forest fire protection, and in forest products. An extensive program of research is under way on the forest experiment stations and on other lands, where an increasing proportion of the research in silviculture and forest management is done in co-operation with provincial forest services and wood-using industries.

Research in the economics of forestry provides the basis for intelligent decisions on the economic aspects of managing forest lands and of utilizing their products and services. It embraces the whole range of economic activities that relate to the use of forest resources, including the fields of consumption, distribution and processing of the products of the forest.

Research in silviculture and management is concentrated mainly in (*a*) assessing the factors responsible for success or failure in securing natural regeneration following practical cutting methods and different treatments of seed beds, (*b*) comparing different methods of seeding and planting, and (*c*) determining the effects of different methods of harvest cutting on the development of residual trees and stands. Studies are made of growth and yield and of successional changes in most of the important forest types. Techniques used in mensuration are constantly under review and study; new methods are tested and developed. Application of silvicultural techniques as well as research in regulation of cut and in methods of protection are aimed at determining how forests may be maintained at the highest levels of production. The relationships between forest growth and site are being studied with a view to the assessment of long-term productivity. The requirements of light and temperature that will produce optimum conditions for growth and development are being determined for the seedlings of many important species of trees. The physiological processes of growth and reproduction are under investigation in a limited number of species. The tree breeding program comprises selecting and developing superior strains and improving techniques for propagating new strains through artificial or controlled pollination. Research in forest soils is directed toward determining the relation of tree growth and nutrition to chemical and physical properties of the soil.

Forest fire protection is a vital problem and is therefore a major concern of federal authorities. In forest fire research the federal Forestry Branch is working toward full co-operation with the provincial forest services in achieving the best methods of forest fire protection. The leading contributions of the Branch have been in the field of fire danger measurement and in the development of equipment and techniques for fire fighting. The more important studies being undertaken at present include development of methods and techniques for classifying fuel types and mapping them, development of methods of rating the severity of fire seasons and of determining the efficiency of fire-protection associations and testing of equipment, such as back-pack tanks and hose, used in fire suppression.

Research in forest inventory methods is of increasing importance because of greatly expanded programs of forest inventories being conducted in most provinces and in the northern territories. Data from air photographs are correlated with field work to develop new techniques of timber estimating, which is being facilitated by the use of stand volume tables. Various methods of field sampling are being investigated and compared. Research is continuing in methods for measuring tree images and tree shadows to determine heights, crown widths, canopy density and other data from photographs taken in different seasons of the year under various conditions. The use of large-scale photography of sample areas is also being investigated and studies are being made in the identification of species and sub-types. Construction of suitable photogrammetric and other scientific apparatus includes equipment required by the forestry tricamera method of air photography which has been developed to provide maximum forestry information at minimum cost, and the shadow height calculator which facilitates the determination of tree heights from shadows in air photographs.