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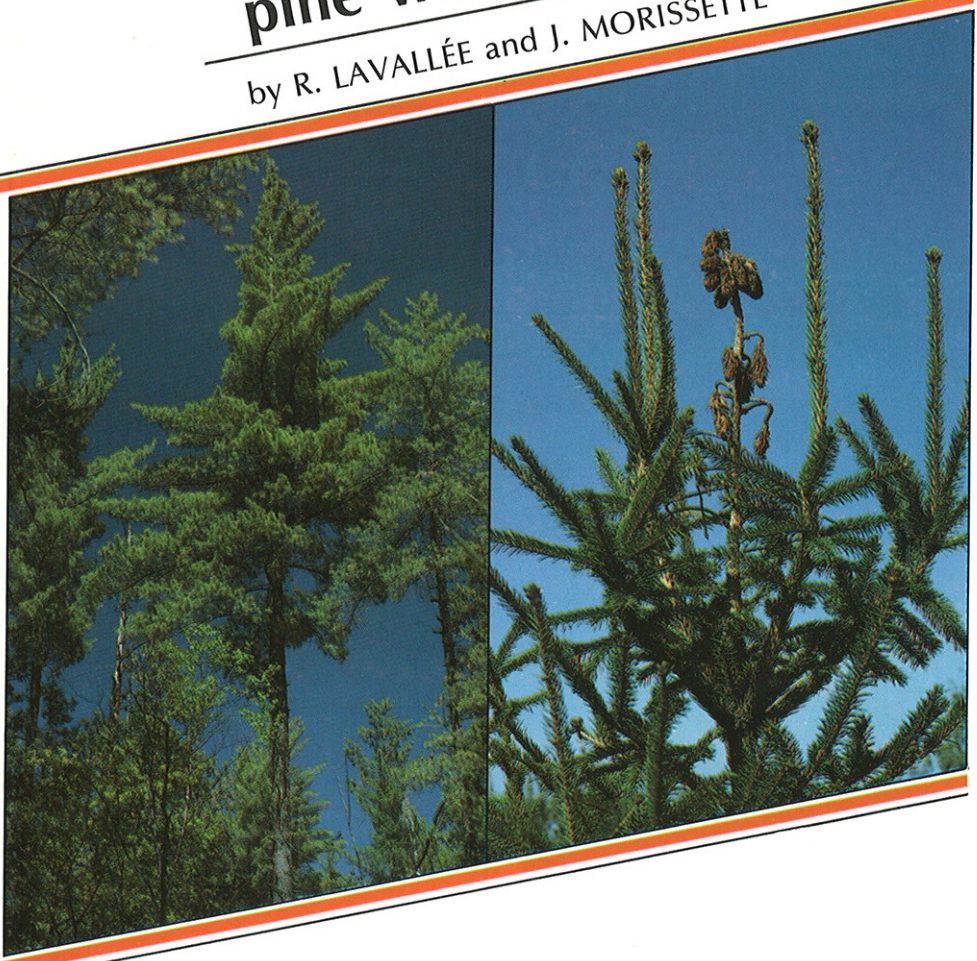
INFORMATION LEAFLET

Mechanical control of the white pine weevil

by R. LAVALLÉE and J. MORISSETTE



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Cover: Mature white pine and young Norway spruce attacked by the white pine weevil

(Photos: J. Morissette)

The white pine weevil, Pissodes strobi [*Peck*], *(Fig. 1) is a serious impediment to the growth of a number of conifers and, in particular, eastern white pine,* Pinus strobus *L., and Norway spruce,* Picea abies *(L.) Karst, (Fig. 2). While it occurs naturally in our forests, the weevil causes greater damage in plantations. The consequences for wood producers, in particular of sawlogs, are especially costly. Despite the extent of natural biological control (Fig. 3), this insect sometimes attains very high population levels. This leaflet is intended to enable foresters to take prompt and appropriate action in plantations where weevil infestations are in their initial stages.*

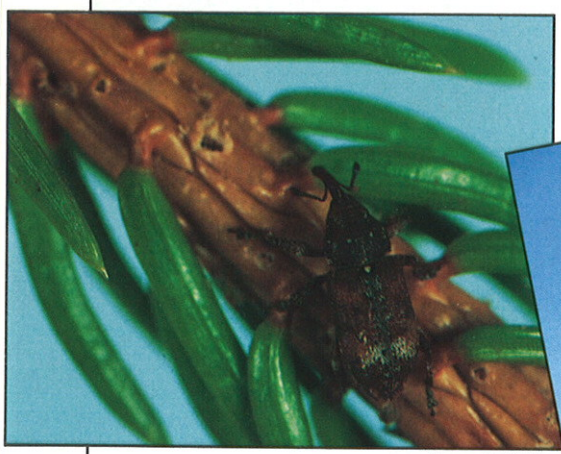

Photo: C. Moffet

Figure 1. Adult white pine weevil.

Photo: R. Lavallée

Figure 2. Weevil-infested Norway spruce.

Photo: C. Moffet

Photo: T. Arcand

Figures 3 and 3.1. Predator fly larvae.

Why use mechanical control?

Among weevil control methods, removal of the infested terminal shoot is still the simplest and most effective strategy, especially in young plantations. Since the weevil spends the larval stage under the bark of the shoot, collection of terminal shoots completely eliminates the new generation. Moreover, the weevil flies relatively little. An attack in a plantation is initially localized and, in the first years, spreads fairly slowly from the original infestation site.

Infestation symptoms

Weevil activity starts early in the spring, around the end of April or the beginning of May. The adult insect, which spends the winter in the litter under a host tree, returns to the terminal shoot to feed and mate (Fig. 4). Damage

Photo: C. Moffet

Figure 4. Mating weevils.

Photo: T. Arcand

Figure 5. Feeding punctures.

caused by the adult is minor and limited to small feeding punctures (Fig. 5).

Resin droplets that exude from the punctures glisten in the sun indicating the presence of the insect (Fig. 6). During more than six weeks starting in early May, the females lay their eggs mainly in the upper part of the terminal shoot. An attentive observer will be able to detect the laying holes, which appear as

Photo: C. Moffet

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Figures 6 and 6.1. Resin flow from feeding punctures.

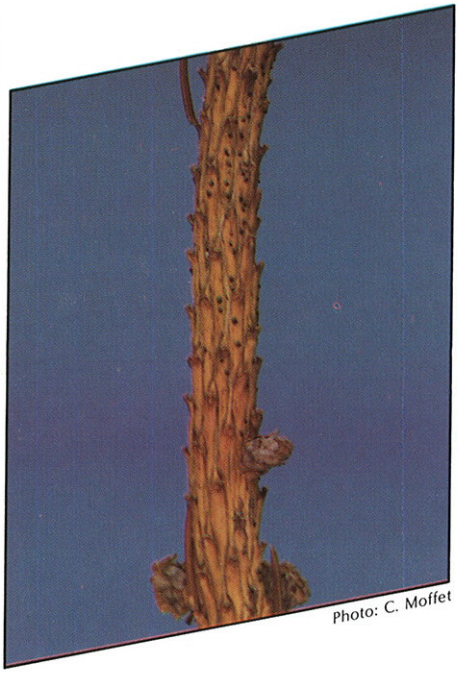


Photo: C. Moffet

Photo: R. Lavallée

Figures 7 and 7.1. Laying holes.

tiny black dots (Fig. 7). Under each dot, the female will have laid one to three eggs (Fig. 8). A single female may lay 100 eggs on one or several shoots.

After ten days or so, the first eggs hatch and the young larvae feed on the bark tissue. As the larvae grow, they gradually disrupt the flow of sap. When this happens, the current-year terminal shoot stops growing and wilts (Figs. 9 and 10).

Photo: C. Moffet

Figure 8. White pine weevil eggs.

Photo: R. Lavallée

Figure 9. Arrested growth in a terminal shoot.

Photo: J. Morissette

Photo: Lina Breton, MER

Figures 10 and 10.1. Wilting of a terminal shoot.

Pruning of infested terminal shoots

Photo: C. Moffet

Photo: T. Arcand

Figures 11 and 11.1. Larvae under bark of a shoot.

Generally, infestation symptoms begin to appear during the first weeks of July. This is the time to undertake mechanical control efforts — the weevils, still in the larval stage, are all located under the bark (Fig. 11). Pruning and destruction of the infested terminal shoot will eliminate entire broods. When the larvae are very numerous, however, they may descend into the previous year's shoot. It is therefore important to ensure after pruning that no larvae remain under the bark. When the insect has moved farther down (Fig. 12), the bark will appear brownish at the cut location. These previous year shoots must also be collected and destroyed (Fig. 13). It is futile to prune too late in the season after adult emergence, which is indicated by circular holes in

Photo: R. Lavallée

Figure 12. Cross section of infested and healthy shoots.

the shoot (Fig. 14). All infested shoots must be destroyed. Leaving them at the site would nullify this method of control, since the larvae would continue to develop and emerge as adults.

The infested shoot should be pruned in such a way as to favor rapid growth of a new terminal shoot. The top of the stem is cut back to a shoot that is to replace it. It is necessary to choose the lateral that will become the new terminal shoot. Removal of the other shoots at the same whorl will limit competition between them and accelerate straightening of the new terminal (Fig. 15). Inspection of the treated trees the following year will provide an opportunity to correct growth anomalies.

Host species become susceptible to weevil attacks between the age of five to eight years. It is during these years they must be inspected. Checking for damage every two years should be sufficient. However, if weevil attacks have already been reported in the reforesta-

Photo: Lina Breton, MER

Figure 13. Collecting infested terminal shoots.

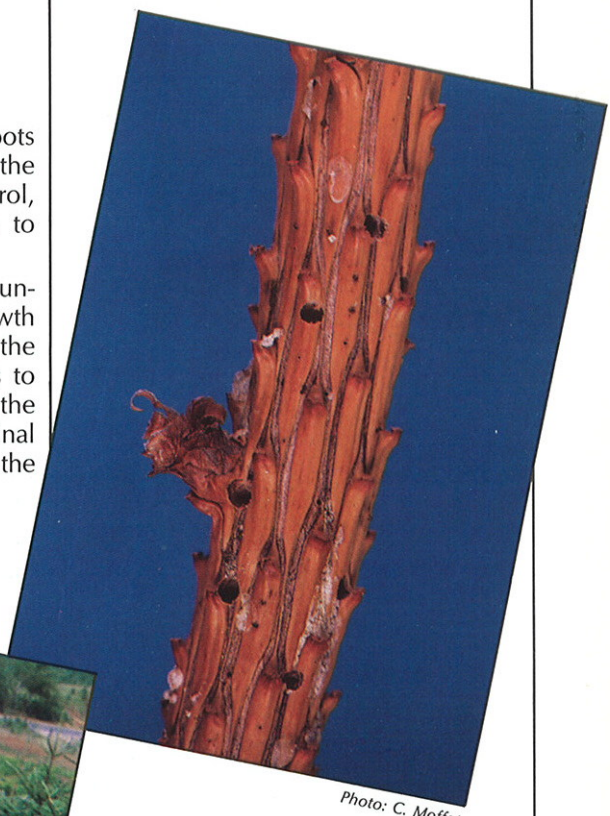


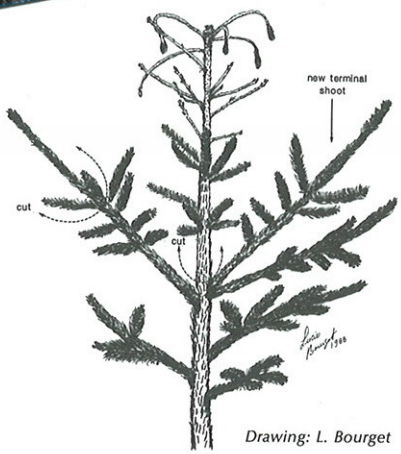
Photo: C. Moffet

Figure 14. Holes left by emerging adults.

Photo: C. Moffet

Photo: C. Moffet

Figures 15, 15.1, 15.2. Pruning of an infested terminal shoot and selection of a new terminal shoot.



Drawing: L. Bourget

tion area, annual inspections are more appropriate. It is important to remember that failure to act will lead to more serious damage the following year. Naturally, mechanical control efforts will become more difficult as the trees grow. On the other hand, keeping weevil populations down to the lowest possible level in the initial years will minimize later treatments in the plantation (Fig. 16) and should yield at least one sawlog per tree suitable for quality lumber production.

Figure 16. Weevil-free Norway spruce plantation.

Photo: J. Morissette

Design concept: Lucil LePage

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