

advisory officers of the Division are particularly well equipped for carrying out this important function, inasmuch as most of them having been trained at various agricultural training centres are fully conversant with the research work conducted at such institutions, and from their contact with farmers are able to gauge the applicability of such research work to farming practice. Apart from this, the field research work carried out by the Department's own research workers and Instructors has proved a most fruitful source of information, and, as has been amply demonstrated, has conferred considerable benefits on the farming community.

The close co-operation which exists between research workers and the extension service again amply demonstrates how inter-dependent they are, and emphasizes how the work as a whole would, to a large measure, be stultified if the various phases of activity were divorced from each other. Only by the successful co-operation which exists can field problems be intelligently approached and the necessary field experience and assistance be secured, and to this co-ordination in large measure is due the advances which in recent years have been made in field research.

INTRODUCTION OF SODIUM CHLORATE.

The present wide-spread use of sodium chlorate as a means of keeping weeds, especially ragwort, under control in our grasslands is the direct outcome of experimental work initiated by the Fields Division, in which it clearly demonstrated that the use of this material when applied in certain strengths effectively killed the weeds and thus enabled farming operations to be carried out in districts where grazing, especially with dairying cattle, was at least a precarious undertaking.

As a result of this experimental work, the farmer has now a reliable method, which is extensively used, for controlling ragwort and other weeds, and due to the fact that the Government is subsidizing sodium chlorate, and thus facilitating its sale to farmers, the general outcome of the initial experimental work carried out by the Division has proved and will continue to be inestimable value to the Dominion.

EXPERIMENTAL PLOTS.

The solving of farmers' problems in the field by means of experimental trials in connection with such matters as pastures, manures, crops, &c., is an important function of the Division. Much of the instructional work is based on the results of these trials. To determine the value of manures, strains of grasses, and varieties of crops, &c., work must be localized, and the co-operative trial, where the farmer supplied the labour and the Division the material and supervision, is an important activity. Many modern practices and the breaking-down of much conservative procedure are two matters upon which local experimentation has had a bearing. At present approximately eight hundred co-operative trials are being carried out by the Division.

WHEAT MANURING EXPERIMENTS.

Wheat-manuring experiments conducted in the South Island over the past twelve years showed that the use of 1 cwt. of superphosphate with wheat gave an average increase of 4 bushels per acre. This represented a profit of approximately 300 per cent. on the outlay for manure.

Moreover, the trials have indicated that it is unwise to use a larger quantity of super than 1 cwt. per acre, since the returns from the extra quantity do not give yields commensurate with the extra cost.

The use of fertilizer, chiefly superphosphate, has increased in the South Island from 66 per cent. of the acreage sown in 1928-29 to 82 per cent. in 1934-35.

WHEAT VARIETY TRIALS.

A large number of wheat-variety trials have been carried out in the South Island. These have proved the undoubted superiority of Solid Straw Tuscan over other standard varieties in most districts in Canterbury, but they have also been the means of eliminating many new varieties, chiefly novelties from abroad, which have been shown to be unsuitable for Canterbury conditions.

The farmer may lose heavily in growing on a large scale new varieties which have not been proved, and it is claimed that the trials referred to above have been the means of saving much expenditure and disappointment which would inevitably result if individual farmers experimented with new varieties.

WHEATS : NEW VARIETIES.

Close co-operation has been maintained with the Wheat Research Institute in trying out on a field scale varieties which have shown promise in small trials at Lincoln.

Notable among these is Cross 7, which is a cross between White Fife and Solid Straw Tuscan, and combines the high milling and baking qualities of the former with the heavy-yielding qualities plus high wind resistance of the latter. Extended trials during the past two years have shown that Cross 7 yields on the average only a fraction of a bushel per acre below Tuscan, but as the Cross is expected to command a premium in view of its quality it is likely to be grown fairly extensively in the future.

Preliminary trials with two Portuguese varieties indicate that in these we may have available a satisfactory wheat for spring sowing. The latter has been a long-felt want among wheat-growers in the South Island.

TURNIPS AND SWEDES.

Several varieties of swede and turnip which are highly resistant to club-root have been introduced, and have been put under thorough trial in competition with standard varieties, chiefly in Southland.

After several years of trial the Bruce turnip and the Wilhelmsburger Otofte swede have proved highly resistant. It is not too much to say that the use of such varieties as these on badly infected land means the difference between a reasonable crop and an utter failure in many cases.