

PREDICTING OUTCOMES

Newsletter from the Stand Tending Unit, BC Ministry of Forests, Forest Practices Branch

NOVEMBER, 2000

Editor's Note

This is the fifth in a series of newsletters that provide updates on the activities of the Stand Tending Unit, Forest Practices Branch, BC Ministry of Forests. Although the Stand Tending Unit is involved in many activities, this series of newsletters is focused on a single theme—predicting outcomes of stand-tending treatments.

I hope you enjoy the brief, informal articles in this newsletter. Subsequent issues will be produced periodically if time and resources permit.

If you have any comments on anything you read in this newsletter, please contact me.

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Assessing response with an increment borer

It was a nice sunny day in a stand near Cranbrook as we passed around the increment core from a tree in a stand that had been spaced 15 years ago (Figure 1). Yes, we all agreed—we sure got a good response to spacing. Or did we?

Response is the change due to treatment. When we examine the increment core, we compare ring widths in a time period before treatment with ring widths in a time period after treatment—and assume that the difference (if any) is the result of treatment. Unfortunately, it's not that simple. Ring widths change over time for many reasons—not just in response to treatment. Consider the ring-width pattern (Figure 2) in this dominant Fd tree on a poor interior site: rings narrowest near the pith, widest at about 25 years from the pith, and narrowing after. This pattern does not indicate a response to treatment—this tree has never been treated. This is simply the tree's natural growth pattern, a pattern

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Figure 1 Ivan Listar and Denis Petryshen examine an increment core.

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common to many freely growing trees. These naturally occurring changes in ring widths over time can combine with the changes caused by treatment and lead you to overestimate—or underestimate—the impact of treatment.

Ring widths are very sensitive to environmental conditions. Consider this hypothetical example for a Pl tree (Figure 3). In the five years before treatment, droughts were uncommonly severe. In the five years

after treatment, summer droughts were rare, but several *Lophodermella* defoliations occurred. In this case, what conclusion about treatment response can be drawn from comparing ring widths before and after treatment? I say, “None.”

We tend to core trees at breast height and assess ring patterns at that point, but it’s useful to remember that trees add increment along the entire length of their stems. Some treatments shift slightly the distribution of growth along the bole. For example, pruning usually reduces radial increment at breast height more than it reduces radial increment in the upper stem. So, a change in ring widths at breast height may provide a misleading picture of the total change in increment from treatment.

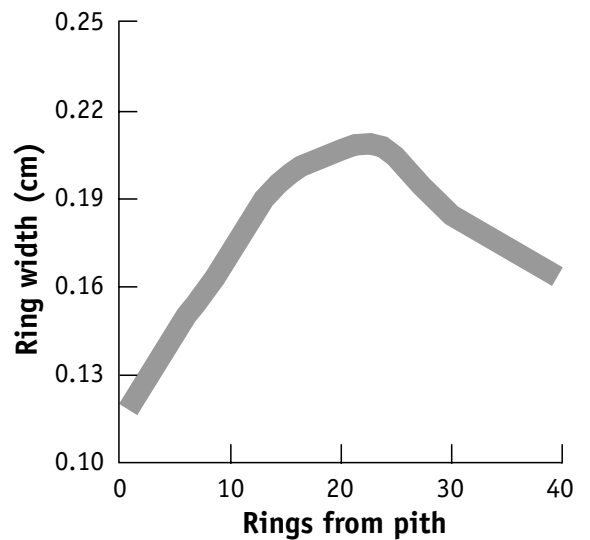


Figure 2 Even without treatment, ring widths change from pith to bark.

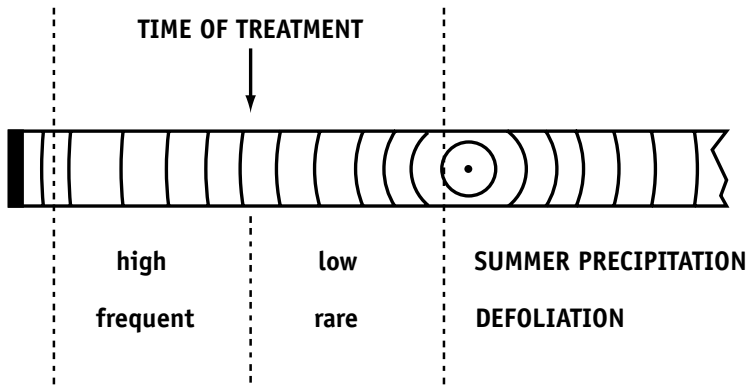


Figure 3 Many things—not just treatment—influence ring width.

Frequently, we are most interested in the stand-level response to a treatment—for example, the increase in volume/ha. Typically, response differs among trees of different species and sizes within a stand. A conclusion drawn from coring a single tree, trees of a single species, or trees from a single size class may provide a poor indication of stand-level response.

In some cases, the response we want from a treatment has little to do with diameter growth. The objective of a thinning may be to make the microclimate of the stand less suitable for beetles. The objective (or one of the objectives) of a fertilisation may be to increase understory biomass to provide more browse. In cases like these, a change (or lack of change) in ring widths indicates little about whether or not the desired response was achieved.

So, thinking back on Cranbrook, I remain a believer in having a look at the trends in ring widths over time. Such sleuthing is part of developing a plausible “story” about how the stand is developing—and how it is responding (or will respond) to treatment. This is part of the art of silviculture. However, I know that the increment core can tell only part of the story and it’s important to bear some of the proceeding cautions in mind.

If you want to discuss this issue, call Pat Martin at 250-356-0305.

Spacing Quality Inspection Booklet

To produce maximum benefits from incremental silviculture, field operations must be conducted to high standards. The Stand Tending Unit produces systems for checking the quality of fieldwork. The Unit released a working draft of a revised juvenile spacing quality inspection procedure this summer. The revised inspection system focuses on selecting the best crop trees using criteria that include the size, health, and species of the crop tree. The new inspection system also links to the content requirements of the Stand Management Prescription to ensure that field operations achieve their objectives.

The new booklet is available at <http://www.for.gov.bc.ca/hfp/pubs/standtending/JSQIP%2000-06-01.pdf>. Use of the draft inspection system is encouraged but not mandatory. Comments received will be incorporated into the final version of the booklet for use in the spring of 2001.

If you want to discuss the new inspection system, call Brian Raymer at 250-387-8909.

On the Web

Previous issues of Predicting Outcomes at:
<http://www.for.gov.bc.ca/hfp/PubsStandTend.htm>

July 2000 release of PrognosisBC at:
<http://www.for.gov.bc.ca/research/gymodels/progbc/Software/software.htm>

March 2000 update of *Just the Facts*
(a compendium of BC silviculture statistics for 1981-1998) at:
<http://www.for.gov.bc.ca/hfp/forsite/jtfacts/index.htm>

PrognosisBC: Priorities for future development

In the south and central interior of the province, demand is high for PrognosisBC. And, of course, money and manpower are limited. In which ecosystems should the PrognosisBC development team focus its efforts?

The amount of partial cutting is one factor we are considering to determine priorities for future development. Some of our information may interest you. Recently, we queried the ISIS/MLSIS database to determine the total number of hectares recorded as partially cut by BEC variant in the Cariboo, Kamloops, and Nelson forest regions since January 1, 1988. Partial cutting was defined as commercial thinning, and intermediate, patch, selection and shelter-wood cuts. The top five BEC variants for each forest region are presented in Table 1.

Table 1: Partial cutting by region and BEC variant.

| Region | BEC variant | Partial cutting area (ha) | Region | BEC variant | Partial cutting area (ha) |
|-----------------|-------------|---------------------------|---------------|-------------|---------------------------|
| Cariboo | IDFdk3 | 28,787 | Nelson | IDFdm2 | 12,720 |
| | IDFdk4 | 9,586 | | MSdk | 7,983 |
| | SBSdw2 | 5,694 | | ICHmw2 | 7,586 |
| | SBSdw1 | 2,797 | | IDFdm1 | 6,695 |
| | IDFxm | 1,363 | | ICHmk1 | 4,837 |
| Kamloops | IDFdk1 | 12,169 | | | |
| | ESSFwc2 | 9,271 | | | |
| | IDFdk2 | 8,453 | | | |
| | IDFxh2 | 3,946 | | | |
| | IDFmw1 | 2,796 | | | |

We will use the results from this query—and many other considerations—to plan future development of the PrognosisBC complex stand-growth model.

If you want more information on this, call Barry Snowdon at 250-356-0183.

