

So far, attempts to eradicate DED completely from a given area have not succeeded. It is possible, however, that reduction from the present epidemic level can be attained if concerted action is taken against all of the involved factors. In order to demonstrate integrated DED control in Sault Ste. Marie in 1976, the Great Lakes Forest Research Centre initiated a special project of several years' duration. In addition to controlling the incidence of the disease within the city as rapidly as possible, the program plans to establish a test setting for further research in control methods.

Fire control

Each year about 8 000 fires sweep across more than 2 000 000 ha of Canadian forest land. Losses are estimated at \$65 million a year.

The Canadian Forest Fire Weather Index is a fire-danger rating system that predicts fire occurrence and behaviour in the Canadian forest. Based on temperature, relative humidity, wind-speed and 24-hour rainfall, it has been adopted by all fire control agencies in Canada.

A computerized system has also been developed which assists in daily detection and fire control decision-making. It draws on information related to such matters as forest fuels, thunderstorm paths and historical fire data to aid aerial detection.

Specially designed lightning detectors have been developed as an inexpensive and reliable means of thunderstorm tracking. These sensors, each with a range of about 32 km form a network extending over the major Canadian forested regions. A strong relationship exists between the sensor counts, fuel moisture and the occurrence of fires caused by lightning. With a formula that relates counts and index value to fire starts, it is possible to use the sensors to obtain a reliable estimate of possible lightning fires over an area.

Since the type of forest fuel that a fire burns is important in determining the fire's rate-of-spread and difficulty to control, fuel-type maps for fire control regions have been produced from Landsat satellite data using the Canadian Taylor-enhancement method. A digital data base is also being constructed to assist in initial-attack decision making and fire-growth modelling. This same data base will encompass detection information, such as locations of new roads and logging slash areas, that is important to long-term fire control planning.

Pacific Forest Research Centre researchers are using aerial thermal infra-red scanning technology to detect fires before visible signs such as flames or smoke occur. The British Columbia Ministry of Forests now operates six thermal scanners. They are usually flown by helicopter and are capable of pinpointing a burning cigarette from an altitude of 300 m.



(top) *Native elm bark beetle.*

(bottom) *Water bombers in use against forest fires.*