THE WESTERN ASH BARK BEETLE

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From: Forest Insects and Diseases April 1989

Green ash, **Fraxinus pennsylvanica** var. **subintegerrima** (Vahl) Fern., is a highly prized shade tree planted in urban and rural environments of the Great Plains of the United States and prairie provinces of Canada. Green ash has been preferentially planted over other popular shade tree species in many (especially urban) areas because it is hardy, easy to maintain, and has fewer diseases and insect pests than other trees. One insect that is commonly associated with green ash and other **Fraxinus** species is the western ash bark beetle (WABB), **Hylesinus (-Leperisinus) californicus** (Swaine). In Canada the WABB occurs in the southern half of the prairie provinces, British Columbia, and likely in western Ontario. In the United States the species is widespread in the Great Plains and Rocky Mountain Region, south to northern Mexico. The WABB is also a significant pest of olive trees in California.

Larvae of the WABB are 2-4 mm long, white, legless grubs with brown head capsules. Adults are robust, oval, 2-3 mm long and have a variegated white and brown color. Good photographs of the adults, larvae and egg galleries are provided in Ives and Wong (1987).

The biology of the WABB is poorly understood. Published information on this pest indicates that its life cycle varies greatly over its geographic range. In Canada, the ecology of the WABB has not been studied but scattered observations on its life history have been made by several researchers. The species overwinters as adults in the bark of the lower 30 cm of the bole and in exposed roots of ash. The beetles emerge from overwintering sites in late April and early May and disperse to twigs and branches where they feed on phloem tissue for a brief period before breeding. The female initiates an attack and attracts a mate by producing an aggregation pheromone (sex attractant). After mating, the female begins to construct a transverse egg gallery in the phloem. Eggs are laid in small pockets along both sides of the gallery and upon hatching, the larvae feed in a direction perpendicular to the gallery. Development is completed in late July and August and new adults emerge from their galleries to feed for a while in the crotches of branches before moving to overwintering sites in September and October. Beetles appear to walk or fall to the base of the tree instead of flying. It is not known if all beetles overwinter at the tree base.

The WABB usually infests only the occasional weakened tree or branch and causes relatively little damage. However, when large numbers of trees are stressed (commonly by drought or ice storms) they become susceptible to WABB attack. With the sudden availability of weakened host material, WABB populations quickly increase to outbreak levels causing economically significant damage. Localized and widespread droughts have become more common in the North American midwest in recent years due to changes in weather patterns and have likely contributed to the increase in WABB outbreaks. In the past five years, WABB outbreaks have occurred in most major urban centers and in many rural areas in the southern half of the prairie provinces. WABB populations are currently at outbreak levels in southern Alberta and in Montana. In 1988, 30-35% of the approximately 90 000 green ash in Calgary were attacked by the WABB and about 5% were killed.

A tree undergoing attack by the WABB can be identified by the presence of tiny holes (about 2 mm diameter) in the bark, especially in cracks and crevices, and accumulations of boring dust under the attack sites. The transverse egg galleries are evident by the sunken, discolored bark and a row of 'ventilation holes' about 4-6 mm apart along the length of the gallery. The leaves of branches girdled by egg gallery construction turn yellow by late June or early July, thus flagging infested branches.

Since WABB populations build up in weakened host material, steps can be taken to minimize the availability of such breeding material. Dead, weakened and criss-crossing branches should be pruned from trees in early spring. Infested branches and trees as well as old weakened trees should be removed and disposed of (by burning or burying) before adult emergence in July.

No insecticides are currently registered for control of WABB. However, carbaryl, methoxychlor and chlorpyrifos have been used with some success at controlling this insect in the past. Spraying of boles and larger branches in the spring kills adult beetles that are starting to feed or attack, thus protecting trees. Spraying the lower metre of bole in late summer targets beetles attempting to enter the bole to overwinter.

Little research on this insect has been done in Canada or the United States. This general lack of biological information on the WABB requires an intensive research program to learn the life history (phenology, behavior, life tables, etc.) and population dynamics. As well, there is a need to evaluate control strategies and implement effective population monitoring and management programs. Pheromones have proved very promising for monitoring and control of other bark beetles. Currently, personnel at NoFC are functioning in an advisory capacity for some preliminary research on the WABB currently being conducted by the Calgary Department of Parks and Recreation. This research will focus on determining the life cycle of the beetle in Calgary and will form the groundwork for any future research on this pest.

Further reading:

Ives, W.G.H. and H.R. Wong. 1988. Tree and shrub insects of the prairie provinces. Can. For. Serv., Northern For. Cent., Edmonton, Alberta. Info. Rep. NOR-X-292.

McKnight, M.E. and D.G. Aarhus. 1973. Bark beetles, Leperisinus californicus and L. criddlei (Coleoptera: Scolytidae), attacking green ash in North Dakota. Annals of the Entomological Society of America 66:955-957.

PUBLISHED BY:
Landscape Alberta Nursery Trades Association
PUBLISHER:
Garry Johnson
Executive Director
Landscape Alberta
Nursery Trades Association
EDITOR:
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PRINTED BY:
Lithocraft Inc.
Edmonton, Alberta

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ISSN 0820-6848

SECOND CLASS MAIL REGISTRATION:
#4912 - 1 July, 1989
Prairie Landscape Magazine is the bi-monthly trade magazine of the nursery trades associations of Alberta, Saskatchewan and Manitoba.
Opinions expressed herein are those of the authors and are not representative of opinions of the affiliated or Prairie Landscape Magazine.

INDEX OF ADVERTISERS

PRAIRIE LANDSCAPE MAGAZINE

PUBLISHED BY LANDSCAPE ALBERTA NURSERY TRADES ASSOCIATION

July/August, 1989 vol. 12, no. 4

CONTENTS

EDITOR'S COMMENTS

Annette Gallatin, Editor

Gerald Van Bruggen, Co-Editor

The article "Forest Insect and Disease Conditions in Alberta, Saskatchewan, Manitoba and the Northwest Territories in 1987" makes clear the fact that NOW is the time to press our provincial governments to battle pests like the forest tent caterpillar with bacillus thuringiensis. Our governments spend millions of dollars on much less needed projects. Trees defoliated by tent caterpillars year after year are doomed as they haven't the reserves needed to push two sets of leaves every year. Once our windbreaks and forest areas are gone, so is our topsoil. Act NOW! Contact your MLA and DEMAND that corrective action be taken.

Annette Gallatin,
Editor