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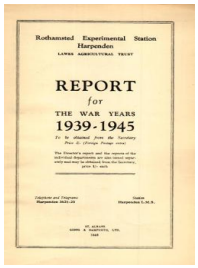
ROTHAMSTED RESEARCH

Report for 1939-45

Full Table of Content



The Classical and Other Field Experiments

Rothamsted Research

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recognise the deficiencies of lime and phosphate so common in such land. The National Farm Survey deals with such aspects as tenure, condition of farm, incidence of insect pests, quality of farming and supplies of electricity and water. The object of the Wireworm Survey was to evolve methods suitable for assessing wireworm infestation of particular fields so that advice could be given to farmers on cropping and preventive measures.

The classical and other field experiments

Field experiments continue to occupy a prominent place in the Rothamsted programme, and in addition to the large number of experimental plots on the farms at Rothamsted and Woburn many field experiments have been carried out on private and institutional farms in various parts of the country.

For many years, there has been co-operation with Mr. A. W. Oldershaw at Saxmundham and Tunstall, and this has been continued. In spite of, or perhaps because of, the war the number of modern experiments as distinct from the classical experiments on the Rothamsted farm has increased greatly. There are long-term experiments, including rotation experiments, to study the effects of deep ploughing, various methods of returning straw to the land, the response of fertilisers in relation to season, and several other problems. There are also annual experiments in which the effects of treatments are measured in a single crop.

The classical experiments have been continued. The earlier work by the Botany Department on the reduction of the weed-seed population of arable land by fallowing led to the establishment of a five-year cycle on Broadbalk whereby one section is fallowed each year. Samples taken annually over a long period of years support the conclusion that the routine fallowing of one section per year has fully justified itself, as the weed-seed population has not only been kept in check but has also decreased during the 15 years that the system has been in force. This is particularly so in the case of poppy which has been decreasing steadily since periodic fallowing was instituted in 1925. Recently, however, trouble has arisen from the spread of species of wild oats, and special experiments are being carried out to find, if possible, some effective way of controlling this weed.

The botanical analyses of the herbage of Park Grass and High Field that were slowed up during the war years are now being dealt with, and the accumulation of analytical and observational data for many years is being examined and prepared for publication in order to bring the ecological history of the plots up to date.

Because of the urgent need for food production the non-experimental areas on the farm at Rothamsted were farmed as intensively as possible. Old grassland was broken up and the arable acreage increased from 137 in 1938-39 to 308 in 1944-45, whilst the value of the produce sold for these years rose from £2,922 to £7,401.

The timber in Knott Wood was not included when the farm was purchased in 1934, and, when it was felled, we were left with an area of about 74 acres of derelict land full of tree stumps. Part was replanted and part has still to be dealt with, but an area of about 24 acres was reclaimed in a variety of ways. In one section the land

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was sown out to pasture without removing the stumps and without cultivation, in another cultivation was carried out, and in a third the tree stumps were also removed and the land has since been cropped.

The Crop Physiology Section has acted as a link between farm and laboratory, preparing the detailed plans of the field experiments and exercising general supervision from the laboratory side. This Section also carried out certain urgent investigations arising from the war. One of these was concerned with damage to crops that might be caused by war gases, and another with the storage of potatoes in clamps. These duties curtailed the work on the factors affecting leaf growth and leaf size on which the Crop Physiology Section is engaged.

Woburn Experimental Station

The work at Woburn (run by Rothamsted since 1926) has been continued under Dr. H. H. Mann. The light, somewhat sandy, soil is derived from the Lower Greensand and is in marked contrast to the fairly heavy soil from the Clay-with-Flints at Rothamsted. Woburn, therefore, provides a useful centre at which experiments carried out at Rothamsted can be repeated on a very different soil type.

The continuous wheat and barley experiments, commenced at Woburn in 1876, have been greatly modified, following fallows in 1927-28 and 1933-34 to get rid of weeds, and since 1940 the influence of previous manuring on the effectiveness of nitrogenous manures has been studied. Amongst the more recent work is a rotation experiment, similar to one at Rothamsted, with artificial manures only, which has been going on since 1930, and so far there is no sign of any deterioration in the crops. In 1938 an interesting long-term alternate-husbandry experiment was started to compare the fertility of soil, after three years under a grazed grass-and-clover ley, or under lucerne cropped annually for hay, with land which carries a well manured arable crop each year. Other experiments deal with cultivation problems, green manuring, the making of a market-garden soil, the manuring of sugar beet, take-all diseases of wheat and barley, and various other problems. Several lines of work are also being carried out in the pot-culture station including the studies on clover sickness commenced about 10 years ago : the conclusion has been reached that the disease is due neither to an eelworm nor to a fungus.

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