

claims made overseas about the utility of various recently discovered weed-killing materials. In general, investigations have indicated that claims made for hormone weed-killers in the control of perennial weeds are, as a rule, somewhat overrated. At the same time, it has been evident that the effective use of chemical weed-killing methods depends on a complete knowledge of the plants concerned and of the conditions under which a specific weed-killer may be applied satisfactorily.

In addition to the examination of the more important pasture weeds—blackberry, gorse, and ragwort—a number of special problems have been investigated—for example, the extermination of willows and aquatic weeds obstructing streams, canals, and drainage ditches. There is convincing evidence of the continued spread of willows and *Poa aquatica*, and also abundant evidence to indicate how great will be the cost of clearing existing infestations.

Microbiology Studies

Staff and equipment of the microbiological section have been built up to a satisfactory level during the past year, and in the past six months in particular a considerable volume of work has been accomplished. Much time has had to be spent in finding and evolving techniques suited to local conditions and in making a survey of organisms likely to be encountered.

To date, about 50 soils of different types and treatments have been plated for counts of fungi, bacteria, and actinomyces, numbers varying from 2,000,000 to 15,000,000 per gram of soil. Peat samples have shown high fungal numbers, though of limited flora, this being in conformity with the prevailing high acidity, though relatively large numbers of actinomyces, which are more usually found in conditions nearer neutrality, were present.

Rhizobium studies in relation to peat soils have been continued and a trial laid down on Rukuhia peat of various white and subterranean clovers, inoculated and uninoculated. Nodulation of clovers growing on peat is not uniform and isolations from some of the plants have shown different strains to exist. At present some 50 different isolations are under test to isolate an effective strain.

About 30 different actinomyces have been isolated from Hamilton clay loam and peat. In view of the function of these organisms in the breakdown of nitrogenous materials, these are being typed and will be further studied. Nitrification studies along normal lines have given erratic results and further work is to be done using the soil-perfusion apparatus.

No azatobacter have been isolated, but radiobacter type of organisms are present and several have been isolated.

Microbiological work on peat has also included the plating of soils from different field, plot, and pot trials, and rhizosphere studies of the main grass and clover species growing in peat have been started.

Analytical Services

Three hundred soils from field trials have been tested, and results will soon be ready for correlation with observed field responses. It is expected that information of value to both laboratory and field staff will be gained from the results. Soils from research areas at the Station, field trials, and pot experiments have been analysed by standard methods.

Soils submitted for analysis for advisory purposes numbered 200, and field officers were provided with analysis and comments on the nutrient status of the soils for farmers' information. The use of this service is increasing, and it is hoped that equipment will be available shortly to enable Instructors to make their own tests.