AGRONOMY DIVISION, LINCOLN

Acting-Director: Mr. R. A. Calder

PLANT-BREEDING

During the war period it was possible to undertake only a limited amount of breeding-work, but with the return of staff from overseas, activities in this direction will be extended.

*Oats.*—The main objective in the oat-breeding work is to develop high-yielding, good-quality oats which might be resistant to lodging. The variety Resistance has been used as the stiff-strawed parent.

Resistance × Onward: Of the eighteen hybrid lines grown last year, ten were retained for further trial this year, and of these seven are to be retained for the coming year.

Resistance × Algerian: Of the fifty-seven hybrid lines grown last year, twenty were retained for further trial this year, and of these ten are to be retained for the coming year.

An additional series of $F_6$ hybrid lines derived from crosses between Resistance and Grey Winter and Resistance and Alaska is to be grown for observation and selection during the coming season.

A further objective is the development of improved rust-resistant varieties, and a series of $F_2$ hybrid lines, in the establishment of which the resistant variety Victoria was used as one of the parents, is to be sown for observation and selection.

*Barley.*—A recent development has been the initiation of a barley-breeding project, the purpose of which is to develop a high-yielding malting variety of good quality which might be more suited for heading than the standard varieties. Maja, Kenia, Victory, and Wong, which are comparatively stiff-strawed varieties, have been crossed with Spratt Archer, Plumage Archer, Chevallier, Golden Archer, Gisborne, Pioneer, and Campton. An attempt is being made to propagate the $F_1$ plants in a specially adapted glasshouse during the winter in order that $F_2$ seed may be available for sowing in the spring.

*Garden Peas.*—The chief aims in the garden-pea-breeding work are—

(1) The development of an early variety superior in yield to William Massey (Kelvedon Wonder). During the past season several hybrid lines from the following crosses were grown both in a hand-sown yield trial and as spaced plants for further selection:—

(*a*) William Massey × (Greenfeast × Greatcrop).

(*b*) William Massey × [(Greenfeast × Greatcrop) × Harrisons Glory].

None of the lines was as early as William Massey, but several were only a few days later in maturity and gave higher yields.

A further extensive series of crosses was made.

(2) The development of a Greenfeast (Lincoln) type resistant to pea mosaic, using a mutant form found in Greenfeast as the resistant parent. Some of the most promising lines from the following crosses were included in a hand-sown yield trial using Greenfeast as control:—

(*a*) Greenfeast mutant × Greenfeast.

(*b*) Greenfeast mutant × (Greenfeast × Greatcrop).

(3) The development of a variety suitable for canning at the green-pea stage. Onward has been crossed with William Massey, Greenfeast, and Greencrop, and during the past season $F_1$ plants were propagated.

*Field Peas.*—Partridge peas are grown quite extensively in Canterbury, and breeding-work is being undertaken with a view to developing a type with shorter straw, ripening more evenly, and possessing higher-quality seed than the standard variety; commercial Partridge has been crossed with Black Eyed Susan, Mammoth Blue, and Dutch Blue, but the hybrid material is still in the early stages of investigation.