

Fundamental studies of soil micro-organisms are being conducted as a basis for application to practical problems of soil fertility and crop health. Research is also conducted on the inoculation of seed and soil by nitrogen-fixing bacteria; microbiological methods for evaluating soil fertility; and the relation of soil micro-organisms to soil-borne plant diseases. Other research projects deal with such diverse problems as fowlbrood diseases of bees, the development of microbiological methods for vitamin assay, and the detection of new anti-biotics which may have important applications in agriculture.

Weeds constitute one of the more important problems with which the farmer must contend. In the botanical laboratories, research is in progress on the occurrence and distribution of weeds throughout Canada. Life histories of weeds are studied together with methods of control of certain species. Physiological studies on the effects of herbicides are being carried on.

The Dominion Arboretum and Botanic Garden grows an extensive collection of trees and shrubs that is of much interest to horticulturists, botanists and the general public. A plant identification service is provided and research conducted on the classification and distribution of the native and introduced plants of Canada.

In an effort to reduce the losses from seed-borne diseases of crop plants, seed-testing techniques are being investigated with a view to determining the presence of pathogenic organisms in or on the seed. Various commercial disinfectants and seed-treating machines are under test to determine their value in the control of seed-borne diseases.

Diseases of cereal and forage crops are under constant study with the object of evolving effective measures and developing resistant varieties which will produce satisfactory crops in the presence of disease organisms. Similar investigations are conducted with horticultural crops with major attention directed to crop protection and disease control rather than development of resistance. In the case of potatoes, however, breeding for disease resistance is being carried out in co-operation with the Experimental Farms Service.

In the chemical laboratories of Science Service, research projects are in progress on animal nutrition, food and plant chemistry, soils, fertilizers, and vitamin and physiological chemistry. A study of factors affecting the digestibility of feeds and an evaluation of feeding stuffs on the basis of digestibility, together with research on the biological value of proteins and non-protein nitrogen in which stable isotopic tracers are employed, will provide useful information for the scientific feeding of different classes of live stock. Vitamin studies include the mode of action of vitamins A and D, the utilization of precursors and the effect of other dietary factors on vitamin action, together with a critical evaluation of both chemical and biological methods of vitamin assay. Studies in progress demonstrate the usefulness and the dangers of hormonal stimulation and of endocrine depressors for dairy cattle and poultry. Of interest also to the stockman is the chemical and biological diagnosis of pregnancy and the tattooing of live stock for identification purposes.

Research in soil chemistry includes a study of the colloid fractions of soils in relation to soil types, soil fertility and phosphate fixation; a study of the composition of soil organic matter and its maintenance in cultivated soils; an investigation of the mineralogical composition of Canadian soils; the adaptation of chemical methods for the determination of fertilizer requirements of soils, and studies of the minor element content of soils in relation to physiological disorders of plants and animals. Soil fertility investigations are conducted in the field and greenhouse