

By such biological methods, satisfactory results have been obtained in the control of several important insects, including pests of both farm and forest.

**Research on Animal Production.**—An increasing proportion of the field crops grown in Canada is being fed to live stock. Domestic animals are fed on natural and cultivated pastures, and on grasses and other crops harvested for winter feeding. The winter rations may be supplemented by the use of highly processed feeds containing the necessary minerals and vitamins to take the place of the sunlight and natural feed obtained during the summer months.

The animal husbandman, with the aid of the chemist, is constantly seeking for improved methods of feeding in order to produce strong, healthy live stock of the proper market type. The increased production of milk, eggs, and other animal products places a great strain on the constitution of domestic animals. The large amount of materials required by the animal body to produce human foods makes it necessary that the ration for the domestic animal contain much larger amounts of food constituents than is the case under natural conditions where production is limited. A balance must always be preserved between the ability of the animal to consume rough foods that are turned into human foods, and its disposition to remain in normal health and to produce economically. This raises research problems that require the utmost skill of the animal husbandman and the chemist.

The animal breeder is constantly on the search for improved blood lines that may be used in raising the standard of quality of the live stock throughout the Dominion. Careful recording of the performance of herds and flocks under the control of the Department, and studies of the best strains available from other sources, are functions of the animal husbandman and the geneticist. New breeds of live stock cannot be produced as rapidly as new strains of crops, and the improvement of existing strains is the main endeavour at present. An effort is being made, however, to develop new strains of sheep, swine, and poultry; this may eventually result in the establishment of breeds most suitable to Canadian conditions.

Research that has as its object the establishment of the most efficient means for the control and prevention of animal diseases is carried on continuously. Priority is given to diseases of major economic importance in the breeding and production of the various classes of live stock, poultry, and fur-bearing animals. Intensive research is made into the nature, causes, and effects of the more specific infectious diseases, their sources and tributaries, modes of transmission, reservoirs, carriers, and intermediary hosts. The possibilities of vaccination and immunization are explored and developed. Pathological determinations and laboratory tests, isolation and propagation of causative organisms and viruses, the preparation of diagnostic reagents, vaccines and serums, animal inoculations and experiments, are all included in these exacting studies and tests. In addition, studies are in progress relating to the occurrence and control of internal parasites preying on farm animals.

Regulations govern the manufacture in Canada and the importation of serums, vaccines, and similar products, some of which are prepared at the Departmental laboratories. All these products are subject to safety and efficiency tests. Quarantines, regulations, and standard methods, based on research and administered by officers of the Department, assist in controlling established diseases and in preventing the introduction of destructive diseases common to many other countries.

**Research in Processing and Marketing.**—As a basis for the framing of effective regulations concerning the interprovincial and export movement of farm