Department of Resources and Development conducts research in silviculture, management, forest air-surveys, forest-fire protection and forest economics. District offices and forest experiment stations are maintained in Newfoundland, New Brunswick, Quebec, Ontario, Manitoba and Alberta. An extensive program of research is under way on the experiment stations and on other lands, where an increasing proportion of the total effort is being expended in co-operation with provincial authorities and industry.

Research in silviculture and management has been concentrated since World War II upon problems of regeneration, growth and stand development, and harvest cutting methods. A regeneration survey extending from the Rocky Mountains to the Atlantic coast has provided information on the status of regeneration on cut-over and burned lands and has been followed by more intensive work to assess the factors responsible for the success or failure of regeneration and to devise practical methods of obtaining reproduction. Studies are made of growth and succession in the most important forest types and of development of a satisfactory basis for classifying forest sites for effective growth and productivity. Research in tree breeding is also carried on for artificial propagation by selection and development of superior strains. Research in forest management devises methods of applying the knowledge of silviculture, regulation of cut and protection in order to manage the forest at its highest production level. A management plan has been prepared for a 300 sq. mile area to be operated by a large pulp and paper company as a demonstration sustained-yield unit.

Forest-fire protection in Canada is a vital problem, and is therefore a major concern of federal and provincial forest authorities. Forest-fire protection of Crown lands is the responsibility of provincial forest services but federal-owned forest lands such as the National Parks, the forest experiment stations, and those in the Yukon and Northwest Territories are the responsibility of the Federal Government. Other organizations responsible for forest-fire protection within their respective territories are the forest protective associations in Quebec and company organizations on privately owned forest land in Nova Scotia and British Columbia. In the field of forest-fire research, the Federal Forestry Branch is working towards full co-operation with the provincial forest services in achieving the best methods of forest-fire protection. The leading contributions of the Branch to date have been in the field of fire-hazard research and in the development of equipment and techniques for fire fighting. Increasing attention, however, is being given to research in such fields as fire-control planning, visible area mapping, detection and communications equipment, and the training of fire crews. A number of provincial forest-protection services are also engaged in research activities. Notable advances have been made in several provinces in the development of forest communications equipment, the dropping of supplies to fire fighters by parachute, and the design of mechanical fire-fighting equipment.

Research in forest air-surveying is of considerable importance because aerial photography provides an excellent means of obtaining reliable information on the extent, character and volume of forest resources. Data from air-photographs are correlated with field work to develop techniques of timber estimating. Statistical formulæ based on stratification and sampling are used for volume determination. Research is being continued in methods for measuring tree images and tree shadows to determine heights, crown widths, crown closure and other data from photographs taken in different seasons of the year under various conditions. Studies are