Stand Rehabilitation Financial Analysis

(ROI)

- Frequently Asked Questions -

BC Ministry of Forests
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ROI Field Cards

1. Why do I get higher maximum cost values from the lodgepole pine chart as compared to the other two charts?

Trees grown at low densities maintain a long live crown. In some species, fibre quality is relatively poor in the portion of a stem grown under the direct influence of the live crown. While problematic in all species, this "juvenile wood" is of particular concern in lodgepole pine, and results in poor lumber strength and excessive warpage in the drying process. The following contrived example illustrates how this affects values in the ROI field charts:

Assume that a typical sawlog has a value of $\$50/m^3$, and that all species produce a similar volume on the same site. Due to a high proportion of juvenile wood, however, the average value of pine logs grown at a density of 600 trees/ha is only $\$30/m^3$. With some further assumptions about harvest volumes, we can then calculate harvest revenues for the treated and untreated stands for pine compared to interior spruce

	Lodgepole Pine		Interior Spruce	
	Untreated	Treated	Untreated	Treated
Estab. Density	600 tph	1400 tph	600 tph	1400 tph
Harvest Vol. (age 80)	300 m^3/ha	400 m^3/ha	300 m^3/ha	400 m^3/ha
Net Log Value	$\$30/m^3$	$\$50/m^3$	$\$50/m^3$	$\$50/m^3$
Net Harvest Revenue	\$9000/ha	\$20,000/ha	\$15,000/ha	\$20,000/ha

From these values, we can then calculate maximum treatment expenditure:

	Lodgepole Pine	Interior Spruce
Value Gain from Treatment	\$11,000/ha	\$5000/ha
Discounted Gain (75 yrs @ 2%)	\$2490/ha	\$1130/ha

The discounted value gain, then, becomes the maximum we can invest to achieve a 2% return on investment.

Note that future versions of these cards may incorporate value adjustments for species other than lodgepole pine.

2. How do the ROI charts affect species selection for planting prescriptions?

The selection of an appropriate chart should in no way influence species selection for reforestation – the choice of chart is based solely on the currently existing species. In planning a prescription where the planted species differs from what currently occupies the site, you will be deviating from the simplifying assumptions that were necessary to build the charts. It is important, then, to be cognizant of the following:

Caveat 1. Where a species shift is planned (a different species will be planted that what is currently the most prevalent species), an additional margin of uncertainty is required. Maximum expenditure values should be interpreted with at least a +/- 40% margin of error.

Caveat 2. Where a species shift is planned and where a fully stocked stand of the new species will have a significantly greater cMAI than a fully stocked stand of the original species, the field sheets will underestimate the maximum allowable expenditure. The magnitude of this underestimation is highly variable based on several factors such as the current stocking and the relative magnitude of the productivity differences.

3. Do the charts incorporate “genetic worth” for improved planting stock?

No. If genetically improved seed is to be utilized for prescribed regeneration, the field cards will underestimate maximum allowable expenditure.

ROI Worksheets

1. **Does the worksheet accurately compensate for an untreated stand that is say 20 – 30 years older than the treated stand? We changed this a few times and it didn't seem to change the ROI much.**

The worksheet assumes that all trees in the treated and untreated stands are roughly the same age. This matches the TIPSY yield curve assumption of an even-aged stand. The assumption is reasonable for fill plant situations where the untreated stand is quite young – say less than 5 or 6 years. Where a fill plant occurs in older stands, this assumptions starts to break down, and gets more serious with greater age disparities. I've described one possible way of adjusting prediction for such situations (crude but reasonably effective) in Appendix 2 of the worksheet documentation.

2. **The default silv. costs and overhead in the TIPSY economic calculator are very unrealistic. I entered my own (and more realistic) numbers today and then re-ran the worksheet. Changing these numbers doesn't seem to affect the ROI calculation. Why is this?**

The silviculture and overhead costs from TIPSY apply to logging and reforestation costs for a future harvest. Since both the treated and untreated stands will experience these costs, they largely cancel each other out. The only reason they don't completely cancel out is that the harvests may be projected to occur at different times, resulting in different discount periods.

3. **I ran two versions of untreated; one with only $50/ha. silv. cost and one with $450/ha. (I added a B&W) and the ROI came out exactly the same. How can this be?**

If you are referring to changed silviculture costs in TIPSY Economist, then you should not see any changes in the ROI as these values are not carried over to the ROI Worksheet (silviculture costs are entered in the ROI worksheet, not TIPSY).

4. **I read a couple of times that if you change any of the default economic assumptions, you need to change them all. I accepted some such as haul cost, tree to truck and milling cost since they seemed fairly realistic, but changed overhead and silv. treatment. Maybe the model does not accept any of my inputed numbers then? I definitely need clarification on this.**

The main point here is that all costs should be expressed in dollars with the same reference year. If you change some of the values to reflect current costs, but the remainder are in TIPSY's default 1996 dollars, some of the values will adjusted for inflation and others won't be. Overall, however, the effect will be quite small.

5. **What do you put down for stand establishment date if the untreated stand is still naturally filling-in?**

For naturally regenerated stands, use the year by which approximately half of the existing stocking had germinated. Where the stand is not yet established, specify the current year and utilize an appropriate regeneration delay in the untreated TIPSY runs.

6. **What do you use for regeneration delay when the understory stand is already established?**

Where the untreated understory stand contains seedlings that are already established you could use a regeneration delay of 0 if you do not anticipate significant further ingress.