

carried out through radio, television, newspapers, pamphlets, signs, films and tours.

Saskatchewan has a network of 46 lookout towers and an aircraft patrol during the dry season. During periods of extreme fire hazards, additional detection aircraft are utilized. Helicopters and fixed-wing aircraft capable of water-dropping provide aerial support. There are also land-based aircraft which drop long-term fire retardants and skimmer-type water bombers.

Alberta has a fire detection system consisting of 145 lookout towers supplemented by aircraft patrols. It also operates an automatic lightning detection system and has integrated this system with direction finders in British Columbia and Northwest Territories. Alberta's fire-fighting force consists of several crews equipped with helicopters, land-based airtankers and amphibious airtankers. The airtanker fleet operates from 15 bases, all equipped with long-term fire retardants. Manpower support is available from approximately 6,000 trained fire fighters.

British Columbia has a lightning location network that covers the entire province. It also has lookouts, air patrols, crews capable of descending to inaccessible terrain from a hovering helicopter, airtanker fleets and airtanker bases.

Budworms remain the most damaging forest insect pest in Central and Eastern Canada. While not as severe as in 1980 when 1 380 000 ha (hectares) of the forested area of Nova Scotia were defoliated by spruce budworm, many areas continue to be attacked. In 1985, 345 200 ha were defoliated by the budworm. In Quebec, the amount of forest land infested by spruce budworm has decreased significantly since 1981. In 1986, 2 million hectares were infested, compared with almost 13 million hectares at the peak of the infestation. Some spraying programs and research are continuing to combat this problem.

Three insects represent the greatest threat to Ontario's forest resource: the gypsy moth, the jackpine budworm, and the spruce budworm. In 1986, Ontario undertook its largest protection spray operation against forest insect pests. About 3% of a 16 million hectare infestation area was targeted for protection action, which involved both aerial spraying and salvage cutting. In 1987, the infestation is expected to drop to 10 million hectares because of natural cycles, climatic factors and successful protection programs.

In Newfoundland, there was a decline of the spruce budworm infestation in 1985, but in 1986 there was a severe outbreak of hemlock looper with moderate to severe defoliation on some 215 000 ha mostly on the western part of the island and light defoliation on 117 000 ha.

Pest management is an important aspect of British Columbia's forest protection program. Insects and diseases destroy the equivalent of about a third of the wood harvested in the province each year. They are far more destructive than wildfires. Appropriate responses in pest management include salvaging damaged but valuable trees, sanitation clearing of infected stands, selective thinning and spacing, using biological tools (sex attractants and the pests' own viruses), or applying pesticides.

*Regeneration.* The provinces have taken measures to increase the area of denuded forest land that is reforested. In addition, dependence on natural regeneration alone continues to diminish. Left to nature, approximately one third of cutover forest land fails to regenerate adequately in terms of desired tree species and stocking. Furthermore, present logging methods, such as clear-cutting, have reduced the area on which natural regeneration can be relied upon.

All provinces have increased the funding available for reforestation from their resources and through federal-provincial cost-shared agreements and involved the forest industry in the planning and conduct of much of the reforestation on Crown land. Typically the provinces have assumed responsibility for the provision of nursery stock and reforestation of burned areas and of the backlog of lands that remain insufficiently stocked with tree cover. However, some provinces have encouraged the establishment of private nurseries and seed orchards rather than expanding provincial capacity.

Recently, the emphasis has turned from increasing the size of reforestation programs to ensuring that these investments are cost effective. To this end, many provinces have increased the use of containerized seedling stocks, instituted quality control measures for nursery stock production and tree planting, developed and adopted treatments appropriate for various site types, and initiated the development of genetically improved planting stock.

To improve forest productivity, tree improvement is being pursued by all provincial governments. The provinces with the largest planting programs carry out both research and applied tree improvement programs. The other provinces are primarily engaged in applied tree improvement and rely on the CFS and universities for research information and guidance. Co-operative tree improvement councils have been formed between industry and government in several provinces. As a result, seed collection areas and seed orchards have been established throughout Canada to facilitate the production and collection of superior tree seed for the production of planting stock.