Aspen — The Ugly Duckling

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Abstract

The aspen resource of Canada is large and increasing. However, aspen has been long neglected by industry because of the abundance of more desirable species — especially spruce. The management of aspen is relatively easy and inexpensive when compared with the dominant softwood species and aspen growth rates are generally superior. Aspen is useable for a wide variety of products. It should be actively promoted and managed.

Résumé

Le tremble forme une part importante et toujours croissante de la ressource forestière au Canada. Pourtant l'industrie forestière l'a longtemps délaissé, à cause de l'abondance d'essences plus précieuses, en particulier les épinettes. Or, le tremble peut être aménagé assez facilement à peu de frais, si on le compare aux essences résineuses, son taux de croissance dépasse habituellement le leur, et il se prête à de nombreuses utilisations. On devrait donc favoriser son aménagement.

There has been much discussion amongst foresters in Canada in recent times about the need for intensive management of Canada's forest resources. The hue and cry is not new; many advocates of intensive forestry practises have spoken up from time to time over the last 70 years. However, this author senses that the comments being expressed by foresters from government agencies, industry, the universities and some from outside of Canada (Steenberg 1976) are being taken much more seriously by the forestry profession and the public, including government. There seems to be a firming of resolve to do something to maintain or even improve Canada's position as the world's most important exporter of forest products. The important question is no longer whether or not to do something, but *what* to do. It seems to the author that it must boil down to various attempts to maximize production of useable wood fibre on a per hectare basis while keeping the costs of growing this wood within reasonable limits. A part of the answer to this question must certainly be the conscious decision of foresters to more actively manage the aspen resources of Canada.

The Resource

Trembling aspen (*Populus tremuloides* Michx.), the major populus species, occurs all across Canada. It was a minor component in the relatively untouched forests of the past. Its incidence was directly related to the frequency of disturbances, primarily fires.

Aspen's ability to reproduce vegetatively by root suckering makes it especially successful following either natural catastrophes, such as fire, or timber harvesting by clearcutting. In both cases, all or most of the overstory is removed allowing light and heat to reach the forest floor. Under these conditions, aspen suckers are produced from the old root system in great abundance. Most become established within one year after the overstory is removed and they generally grow very vigorously because of the preformed, extensive root system.

Extensive harvesting in the Boreal forests has resulted in a significant increase in the abundance of aspen. In 1968, aspen was estimated to comprise approximately 8% of the total Canadian forest resource (Anonymous 1969). This significant proportion is likely to increase further as harvesting continues.

The Ugly Duckling

Despite the large size of the aspen resource in Canada, it has been a neglected and despised species. With few exceptions, the forest industry has regarded aspen largely as a weed species because of the high incidence of rot in standing trees (many of which are overmature) low fibre yields in pulping operations, relatively low strength, and problems with drying and machining lumber (Basham and Navratil 1975). With adequate supplies of spruce and pine available, industry chooses to by-pass aspen stands and leave behind the aspen component of mixed stands in high grading expeditions that produce "silvicultural slums". Only in the past five years has any significant trend towards increased utilization of aspen become apparent. One example is the increased use of aspen for chipboard.

The Potential

Aspen may not have all the desirable features of spruce for newsprint production or pine for lumber production, but it is a useable and adequate species for many uses. Available technology can manufacture newsprint with up to 70% aspen content which is competitive in all respects to newsprints currently produced in eastern Canada and the U.S. (Hatton 1974). Limited testing indicates that trembling aspen may be comparable to spruce-pine-fir in stiffness as well as bending (Kennedy 1974). Lumber grade recovery

from aspen sawlogs was found to be comparable to softwood species (Bailey 1974). Furthermore, kiln drying of aspen lumber and studs can be accomplished successfully, despite a poor reputation in this respect (MacKay 1974, Robinson 1975a). Aspen has proven its suitability for particleboard, pallets and plywood as well. Technology and ingenuity have solved the problems of converting aspen into a multitude of products.

Aspen has several well recognized attributes: it produces abundant root suckers the first growing season after cutting the parent trees; the regenerated stands need a minimal level of silvicultural treatment; and growth rates are generally excellent. For example, the total gross volume production at 70 years on site class II in Ontario is 186, 302 and 427 m³/ha, respectively, for black spruce (*Picea mariana* (Mill.) B.S.P.), jack pine (*Pinus banksiana* Lamb.) and aspen (Plonski 1974). Complete clearcuts in aspen stands or mixed stands will result in an abundance of suckers. Incomplete clearcuttings, old cutovers with scattered residual aspen, and mixed stands with less than 10% aspen may require site preparation (e.g., prescribed burning or disk-ing) to maximize suckering and minimize competition. The costs in the latter case are only a fraction of the cost of converting hardwood stands or mixed stands to preferred softwood species. The problems inherent in softwood management are largely absent in aspen management. There is no time lag in stand re-establishment; no planting or seeding costs; and thinning are not necessary since aspen thins itself.

Some Problems

Aspen management isn't entirely a bed of roses. There are some distinct problems — particularly diseases. One of the reasons aspen is considered an undesirable species is that older stands have a high incidence of heart rot — mostly caused by *Fomes igniarius*. However, serious decay in overmature stands does not appear to affect new suckers (Brinkman and Rose 1975) and second growth stands do not have an increased incidence of decay (Kemperman 1976). If stands are harvested before reaching 80 years, high losses from decay can usually be avoided (Basham and Morowski 1964). Hypoxylon canker (*Hypoxylon mammatum* (Wahl.) Miller) sometimes causes serious losses, but these losses can be minimized by maintaining high levels of stocking and avoiding poor aspen sites (Maini and Cayford 1968; Brinkman and Roe 1975).

Most attempts to promote aspen management in the past, even on an experimental basis, have failed — primarily because of a lack of support at the field forester level (Robinson 1975b). The reasons for this are undoubtedly varied, but industry's negative viewpoint was probably a pervasive factor. Aspen management will never become a reality until government and industry field foresters are convinced it is sound forestry and economically desirable.

Conclusions

Today's forest managers should actively manage aspen stands to produce aspen for the next harvest. Only poor aspen sites should be considered for conversion to softwoods. This will result in the prompt re-establishment of stands which will grow rapidly and be self-thinning. The mature stands, at age 50-80 years, depending on site quality, will have acceptable amounts of defect and be entirely acceptable to the forest industry for a multitude of end products. It is time to focus on the positive aspects of aspen management in Canada. Field level foresters must lead the way.

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