

spread use of clearcutting — the removal of the entire crop in a given area. Increasing utilization of all species accentuates this trend. About 80 per cent of the area logged in Canada today is clearcut.

Heavy machinery, however, may destroy young trees already in the ground, meaning lower productivity in the next crop, or a resort to seeding and planting. If logging takes place when the ground is not frozen or snow-covered, heavy machinery can damage the structure of some soils, and may cause erosion.

Used judiciously, clearcutting can be good forestry practice; used unwisely, it can have calamitous results. When skilfully used, it is far superior to the old practice of "highgrading" a forest repeatedly for its biggest and best trees.

Pests and pesticides

Insects kill about 250,000 acres of mature forest annually in Canada. As the demand for wood grows, the need to control the pests that destroy it becomes urgent. If unchecked, the spruce budworm alone could put many mills out of business in areas where unemployment is already a serious problem.

Though pesticides are still usually the reliable method of control, the environmental dangers in their misuse are well known. Much effort has been devoted to determining their side effects, and these studies still continue. They include investigations of the effects of pesticide spraying on fish, bottom fauna in streams and lakes, birds and mammals, soil micro-organisms and non-harmful insects. Attempts have been made to monitor the accumulation of pesticides in soil and vegetation, and their decomposition and movement through food chains. DDT, which has not been used since 1967, has been replaced by a less persistent class of insecticides.

Alternatives to pesticides include the use of insect viruses, bacteria, parasites and predators, sex attractants and the manipulation of the forest itself. Considerable research is being devoted to these possibilities, as well as to the search for safer pesticides and safer and more effective ways of using them. However, despite recent publicity, and one or two spectacular successes, "biological control" as yet provides no simple alternative to pesticides.

Fertilizers, herbicides and brushkillers Forest fertilization is just beginning to become common as a means of increasing forest growth. Between 5,000 and 15,000 acres are treated annually in Canada, mostly with nitrogen. The fertilizer is usually applied only once, ten to 15 years before the stands are scheduled for logging.

The dosages applied in forestry are generally low compared to those in agriculture. Also, forest soils contain much organic matter and have a thick mat of roots which efficiently prevents nutrient losses. Thus, little fertilizer is likely to escape into stream water and become a source of pollution, although investigations into the possible consequences are in progress in several parts of the country.

Some attention has also been focused on the potential dangers of herbicides and brushkillers in forest use. Despite some public alarm, however, the hazards from those commonly used in North America are minor.

Man-made forests

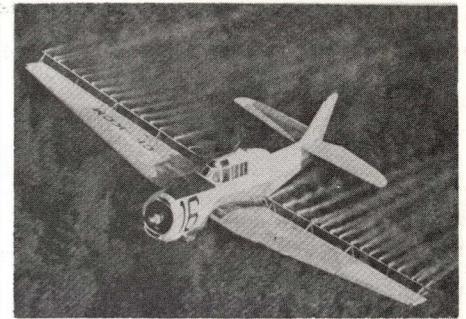
The need for greater forest productivity is leading to greater reliance on direct seeding and planting as a means of restocking forest land. At present, about four million acres have been artificially restocked in Canada. By 1985, the total will be ten million acres.

Other forest influences

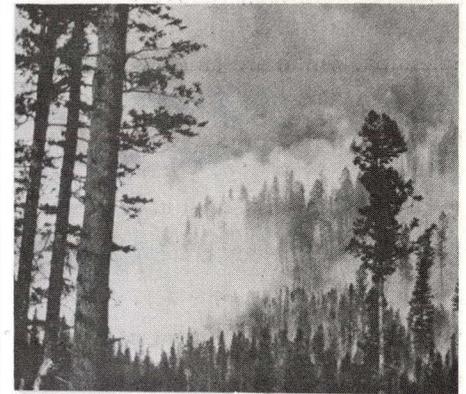
Besides industrial exploitation, other influences can have adverse effects on the forest environment. These include mining and seismic exploration, breaks in oil and gas pipelines, highway construction, urban sprawl, and hydroelectric developments. Insects and diseases introduced from other countries, like Dutch elm disease, larch sawfly and balsam woolly aphid, against which our forests have no built-in defences, have also made serious impacts.

The public itself can have a detrimental effect — as well as creating an immense problem of litter and garbage disposal, people start 75 per cent of all forest fires.

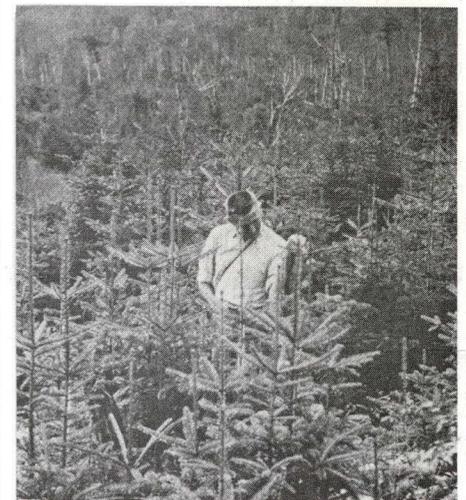
Air pollution also is responsible for serious damage to both agriculture and forest crops. Though there are many air pollutants, in Canada the chief offender is sulphur dioxide, which accounts for a direct loss to forestry of between \$1.2 million and \$2.8 million annually.



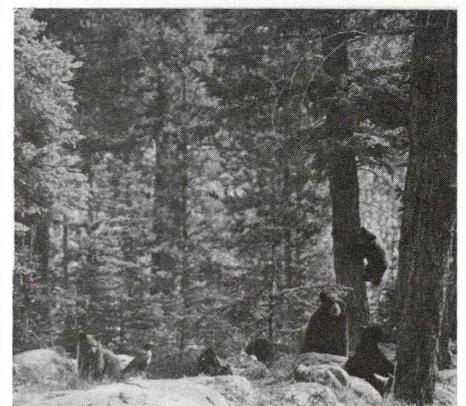
Protection



Wildfire



Regeneration



Endangered wildlife