What Did You Expect?

by

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Abstract

Weyerhaeuser Canada Ltd. has recently commenced utilization of hardwood species, in addition to traditional softwood consumption, at its Saskatchewan Division operations. Forest management and regeneration problems are not eliminated by virtue of “all-species” harvesting. This paper outlines the company’s experience and approach in the mixedwood region of Saskatchewan.

Résumé

La division de la Saskatchewan de la Weyerhaeuser Ltée a récemment ajouté des essences feuillues aux résineux qu’elle utilise depuis toujours. La récolte de “toutes les essences” n’élimine pas en elle-même les problèmes de régénération et d’aménagement forestier. Le présent article décrit brièvement l’expérience de la compagnie et l’approche utilisée dans la région de forêts mélangées de la Saskatchewan.

Introduction

The mixed wood forest presents problems associated with the harvest of either the conifer or the deciduous component. The problems are not entirely solved by utilizing both components.

The Weyerhaeuser Forest Management Licence area appears to be ideally suited to meet the demands of its current mills — there being a sawmill at Bodmin near Big River, which requires 280 000 to 300 000 m³ annually, and a kraft pulp mill at Prince Albert requiring approximately 1 million m³ of softwood and 620 000 m³ of hardwood. This represents a species split of 67% softwood and 33% hardwood.

The Long Run Sustained Yield for the Core Area (similar to an AAC) is comprised of 1 021 000 m³ of softwood and 722 000 m³ of hardwood, for a total of 1 743 000 m³. Percentage split is 59% softwood and 41% hardwood (Figure 1). Figures 1 and 2 show an apparently attractive supply/demand relationship.

The difficulty soon becomes apparent when we view the present volume of purchased chips and roundwood, most of which is softwood and amounts to some 700 000 m³, arising from outside the lease area (and which is very attractive from a cost perspective), and also when considering that we are currently attempting to encourage an increasing private hardwood purchase program.

The net result, in 1988, is a planned wood production from the lease area as follows:

- Hardwood pulp: 433 000 m³
- Softwood pulp: 265 000 m³
- Softwood logs: 253 000 m³
- Total: 951 000 m³

Again, this can be expressed as 55% softwood and 45% hardwood.

With the available wood supply, it will be evident that the forest cannot be harvested in the proportion in which it occurs without substantially overproducing softwood. In fact, the only way to meet the current timber requirements will be to log virtually only in the hardwood and predominantly hardwood timber types.

More realistically, the utilization of both hardwoods and softwoods from the mixedwood forest offers opportunities in some parts of the area and on some sites but, unless the species balance is in perfect proportion to the long-term mill consumption, selective emphasis in the harvesting, regeneration, and management of designated species will continue.

Management Planning

The commencement of hardwood utilization in conjunction with an expanded sawmill production, has revealed the importance of reliable, accurate, and up-to-date forest inventory information. The previous experience of conservative estimates of volume are not helpful now because we must predict, with
some certainty, the percentage of softwood pulp, hardwood, and softwood logs that will come from a given harvest block. Furthermore, current exploration of harvest/growth computer simulation programs, such as the Weyerhaeuser High Yield Forestry Model, demand inventory detail about the projected future forest that were considered a luxury only a few years ago.

I also point out that the historical lack of importance of hardwoods is reflected in the provincial forest inventory sampling and we often find softwood harvest yields more in line with the inventory than hardwood yields. New and intensified sampling is required in many aspen-dominant and mixedwood types.

**Utilization**

The merchantability limits for the hardwood species differ only as a result of the branching habit of aspen. Top diameter is determined by the point at which crown branches begin, rather than by some agreed-upon standard as with softwoods. Stand utilization is more of a problem and varies both with distance from the mill and with current mill demands.

Clearcutting of all mixedwood stands is just not possible. This would result in cutting too much hardwood at the outer extremities of the lease during sawlog harvesting and a corres-

ponding need to bypass hardwood or mixedwood stands close to the pulp mill. The more realistic option is to clearcut stands closer to the mill until a substantial proportion of total wood requirements have been met, and then begin selective logging for the remaining volume. The difficult questions remain as to when the residual stands can be scheduled for harvest and what is the acceptable delay in regeneration treatments.

**Reforestation**

Most of the industry, our chief experience is with regenerating softwoods and, to some degree, suppressing "competition" — the hardwoods. We have had to refocus on the hardwood resource, and this is not easy. The objective of the future is not merely to "allow" hardwood regeneration to occur, which we all believe will happen naturally if we just ignore harvested areas entirely, but to encourage and cultivate hardwoods with the same intensity as we do softwoods.

Do we not all believe that the same type of management techniques that generate higher quality and growth in conifers can be applied to the hardwoods? Believe me, this is not a trivial psychological obstacle to overcome.

In Saskatchewan, a number of different approaches are underway:

1) First we looked at the occurrence and performance of both hardwoods and softwoods on currently regenerating cutovers. Former regeneration surveys focussed only on the softwoods and occasionally noted "competition" on the tally sheets. Now, all species are tallied and some interesting information is coming to light. Some sites, previously considered understocked or marginally-stocked, can now be called adequately stocked when the hardwoods are counted. In fact, some of the previously recorded NSR has magically disappeared.

On the negative side, however, we are realizing that the vegetation called "competition" in the past is often a mixture of trembling aspen, black poplar, willow, alder, birch, and dogwood. This is the first inkling that perhaps desirable hardwood regeneration is not free after all.

2) Next, the regeneration survey results for hardwoods were linked to certain silviculture treatments. We found that the use of a Marden Drum Chopper led to different results under different conditions.

In one instance, the chopper was used to destroy young hardwood suckering before establishing a white spruce plantation — the prescription in that case. At the time, the need for a follow-up herbicide treatment at age 4 or 5 was acknowledged since a positive response to the site disturbance was expected. To our surprise, only scattered alder and grass recovered. In other situations, however, the more commonly expected response occurred. Rapid and profuse hardwood regeneration followed drum-chopping. The crushing of logging debris, disturbance to root systems, and subsequent raising of soil temperatures promoted hardwood regeneration. Both of these treatments preceded softwood plantation establishment but affected hardwood regeneration differently.

Another treatment involved the use of a Bracke Cultivator. In this instance, the treatment was carried out in the second growing season following harvest of a pure aspen stand. The patch scarifying action of the cultivator disrupted naturally-occurring aspen root sprouts, such that there was regeneration.
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between the scalps but not in them. This is unlike the response on softwood cutovers where regeneration occurs in and around the mineral-soil scalp. Aspen sprouts, measured at age five, totalled 19,000 per hectare on the control site and 14,000 per hectare on the scarified site. Again, there is obvious influence by the silvicultural treatment. Is it significant? Is it beneficial?

We have now initiated studies to determine what are the influencing factors — time of year of cutting, time of year of treatment, type of treatment, age of previous stand, and so forth. We want to understand how and why hardwood regeneration responds as it does and to use this understanding to improve both our hardwood and softwood regeneration treatments. Projects involving new site preparation tools, such as the Donaren, TTS, and Waddell scarifiers (supported by the Canadian Forestry Service [CFS] through the Forest Research Development Agreement), thinning projects comprising part of the growth and field program, and other special studies of our own and CFS origin will all assist.

3) Tree improvement work began at Prince Albert 12 years ago with the establishment of a jack pine seed orchard. A white spruce seed orchard followed in 1981. Last year, we began experiments in rooting trembling aspen from cuttings to develop some background in methodology while other field investigations continued to confirm the adequacy of regeneration on aspen cutovers. Trembling aspen is known to be difficult to root from cuttings so a variety of approaches, including misting in the greenhouse, growth hormones, and different ages of cuttings, were undertaken. If, as we expect, complete and adequate natural regeneration of aspen is not guaranteed, the groundwork will have been laid for an artificial, mass propagation program.

At the same time, a variety of prairie region hybrids, mostly cottonwoods, were outplanted to assess performance against native populations. Pulping trials using poplar hybrids do not usually reveal any superiority of fibre or sheet characteristics over the native aspen and poplar. Nonetheless, limited trials of these hybrids will continue, perhaps with more applicability for use on private land.

Other Resource Users

The closer utilization of all species on the forest land base has intensified competition for land use. In timber stands once left uncut and therefore available for wildlife habitat or for recreation in the form of snowmobile and X-country ski trails, all of the productive forest land is now being scheduled for some form of harvesting. Our response to this reality is to step up our involvement with these other resource users to attempt, through better communications, to prevent conflicts from arising. Wildlife studies have also been initiated to increase understanding of the interaction of harvesting and game populations.

Policy/Regulation

Because hardwoods regenerate and grow more rapidly, limitations on cutover size are not as stringent as for softwoods. The present limit is 130 hectares (300 acres), compared with 40 hectares (100 acres) for softwoods. Aside from this size constraint, no special provisions or requirements exist in the Forest Act or Regulations.

Within the Company we believe there is a desirable balance between what the forest sites can potentially produce, what the species themselves are capable of, and what level of economic input or effort is justifiable. We have not yet determined that balance, but expect to soon.

Soils/Ecology/Geography

In our case, most of the mixedwood belt lies in the southern half of the Weyerhaeuser lease area. The move towards hardwood utilization has not occurred as an expansion of mill output but rather as replacement for softwood production. The net result is that harvesting can be confined to areas closer to the mill — a very desirable situation — and the softwood timber surplus arising from expanded hardwood usage now exists in the lease's distant extremities. This reduced operating radius has great potential to encourage "prime site management" and increase silviculture expenditures on both hardwood and softwood areas.

Conclusion

The important thing to remember is that the utilization of both softwood and hardwood species should not be perceived as merely a new-found use for the "junk", but a legitimate reorientation of the marketplace that now places our hardwood resource in a position of value equal to, and in some cases exceeding, that of the softwood species. We foresters are used to speaking of intensive forestry where the timber values are highest. Consider, now, that this aspen timber may be our country's ultimate salvation as a forest resource.