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Laflamme, G. 1978. Discoloured wood of aspen caused by increment boring. *European Journal of Forest Pathology* 9(1): 15-18.

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Discoloured wood of aspen caused by increment boring

By G. LAFLAMME

Receipt of Ms. 6. 4. 1978

Abstract

Decay resulting from increment borings varies with tree species. Trembling aspen (*Populus tremuloides* Michx.) in Newfoundland is seriously affected by this particular wound. Three years after 20 trees had been bored, none had healed probably because of a pronounced split of the bark. The wood discoloration extended horizontally to about 2 cm on each side and vertically half metre above and below the wound. *Peniophora polygonia* (Pers. ex Fr.) Bourd. et Galz. was the most common fungus isolated while *Polyporus adustus* Willd. ex Fr. and several imperfect fungi and bacteria were also present.

Introduction

The effects of increment boring on wood quality have long been studied in Germany and the United States, and a literature review on this subject was published by JAEGER (1970). Hardwood species seem more susceptible than softwoods to discoloration and decay after boring (HEPTING et al. 1949) but SCHÖPFER (1961) reported that in Germany European silver fir and Norway spruce had extensive heart rot while Scots pine was affected very little. Diffuse-porous hardwoods are said to be more subject to decay than ring-porous hardwoods (JAEGER 1970), however TOOLE et al. (1959) found a highly significant difference in stain and decay among five hardwoods including both diffuse and ring porous species. It appears from the above reports that the extent of discoloration and decay in wood varies from species to species and that some groups of species have the tendency to react similarly. As no study of increment boring damage on trembling aspen (*Populus tremuloides* Michx.) is known to us, our observations of such damage to this species are presented here.

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Eur. J. For. Path. 9 (1979) 15-18
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ISSN 0300-1237/ASTM-Coden: EJFPA 9

Methods

In a decay study of aspen particular attention was given to the increment boring wounds encountered. A total of 20 trees with such wounds were dissected. Their DBH¹ varied from 14 to 29 cm. These trees were among 400 aspen bored in a study on growth throughout north-central Newfoundland (PAGE 1972). Most of these stands were in the Boreal Forest Region B. 28a (ROWE 1959). The 5 mm diameter borings were made at the DBH in late May and June. Fifteen of the 20 trees studied had more than one hole; but in these cases, the increment cores were taken more or less in one line parallel to the centre of the tree. This was done in search of an increment core going right to the pith. The trees were cut and dissected after three growing seasons and cultures were made from 17 of the trees.

Results and discussion

After three years, none of the holes observed were healed. The invasion of wounds by *Nectria* canker was partly responsible for the slow rate of wound healing found in the southern Appalachians (HEFFING et al. 1949) but no evidence of this disease was observed in this aspen study. A split of the bark above and below each hole may have delayed healing. The wounded bark heals close to the holes horizontally but vertically the split of the bark averaged 10 cm in length (Table). The damage was much more pronounced on trees with several holes because the splits joined from one hole to another and averaged 27 cm in length.

Table 1

Data collected on aspen trees in Newfoundland three growing seasons after increment boring

Number of trees	Number of borings per tree	Vertical length of split bark (cm)		Horizontal width of discoloration (cm)		Vertical length of discoloration (cm)	
		Average	Range	Average	Range	Average	Range
5	1	10	2.3 – 21.3	3	2.0 – 4.1	105.4	50 – 187
15	2 to 7	27.2	7.1 – 44.5	3.8	2.3 – 6.6	114.4	66 – 167

In cross-sections the column of discoloured wood in each tree was more or less rectangular (Figure). The longer side was at least equal to the length of the core, and the shorter side varied from 2 to 4 cm, or a little more in trees with more than one hole. The variation in the direction of the core inside the trunk caused this latter increase. The length of the discoloured wood extended about the same distance above the holes as below and averaged 105 cm for trees with one wound and 114 cm for trees with more than one. The difference is due to the longer splits of the bark in the second case. The extent of discoloured wood in aspen due to boring is one of the most extensive recorded in bored hardwood and is comparable to the defects caused in yellow and white birches in the United States (CAMPBELL 1939; LORENZ 1944).

Bacteria and imperfect fungi were present in the 17 samples. *Libertella* sp. and *Ascocoryne sarcoides* (Jacq. ex Gray) Groves and Wilson were both isolated from discoloured wood but not frequently. *Peniophora polygonia* (Pers. ex Fr.) Bourd. and Galz. was isolated from 13 out of the 17 samples. This fungus is known to be common in discoloured wood aspen

¹ Diameter at breast height.

Fig. 1. Sections through the hole made by increment boring in trembling aspen

(BASHAM et al. 1964; LAFLAMME et al. 1973). *Polyporus adustus* Willd. ex Fr. was isolated from 5 samples but 4 samples were from the same plot. The type of microorganisms isolated indicate that the incipient decay was still at an early stage.

It is evident from this study that trembling aspen is very susceptible to discolouration and decay through wounds caused by increment boring. This high susceptibility is probably due in part to the lack of healing of such wounds. Efforts should be made to use the least possible number of increment borings in a stand to minimize the occurrence of decay in trembling aspen.

Résumé

La carie résultant de l'usage de la tarière de Pressler varie selon les espèces d'arbres. Le tremble (*Populus tremuloides* Michx.) de Terre-Neuve est sérieusement affecté par ce type de blessure. L'examen de 20 arbres, trois ans après qu'ils furent sondés à l'aide de cet instrument, ne montre aucune cicatrisation complète de l'écorce à cause d'un long fendillement. La coloration du bois s'étendait horizontalement à environ 2 cm de chaque côté de la blessure, et verticalement à un demi mètre au-dessus et au-dessous de celle-ci. *Peniophora polygonia* (Pers. ex Fr.) Bourd. et Galz. fut le champignon le plus fréquemment isolé; des champignons imparfaits et des bactéries étaient nombreux et *Polyporus adustus* Willd. ex Fr. occasionnel.

Zusammenfassung

Holzverfärbung bei Aspen, verursacht durch Zuwachsbohrungen

Die durch Zuwachsbohrer verursachte Fäule variiert je nach Baumart. Die Neufundlandpappel (*Populus tremuloides* Michx.) wird durch derartige Wunden stark beschädigt. Keine vollständige Heilung konnte bei 20 Bäumen festgestellt werden, die vor 3 Jahren mittels dieser Sonde untersucht wurden; die Rinde zeigte immer noch einen langen Riß. Die Holzverfärbung hatte sich horizontal um etwa 2 cm auf jeder Seite und vertikal um ca. 50 cm oberhalb und unterhalb der Wunde ausgebreitet. *Peniophora polygonia* (Pers. ex Fr.) Bourd. et Galz. wurde am meisten, Deuteromycetes und Bakterien sehr häufig und *Polyporus adustus* Willd. ex Fr. gelegentlich isoliert.

References

- BASHAM, J. T.; MORAWSKI, Z. J. R., 1964: Cull studies. The Defects and Associated Basidiomycete Fungi in the Heartwood of Living Trees in the Forests of Ontario. Publ. No. 1072. Dept. Forestry, Ottawa, Canada.
- CAMPBELL, W. A., 1939: Damage from increment borings. In: JAEGER, T. A., 1970. Div. Forest Pathol. Bur. Plant Ind. U. S. Dep. Agr. Mimco.
- HEPTING, G. A.; ROTH, E. R.; SLEETH, B., 1949: Discoloration and decay from increment borings. J. Forest. 47, 366–370.
- JAEGER, T. A., 1970: Increment borer damage and its control: A review of the literature. Publ. No. 1270, Can. Forestry Service, Dept. Fish. and For.
- LAFLAMME, G.; LORTIE, M., 1973: Micro-organismes dans les tissus colorés et cariés du peuplier faux-tremble. Can. J. Forest Res. 3, 155–160.
- LORENZ, R. C., 1944: Discolorations and decay resulting from increment borings in hardwoods. J. Forest. 42, 37–43.
- PAGE, G. 1972: The occurrence and growth of trembling aspen in Newfoundland. Publ. No. 1314, Can. Forestry Service, Dept. Environment.
- ROWE, J. S., 1959: Forest regions of Canada. Bull. 123. For. Branch, Dept. Northern Affairs and Nat. Resources.
- SCHÖPFER, W., 1961: Die Bohrspanentnahme von Waldbäumen. In: JAEGER, T. A., 1970. Allg. Forstzeitschr. 16, 297–300, 345–347.
- TOOLE, E. R.; GAMMAGE, J. L., 1959: Damage from increment borings in bottomland hardwoods. J. Forest. 57, 909–911.

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