

Enlightened breeding, feeding and management practices have been responsible for substantial increases in yields of milk per cow and in the egg production of the national poultry flock. Beef cattle, hogs, and turkey and chicken broilers are being brought to market weight earlier as producers take advantage of scientific feeding. Livestock rations may now include vitamins, minerals and antibiotics for pigs and poultry, and stilbestrol for beef steers, which are combined with proteins and other elements to promote more efficient utilization of feed. It has been estimated that if these improvements were applied to all the current volume of feed, 1,000,000 market pigs, 300,000 market cattle and 43,000,000 doz. eggs would be added to annual production.

Extensive studies on the causes and control of diseases and parasites of livestock, fur bearing animals and wildlife are carried on with the result that epidemic outbreaks rarely occur and when they do are quickly suppressed. Live animals and meats must attain the high standards required in the export trade.

A matter of constant concern is the protection of crops from diseases and pests. Chemicals have proved to be potent control weapons. More than 24,500,000 acres were sprayed in 1964 to control weeds. About \$14,600,000 worth of herbicides were sold and an equal amount was spent on other chemicals for control of insects and diseases. Extensive research must be carried on constantly to assure the proper application of these chemicals, so that plant and animal produce is safe for human food.

There is also a continuing search for other methods of control. Many weeds can be eradicated by proper tillage and cropping methods. A few have been controlled by insects which feed on them exclusively and destroy them. Fungus diseases may be checked by developing resistant varieties of crops. In biological control, parasites or predators are produced and released to prey on certain insects and eliminate them. Sterilization of male insects by radiation or chemical means is another method of reducing insects of various kinds.

An area of special interest is that of farm mechanization in which there has been tremendous development in the past sixty years. Census figures show farm machinery valued at \$108,666,000 in 1901, \$596,046,000 in 1941, \$1,933,312,000 in 1951 and \$2,568,632,000 in 1961. The value has increased over nineteen times in the period and the greatly increased use of constantly improving machinery has had a profound effect on farm management, both physically and economically. The Research Branch is taking steps to expand its studies of mechanization at the Engineering Research Service in Ottawa and in the Maritime Provinces and universities are being encouraged to study the subject more intensively.

Soil surveys are conducted in all provinces in Canada in co-operation with provincial departments of agriculture and the universities. Soils are examined and classified as to their chemical and physical characteristics and potential productivity. This information is of inestimable value in setting up land uses under the Agricultural Rehabilitation and Development Act administered by the Department of Forestry. Soil fertility continues to receive attention on a national basis and is under study at all experimental farms and at many research stations. The Research Branch also co-operates very closely with the universities in this national project.

Agrometeorology, a relatively new discipline, is opening new opportunities to growers to make the most use of the heat, light and moisture available in each farm area.

As previously stated, while most agricultural research in Canada is carried out by the CDA, important programs are also undertaken by the provincial governments and agricultural colleges. Close liaison exists between these different agencies to avoid duplication and to ensure that the services offered by the Federal Government through provincial extension officers is of the kind farmers need. Federal research establishments across the country are represented on provincial committees concerned with field crop varieties,