

Investigations were carried on in evaluation of site features of soil, climate and vegetation as factors affecting forest production and multiple land use. Reforestation procedures were advanced with research into culling and grading of nursery stock, root pruning, comparative studies of seedlings versus transplants, and specialized planting techniques. Experiments in tree breeding and genetics have shown that some hybrids between Himalayan and native white pine are standing up very well under repeated infection with blister rust, Ontario's major tree disease. Portions of seeds from the Chapleau area were irradiated with increasing doses of X-ray at the Atomic Energy of Canada Limited laboratories as part of a long-term project to determine whether irradiation will induce mutations of white pine resistant to blister rust.

During 1960, 20,157 sq. miles of the province were surveyed by air as part of the program to re-photograph the present exploitable forest area before 1967.

Manitoba.—The forests of Manitoba are administered by the Forest Service, a Branch of the Department of Mines and Natural Resources. The Service is headed by a Provincial Forester and the province is divided into four Forest Districts—Northern, Southern, Eastern and Western—each with a District Forester in charge. The Whiteshell Forest Reserve, which is an important recreational area, is also supervised by a Forester. Each Forest District is subdivided into Forest Ranger Districts of which there are 40, each in charge of a Forest Ranger.

The cutting of mature timber is governed by timber sale, licensed timber berth, pulpwood lease, or timber permit. Timber sales are disposed of by public auction and cover periods of from one to seven years; timber berths cover certain areas granted before 1930, the date of the transfer of the natural resources from the Federal Government to the province; pulpwood leases are granted over an area of 2,748 sq. miles; and timber permits are granted to settlers and small operators at appraised rates for a period of one year or less. On the basis of a forest resources inventory completed in 1956 and other information, working plans with annual allowable cuts on a sustained-yield basis have been brought into operation in the more accessible areas.

Fire protection is one of the most important activities of the Forest Service. Fires are detected by air patrol, lookout tower and road patrol and rapid communication is maintained within the Service by radio and telephone. The Air Service transports men and equipment to fires in areas beyond the reach of roads. The main air base is at Lac du Bonnet and summer air bases are maintained at The Pas, Norway House and Thicket Portage. The total area under fire protection is about 97,000 sq. miles.

Regeneration of the forest is dependent mainly on natural means although 5,250,000 trees were planted during the past five years as part of the Federal-Provincial Agreement (see p. 477). The Pineland Forest Nursery is operated at a point near Hadashville to supply planting stock for denuded areas of Crown land and to furnish farmers with shelter-belt and woodlot seedlings.

The province has no forestry research organization but co-operates with several federal services which maintain two research areas. The Department co-operates fully with federal authorities in investigating and controlling forest damage resulting from insects and diseases. The Forest Service also carries out public education in the fields of fire prevention and forest conservation. Use is made of all usual methods including radio, television, newspapers, signs, talks to school children and club members, film tours, etc.

Saskatchewan.—The forests of Saskatchewan, including watered areas, are located mainly in the northern half of the province and cover 147,360 sq. miles or 58 p.c. of the total area. Provincial forests constitute approximately 92 p.c. of all forest land in the province and are managed and developed by the Forestry Branch of the Department of Natural Resources.

The Forestry Branch, consisting of six divisions—Administration, Fire Control, Forest Management, Forest Research, Inventory and Silviculture—is responsible for developing and evaluating forest policies and management programs based on the findings