

## REPORTS FROM BRANCHES

## AGRONOMY DIVISION

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The amalgamation of the Agronomy Division and the wheat-breeding section of the Wheat Research Institute takes effect on 1st April, 1950. Located at Lincoln, both are concerned with crop improvement and use similar facilities. In future, improvement of all field and vegetable crops will be looked after by this organization, which has been named the Crop Research Division.

## PURE-SEED PRODUCTION

*Management of Experimental Area.*—The production of the nucleus seed of standard varieties—usually an acre or two each—has by agreement been taken over by the Department of Agriculture, and the effect of this change will be threefold. Firstly, it will arrest the depletion of soil fertility brought about by heavy cropping since 1936; of the five 20-acre blocks now formed, there will be three under recuperative pasture, one under autumn-sown, and one under spring-sown experimental plots. Secondly, it will bring about a much greater uniformity in the utilization of the area, and hence in its soil conditions. Thirdly, it will free space, staff, and resources for intensive research in crop improvement.

The early stages in the production of pure seed, requiring small areas only, remain a responsibility of the Crop Research Division, as does, for the time being, the seed-dressing of the nucleus lines produced by the Department of Agriculture.

## DISEASE RESISTANCE

Diseases and insect pests take a heavy toll of many of our crop plants: seed treatment is an effective and, on the whole, inexpensive defence against some of these, and certification of disease-free seed-crops gives further protection. Both have their limitations, especially in dealing with pests that are not readily recognized, and both fail against many soil-borne and all air-borne diseases—and insects—that infect the plant rather than the seed. Horticultural crops can be protected with fungicides and insecticides, but these as a rule cannot profitably be applied to field crops with their larger area and lower value per acre. The production of immune or resistant varieties is the most effective defence, and also the most economical because the first cost is the last cost. Once the research worker has produced an immune variety, the grower need no longer fear that particular disease; nor is he faced with costs of protective sprays.

Some notable successes have already been achieved with the introduction or breeding of resistant varieties. Introductions include club-root-resistant rape, which is giving excellent yields in areas where club-root has made the growing of rape precarious; R<sub>1</sub> (Stakhanovetz) linen flax and Cheyenne linseed are both resistant to the New Zealand strains of flax rust; Achilles oats, an Algerian type, is resistant to leaf-rust and stem-rust; and Calder swede, produced at the Agronomy Division, is strongly resistant to aphid attack and to turnip-mosaic, and moderately resistant to dry-rot, club-root and mottled-heart.

During the year an officer of the Plant Diseases Division has been stationed at Lincoln with the Agronomy Division. A glasshouse unit, specially designed for disease work, has been erected by the Agronomy Division staff. Major projects commenced include breeding for resistance to wilt of peas, rust of flax, mildew of wheat, stem-rust and leaf-rust of oats, and club-root and aphid of Brassica crops. Work on resistance to blight and virus diseases in potatoes can now be increased with the impending completion of the potato greenhouses. Other crops—especially the main vegetable crops—will be included as soon as possible.