

*Agricultural Botany.*

There has been a large increase in the numbers of weeds, grasses, and other forage plants, and of Native plants, received for identification from all parts of the Dominion. The main inquirers are farmers, seed firms, school teachers and children, and officers of the Department. In regard to the latter it is satisfactory to note that there is a growing realization among them of the necessity of being able to distinguish accurately between the different plants—useful and otherwise—with which they have to deal. This requires a knowledge of the characters separating species superficially alike but often of quite different importance in practical agriculture. In this connection is the use of the botanical name of definite meaning, in conjunction with—not necessarily instead of—the common name, which is often of the vaguest application and has caused much confusion in the past.

In view of the increasing importance of the systematic side of the botanical work, particular care is being given to the herbarium, and a great many new specimens are being added to it, while much has been done as regards its arrangement and preservation.

In the matter of weed-control, local facts in the ecology of the plants concerned are of the greatest importance. Acknowledgments are due to many of the field officers of the Department, whose memoranda covering specimens forwarded for identification are valuable in this way. Particular use is often able to be made, for example, of the correlation of a series of facts received about an individual species growing over many different types of country.

*Blackberry Investigation.*

No marked developments can be reported in connection with the offer of £10,000 as a bonus in connection with the control of blackberry. Various spray fluids not previously tested have been applied. So far such means of control seem applicable only to certain types of blackberry land. The value of goats as a means of control has been sustained, as also has the advantage of cutting at certain seasons rather than at others. Control by natural enemies, such as by insects or fungi, has so far not materialized—in fact, no single specific implement, method, or organism is as yet forthcoming for dealing successfully with this weed in the variety of locations and circumstances in which it is found. Rather, it would seem, must different means be devised for control according to its various forms and habitats.

*Entomology.*

The work of the entomological service has been extended officially to include forest entomology; for this purpose an additional assistant was appointed. In consequence the year's work can be grouped as follows:—

(1) *Agricultural*.—(a) Sheep maggot-flies: A monograph on the sheep maggot-fly position in New Zealand was prepared, and deals with the systematic and economic aspects of the question: this work (some 200 pages in all) will be published in two parts. Experiments with various chemical preparations, in the form of dips, were carried out, but the results have been negative so far. Considerable success was attained in the rearing of the maggot-parasite, *Alysia manducator*, secured from the Imperial Bureau of Entomology, London, and extensive liberations have been continued. (b) Grass-grub parasite: One of the *Tachinidae* attacking melolonthids in North America has been imported for the purpose of attempting its establishment against the New Zealand grass-grub. Large consignments of the North American larvæ infested by the tachinid were secured through the courtesy of Dr. Arthur Gibson, Dominion Entomologist at Ottawa, and successfully landed in New Zealand. From these consignments considerable numbers of tachinids were reared, some of which were liberated in the field, and others in a large insectary, the grass-covered floor of which was infected by the New Zealand grass-grub. (c) Subterranean grass caterpillars: Studies of these insects were undertaken to ascertain the seasonal and geographic range of the species in question. (d) Earwig-control: The hedgehogs liberated at Alexandra during the 1927 season were found not to be established, and to have died out. The experiments with poison gave very satisfactory results, and it would seem that method will eventually prove to be the most effective method of control. (e) Pear-midge control: It is definitely ascertained that the pear-midge parasites have become established and have already shown conclusive signs of controlling the midge.

(2) *Forest*.—(a) Forest-insect survey: A survey of the insect conditions in the exotic forests throughout the Dominion was commenced, and Canterbury, Taranaki, and the southern part of the Auckland Province have been completed. (b) Timber-weevils: A special study of the weevils attacking the milled indigenous timbers is being made, with the object of formulating control measures at the timber-mills. (c) Gum-tree weevil: Through the courtesy of the South African Entomological Service a mymarid egg-parasite of the gum-tree weevil was imported from Australia, successfully reared, and liberated throughout New Zealand. (d) Gum-tree scale: Distributions of the ladybird *Rhizobius ventralis* were made in several localities where the scale was epidemic. (e) Steel-blue saw-fly: Two parasites of this insect have been located in England and have been studied at Farnham Royal. The first consignments are expected in New Zealand this spring and summer.

*Mycology.*

Work on cereal-smuts control during the year was directed in part towards modification of the present hot-water treatment in use; with a view to lessening the risk of loss through damage to seed. The fourth season's experiments on smut-control have shown conclusively that control is possible through treatment of small lines and bulking these aseptically until a sufficiency has been obtained for commercial distribution. As an example, it may be said that all malting-barely grown in the Leeston district of Canterbury is this year free from covered and loose smut.