see Chapter 2).

Incentives to use genetically improved stock are critical, and largely lacking in BC. Durable co-operative arrangements between public and private sector partners require careful planning, but can be developed.

Review of conditions

Necessary conditions for successful implementation of FRBC-OTIP are detailed in Chapter 3. Clear guidelines for joint control of program planning, information sharing, and funding are crucial. Costs and benefits should be shared. Co-operative planning, program management and monitoring systems will be required within a competent, mandated FRBC-OTIP agent.

Market-oriented activities and structures will best serve the goals of the initiative over the next decade.

Key program elements are:

- genetic conservation;
- tree breeding;
- seed production;
- extension, education & training
- program management; and
- Seedco management.

Coverage of these program elements must be balanced.

Sustainable relationships must be developed and maintained between all important participants. These are the BC Ministry of Forests (MoF), forest-based companies, FRBC, and various publics. These relationships will require continuous and transparent communication.

Suggested model

The review team recommends that a partnership model (detailed in Chapter 4) be adopted. This model will facilitate true power sharing between public and private sectors. The team also recommends a clear focus on market-oriented seed pricing, seed orchard ownership, and incentives for improved seed use.

Proposed investment schedule

Chapter 5 provides suggestions for financial planning over the program period.

Conclusions and recommendations

The FRBC-OTIP initiative is worthy of immediate funding.

Necessary conditions for program success are not all in place. While the technical aspects of attaining the stated goals are well defined, the planning, communication, and business management components are insufficiently developed. The FRBC-OTIP initiative will require that management planning be explicit and efficient, and that extension, communication and education are thoroughly addressed.

The following points are critical.

- A substantive business plan is essential, and urgently needed.
- A true partnership between the public and private sectors should be implemented, so that power, responsibility and benefits can be shared.
- FRBC should be viewed as an investment banker, for the duration of this project.
- TIC and FRBC-OTIP must be open, transparent, and competitive.
- Communication, extension and training efforts, within and outside the partership, should be increased.
- Interference in the market should be avoided.

6. FINDINGS AND RECOMMENDATIONS

Planning

1. Planning should be by programs and activities, and should be goal-oriented.

Project planning should reflect the partition of goals and programs into separate budget lines, as originally outlined in the *Strategic Plan for Forest Gene Resource Management document*, and depicted in **Figure 1**. These program streams are:

Program 1:	Genetic conservation
Program 2:	Tree breeding
Program 3:	Seed production
Program 4:	Extension, education and training
Program 5:	Program management
Program 6:	Seedco management

2. Planning documentation should be complete and business oriented.

The main focus of existing program planning documents is on tree breeding activities, with less emphasis on seed production, and very little or no detail in the other four areas. Much work is needed in both structure and detail.

3. A substantive business plan is essential and urgently needed.

A business plan must, at a minimum, profile for the next ten years:

- FRBC cash flow ;
- expected MoF TIP and related cash flow (excluding FRBC funds);
- expected costs of improvements to seed orchard operations; and
- estimated net Class A seed sales.

A broad, complete, outline of projected expenditures over the ten-year period, summarised over regions and species, should be included.

A business plan should also include anticipated time frames and mileposts for achievement of performance goals; for example a graphical representation of expected genetic gain and proportion of class A seed used, over time.

4. There is a need to fund production as well as breeding.

Deployment of class A seed is to increase by 300%. Much of this increase will come from natural increases in cone production by maturing orchards, but there is also a recognised need for new orchards and second-generation orchards to reach the stated goals. These needs are not detailed and substantiated.

5. FRBC should be viewed as an investment banker for the duration of this project, not as a permanent partner.

FRBC's investment is to accelerate, strengthen and increase existing tree improvement activities. FRBC does not want to replace existing budgets. It is very important to have a tracking system for incremental funding. The partnership model, in Schedule B, requires for the project period the estimation of regular or non-FRBC funding levels for MoF and the private sector. Otherwise, FRBC funds may simply replace existing funding and the net effect will be zero over the decade.

6. TIC needs to be open, transparent, and competitive.

As the spending of public, private and FRBC money increases, there is a stronger need for TIC to be seen as open and transparent. More effort is needed to communicate calls for proposals; and reports should be freely available and more widely circulated.

A web site would be a good source of minutes, activities and other information. All TIC reports should be available on line. This would contribute to the information base, improve transparency and give the program visibility. We recommend a common numbering system and common cover stock for printed reports (as used for FRDA and RIC reports).

7. Communication, extension and training efforts should be increased.

Communication, extension and training mechanisms are in place, but their structure and focus should be re-examined to ensure that they are meeting the needs of all participants, including MoF, industry, and the public. Accessibility appears to be limited.

8. Powerful advocates are required to champion the program.

A cadre of champions will be needed for each major audience. TIC could choose a committee of advisors whose role would be to give broad project guidance on communication of policy issues and program progress.

9. A rigorous accounting system is required.

There is need to have an audit trail of FRBC incremental funding. TIC should prepare an annual report that attributes FRBC money to specific programs and quantifiable results. The annual report should also report variances of MoF and private sector annual expenditures vs. budgeted expenditures, to ensure that regular funding is not reduced as incremental funding increases. Variance of performance relative to quantitative goals should be reported. It is also important to show the effects of incremental FRBC funding.

10. A review of possible funding mechanisms should be started quickly.

A variety of grants, direct project funding, endowments and incentive loans could be used to support tree improvement activity. The partnership model outlined in Chapter 4 provides an initial outline format.

11. Spending should be goal-oriented.

When reviewing proposals and activities, evaluation criteria should focus on expected results and how they will move the program towards stated goals and targets. TIC also needs a clear, relatively independent ability to monitor performance to ensure projects are achieving projected results.

12. Consider more single-focus research.

We suggest that a slight change in focus for operational breeding may be productive; if a defined group of breeders focussed purely on genetic improvement, a regulatory/monitoring group could more readily assess programs and plans for genetic conservation issues.

13. Innovation should be encouraged.

There is a need to encourage innovation in delivering gains. Results-driven research will find a way to package and deliver genetic gains on a large scale while observing other constraints, such as genetic diversity.

14. Privatisation of MoF orchards should be considered.

Private sector representatives were almost unanimous; MoF should concentrate on tree breeding activities, and MoF seed orchards should be privatised. The review team concurs with this recommendation, while recognising that that this is a complex task. MoF should establish no new orchards. New orchards should be encouraged in the private sector, so that MoF may concentrate on breeding and gene conservation issues.

15. Avoid market interference.

The recent increase of class A seed prices to five times those of wild seed was an excellent MoF decision, in view of the FRBC-OTIP goals. However, further extensive market controls and intrusions should not be encouraged. This decision should be periodically reviewed in the light of FRBC and TIC progress.

Incentives and regulations

16. Tree improvement pays.

There is consensus among MoF staff, economists and business people that tree improvement can pay dividends and makes good business sense. "Improved seed doesn't cost - it pays".

17. FRBC-OTIP needs seed certification labels.

There is a need to certify genetic gain and survival improvements (e.g. "rust resistant" or "weevil resistant"). Seedco's role would be to make it happen. The actual certification could be contracted out but Seedco should set the protocol. This would be a positive way to influence the market price without market intervention.

18. There are insufficient incentives for full industry participation at present.

Tree improvement benefits are not well distributed. This problem is linked to issues of land tenure, resource rents and expected future benefits, and is beyond the scope of this study. However, unless incentives are provided, industry commitments will remain cautious. Furthermore, this chosen level of participation has very wide and important ramifications in the sector; it also has a rational basis. Without industry's enthusiastic support, the BC tree improvement program will essentially remain a program directed and managed by government.

19. Avoid regulations and embrace incentives.

Regulations (such as FPC regulations governing deployment of class A seed) may require compliance, but they will not stimulate the desired levels of involvement.

The review team recommends that FRBC-OTIP promote increased private sector activities (e.g. work towards incentives for increased production and use of improved seed). MoF should also avoid reliance on regulatory approaches where possible. This will require transparent allocations of resources where feasible.

Cooperative relationships

20. A partnership model, as developed in chapter 4, is recommended.

The review team recommends that the FRBC-OTIP should be structured as a partnership model.

21. Industry does not have a share in power or profits.

The OTIP program is apparently designed to be a "co-operative" at least in philosophy, if not a true co-operative in legal terms. A co-operative implies common directions, power sharing and a sense of community, in that the project is jointly owned and members share benefits. TIC has succeeded in gaining agreement in principle, but the conditions for real, long-term industrial enthusiasm is lacking. Possible short-term incentives should include adjacency benefits, as more rapid early seedling growth may provide for industry cost savings, and improved, more timely access to future harvests. Longer-term potential benefits include industry access to increased harvest through an allowable cut effect (ACE). Tenure questions and definitions in BC will be important.

It is the opinion of the review team that unless the public sector is successful in pulling industry into the program through incentives, as opposed to pushing with FPC regulations, the program will not become a true partnership. The proposed FRBC-OTIP partnership program, with its "sign-off" requirement, can be a sound first step along an admittedly difficult road.

22. Alternation of private and public sector minute takers at TIC meetings is recommended.

Such basic elements of a co-operative structure at TIC meeting should help communications between MoF and industrial partners on key issues, and should assist in the delineation of solutions.

23. The Chief Forester's options in forest stewardship are limited but real.

The Chief Forester has a stewardship responsibility that is based in law. The office is required to take a long-term, comprehensive view of the welfare of public forest resources in BC. FRBC-OTIP programs and projects will need to consider his responsibilities. At the same time there is significant room for flexibility in allocating tasks to public and private sector co-operators as long as forest stewardship is not compromised.

24. Tree improvement needs an improved model to survive future forest sector challenges

Industry and government are both subjected to budget constraints, downsizing and "re-engineering" exercises. If the right programming and financing mechanisms are put in place, tree improvement will come through with flying colours. The challenge is to put tree improvement on a firm business footing. In part, this will mean moving seed sales towards more robust market conditions in BC.

Seed price

25. The price system allocates resources.

If seed price is high, suppliers have an incentive to increase production. The OTIP goal is to increase class A seed production by 300% by 2007. The price of seed will be a crucial issue. Seed price (from all orchards) will have to reflect the cost of production plus some margin for profit and risk if the OTIP-FRBC goals are to be met.

26. Seed prices should be market-driven to the extent feasible.

There are imperfections in current seed markets in BC, since:

- the FPC requires users to buy, and
- seeds are sold by near-monopolies in each species/seed zone.

However it does not necessarily follow that in such imperfect markets, all sellers are predestined to "gouge" seed buyers (Appendix 1). While there may be some pricing problems, it is most likely that they will be short-term and self-correcting. Short-run market interventions in pursuit of "fairness" creates more problems than they solve.

27. Robust markets are not always orderly or predictable.

A "robust market" in BC for tree seeds is possible; however, it will not be perfectly orderly or always predictable. Seed prices will fluctuate, but will tend to be self-correcting and, in the long run, will bring about lower-priced seed and an efficient production function. Well-designed seed storage systems can help smooth out market gyrations over time.

28. The practice of trading wild seed for class A seed appears questionable.

More logical seed supply management will be required to achieve FRBC-OTIP goals. The Surrey Seed Centre is currently overstocked with wild seed, holding an estimated 14-20 years' worth of seed. The current practice of trading 1.5 kg of wild seed for 1 kg of A class seed was instituted to encourage use of class A seed, but is likely to be counter-productive to FRBC-OTIP goals. The Surrey Seed Centre should be able to adopt revised inventory control strategies that both meet MoF requirements and help to work towards FRBC-OTIP goals for tree improvement.

29. Northern interior activity will be key to achieving FRBC-OTIP goals.

Given the volume of seedlings planted, TIC should be aware that success in the northern interior is key to meeting TIC's goals. More TIC meetings should be held in the interior with field trips being part of the meeting.

30. Sowing rules should be reviewed to better reflect true seed cost and genetic worth, in relation to nursery costs.

Seeds with high genetic worth should be sown in a manner that maximises the number of seedlings leaving the nursery, within balancing constraints of nursery or other costs. For example, if a nursery experiences extra costs due to empty container cavities, this may or may not be greater than the total production cost plus opportunity cost of multiple sowing with improved seed. The sowing rules for class A seed may be worthy of revision while there is a shortage of class A seed for some seed species/zone combinations. Only where there is a surplus of class A seed, sufficient inventory, and a secure production flow, then class A seed could be price discounted to allow nursery efficiency to govern decision making.

31. Genetically improved seed adds less than $0.01, or 1%, to the cost of a planted tree.

With the current pricing structure (5 x wild seed, for MoF orchards), genetically improved seed adds very little to the expense of reforestation.

Goals

32. The existence of measurable goals is more important than their level.

Careful definition of FRBC-OTIP goals will be critical to the success of the program. While the achievability of technical program goals is the mandate of a separate "due diligence" review, it is important to note that continuing, explicit attention to goals is more important that the initial levels targeted.

33. Non-quantifiable, enabling goals are equally important, and are can be monitored.

Two of the four original program components (tree breeding and seed production) have measurable goals; the other two (genetic conservation, and extension, education and training) though not clearly quantifiable, are equally important. In fact they are too important to be left without defined targets for extended periods. MoF and FRBC-OTIP should define specific target accomplishments for these crucial program dimensions as soon as possible.