ROTHAMSTED RESEARCH

Report for 1949

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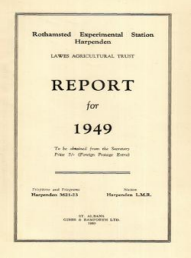

The Farms : Rothamsted

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THE FARMS

By J. R. Moffatt

Rothamsted

During the year under review, no major changes of policy have taken place. Now that farming conditions are reasonably stable, the aim has been to secure sufficient staff, equipment, and materials to maintain a high standard of productivity both on the experimental field plots and on the non-experimental areas of the farm.

Field Experiments

Details of the field experiments are given in the report of the Field Plots Committee.

The number of experimental field plots, planned by the Field Plots Committee, increased from 1,412 in 1948 to 1,536 in 1949. The weather was helpful throughout the year in enabling the work on these plots to be kept up to schedule, but it had a detrimental effect on the yield of all root crops and grass plots. In the new and complex ley-arable experiment which started in the autumn of 1948 (and was described in the 1948 report) many difficulties were encountered, some of which had been anticipated. It was fortunate that only a third of the experiment was started during the year, and that the growth of grass on the plots to be grazed was severely limited by the drought. Modifications have been made in the experiment which should overcome most of the difficulties in the future. The direct re-seeded grass plots on the old grass field took well and a very satisfactory plant remains for the 1950 season. Similar plots on the old arable land had to compete with strongly-growing arable-land weeds, and were also much more affected by the drought, and the plant suffered in consequence. Spraying was done with 15 per cent. B.O.V. (sulphuric acid) to kill the Knot-grass (*Polygonum aviculare*), in which it succeeded, but some plots have had to be ploughed up ready for a fresh start in 1950, while others will need patching.

Cropping

The area farmed remained at 474¾ acres, of which 242 acres were under tillage crops and 102 under leys, giving a total arable area of 345 acres. The main crops were: wheat 72 acres, barley 69 acres, oats and dredge corn 17 acres, potatoes 31 acres, mangolds, sugar-beet and kale 25 acres, with smaller areas of linseed, rye, beans, peas, lucerne and vegetables. 5 acres, all under experiment, were fallowed. The main difference between the 1948 and 1949 cropping was the decrease in the area under wheat and a corresponding increase in that of barley, and an increase in the area under temporary ley. The area of permanent grass was reduced to 99 acres by the ploughing up of part of the area previously devoted to a grazing experiment, and it is hoped to reduce the permanent grass still further in 1950.

Spring Work

The winter corn was drilled by the middle of November, 1948, most of it under reasonable conditions, and the very mild weather enabled it to germinate rapidly.

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The early months of 1949 continued generally mild and dry, and the excellent condition of the land made it possible to replough all the ground for roots, except the classical mangold field. The conditions also greatly favoured the early preparation of seedbeds for spring corn, which was all sown under excellent conditions. The continuation of the dry weather throughout March (with the exception of a light snow-fall early in the month), April, and early May enabled the seedbeds for the root crops to be thoroughly prepared, and all spring sowings were completed early in May. By the middle of the month, the dry weather and low night temperatures were retarding the growth of most crops, but the latter half of May brought much-needed rain which caused an almost immediate improvement in the appearance of all crops.

Summer Drought

The dry spell set in again in early June, when only 0·64 ins. of rain fell, and a long summer drought then developed. During the four months June-September inclusive, only 4·03 in. of rain fell, compared with the average of 9·68 in. The mean temperatures and hours of sunshine were well above average for each of these months.

The hot and dry conditions did not appear to affect the cereal crops, which looked very promising throughout the season, except on one field where the wheat plant was thin. Some of the wheat showed signs of coming into ear in mid-June, and all crops ripened earlier than usual. Several of the corn crops were treated with herbicides with very satisfactory results. One field of barley after a well-manured crop of potatoes became lodged fairly early, while thunderstorms about mid-July, although affording some relief from the drought, caused further lodging, although the damage was only severe in patches.

The hand-pulling of wild oats on Broadbalk wheat plots, carried out each year mainly by volunteer workers from the Laboratory staff, is effectively reducing the infestation of this weed. In 1949, section 5, which was fallowed in 1948, contained very few wild oats, but the area was hand-pulled thoroughly. Sections 1 and 2, after a year's fallow 3 and 2 years ago respectively, contained quite a few oats, but each was hand-pulled on two separate occasions, and if labour can be secured for this operation each year until they are next fallowed, the reduction in the wild oat population will be of prolonged benefit. Section 3, due to be fallowed in 1950, contained the heaviest infestation, but the plots in this section were cleared as far as possible, with the exception of plot 8, where there were too many weeds to be pulled by hand. The 1950 fallowing will considerably reduce the weed population of this section, after which the aim will be to prevent another building-up of weeds, by hand-pulling the area each year.

The linseed crop made good initial growth after fairly early sowing, but the drought then affected it badly and subsequent growth was very slow. There was also a very bad infestation of Fat Hen (*Chenopodium album*) in the crop, but this was very effectively controlled by spraying and dusting with MCPA herbicide. The

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crop suffered slight initial distortion but soon recovered. The estimated yield of 5 cwt. per acre of seed is less than half the normal yield.

The experimental crops of peas and beans looked well throughout the season, except that the beans were severely attacked by bean aphis which, despite several sprayings with nicotine, considerably reduced the yield. A non-experimental area of beans which escaped early damage by birds was later so severely attacked that it had to be cross-drilled with a mixture of spring cereals. It was fortunate that this was done, as the beans which survived the bird damage were later so badly attacked by bean aphis that the harvested crop consisted almost entirely of cereals.

The dry weather retarded the growth of weeds in the root crops, but also the growth of the crops themselves. This enabled the regular farm staff to undertake the singling of the sugar-beet and mangold crops, which was completed towards the end of June. Fortunately the flea beetle was not so active as usual, and no precautionary dustings were needed on these crops. The kale crop, which was sown early, escaped with negligible damage, but a few later-sown areas were badly damaged. The root crops looked backward throughout the summer, very little growth being made, while the sugar-beet crop also had to contend with an early and severe attack of Virus Yellows disease.

Harvest Operations

The early ripening of the corn crops led to harvesting starting earlier than usual. Weather conditions were excellent throughout. Much of the corn which was cut by binders was carted direct from the binder rows without shocking, and was either stacked or threshed in the field. The grain from the areas cut by combine harvester was beautifully dry and free from weed seeds and green material. The wheat was sold without further cleaning, but because of the glutted state of the market the barley was held in store in the hope of better prices later. All harvesting operations were finished before the end of August and the threshing of outside corn stacks followed immediately. Yields of wheat and barley were both very good, and good yields are also anticipated from the oat crop.

Potatoes

The planting of the fairly large area of potatoes without additional labour was made possible by the use of a 2-row potato dropping attachment fitted to the hydraulically controlled toolbar of a tractor. This work was carried out in conjunction with the National Institute of Agricultural Engineering, and proved very speedy and efficient, for, as was shown by the experimental plots, the machine planting was superior to hand-planting. Besides the speed of planting, the dropper has the advantage over hand-planting that the tubers are planted direct into moist soil, whereas with hand-planting the tubers are often planted in ridges which have partially dried out. This factor is also likely to affect considerably the loss of plant if Dry Rot is present in the seed tubers. In a wetter year, it is possible that the difference in favour of the dropper would not be so marked, but the advantage is likely to remain with the dropper nevertheless. It has been the practice for several years to put

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dung for the potatoes in the ridges just before planting, but manure added in this way would foul the openers of the machine. None was therefore used in 1949 on the areas planted by this machine. In future, dung will be ploughed-in during the winter months for the potato crop.

About half the potato area was planted with seed of Scottish "A" stock, the remainder being planted with the same variety but with seed grown at Rothamsted in 1948 for which an English "H" certificate was obtained.

The crop made reasonable growth during the first part of the season, but in July, August and September growth was very slow and ripening took place much earlier than usual. There was no sign of Late Blight during the season, so no precautionary sprayings were done. The haulm was burnt off with sulphuric acid before lifting began, to facilitate this operation. The lifting of the experimental areas started in mid-September, and was finished before the end of the month. This was followed by the lifting of the non-experimental crop, for which schoolchildren were employed. Yields were only about half the 1948 crop, and individual tubers were smaller than usual, with many damaged by cutworms. The crop has been stored under cover in the Dutch Barns to an average depth of 10 feet.

Grassland and Livestock

Haymaking started early in June, but the drought considerably reduced yields. The light crop was made under excellent conditions, however, and was stacked under the Dutch barns at the farmstead. In future most of the hay will be gathered by a pick-up baler, as not only will it be easier to handle and transport, but needing a smaller team of workers it will enable the singling of the root crops to be carried out without the interruption of haymaking.

The grass and clover seeds undersown in the cereal crops in 1949 took quite well and generally look quite promising for next season. On one area where the nurse crop of barley was badly lodged, however, a considerable amount of patching will have to be done. One area which was sown without a cover crop became badly infested with Fat Hen (*Chenopodium album*) and creeping thistle, but spraying with MCPA herbicide effectively controlled both these weeds and although the plant of grasses and clovers is rather thin, it will be left down.

The effect of the drought on the pasture land was very severe. The spring flush lasted only a very short time and by mid-July the fields were very parched. A second top-dressing of sulphate of ammonia was given to some fields, but as there was no rain to wash it in it had the unusual effect of burning up some of the clovers. Supplementary food had to be given to some of the stock from July onwards, and throughout July, August and September the grass fields presented much the same appearance as the stubble fields. Hay and straw had to be carted to the stock in September, and many of the cattle had to be sold before reaching the desired degree of finish. Many of the most forward of the cattle were brought into covered yards in October, to fatten them off as soon as possible, but several which should have fattened off the grass are now being over-wintered. 66 cattle were purchased during the winter of

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1948/49, the majority of which were Irish steers. Some were out-wintered, but most were brought into covered yards to tread straw into farmyard manure. During the year ending 30th September, 1949, 71 fat cattle were sold to the Ministry of Food.

The number of Scottish Half-bred sheep in what originated as a Half-bred flock was further reduced during the season by culling, the replacements being home-bred ewe lambs out of the old ewes by Down rams. 140 ewes and some ewe lambs were put to Oxford and Suffolk rams to lamb early in April, but very few of the ewe lambs bore lambs and the lambing percentage was low. The flock has done reasonably well under difficult circumstances. The drought and consequent shortage of grass reduced the milk supply of the ewes, which affected the rate of growth of the lambs, very few of which were sold fat before the end of the year. They were folded on kale from early November, and have since improved considerably; and most will be sold early in 1950. 68 of the best ewe lambs and a few wether lambs have been retained for grazing experimental plots at Rothamsted and Woburn, and some of the ewe lambs may be brought into the ewe flock at the end of the grazing season.

Autumn Work

The very protracted drought lasted until the end of the first week in October, after which heavy rain was experienced for the rest of the month. October, normally the wettest month of the year with 3 in. of rainfall, was doubly so this year, producing over 6 in. of rain in the last three weeks, of which 2·67 fell on two days. More rain fell in this month than fell in the previous 5 months, and the land, much of which had been too hard for ploughing and too dry to work down to seedbeds, became far too wet to work. The preparation of the land for winter corn was thus considerably delayed, only a few experimental areas being sown by the end of October, 1949. However, a drying spell early in November enabled the drilling to be completed by the middle of the month, although on several occasions the conditions were not as favourable as could have been wished. The acreage of winter corn for the 1950 harvest has been considerably increased.

The delay in the start of drilling also delayed the harvesting of the sugar beet and mangolds. Mangold yields were well below average, while the sugar-beet crop was the most disappointing crop of the year. This was because of the combined effects of the drought and an almost hundred per cent. infection with Sugar Beet Yellows virus disease. Individual roots were small and the yield was considerably below normal. The sugar content too was disappointingly low, the average as returned by the factory being 14·7 per cent.

The weather in December, 1949 was much warmer and drier than usual, and this enabled the winter ploughing to be continued almost without interruption. Several fields have already been ploughed a second time, and an area of about 15 acres which has been under a long-term ley was ploughed before the end of the year.

Labour

The labour position this year was more satisfactory than for many years past. This was due primarily to the increase in the permanent staff made possible by the erection of the new cottages

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for farm workers, but the weather played its part in that the growth of weeds was retarded and those that grew were easily destroyed in one operation. The amount of seasonal labour required during the year was therefore reduced to a minimum. The only occasions such labour was needed were for potato lifting and for sorting the last of the large 1948 crop of potatoes. The last sales were made by the Ministry of Food during late May and early June, by which time the regular staff were engaged in root singling. Fortunately the potatoes stored extremely well in the large heaps, and there was very little wastage even as late as June, 1949.

Machinery

Several additions to the list of implements were made during the year. A new tractor complete with many of its own range of specialized implements was purchased, and it is hoped that this will in future undertake many of the jobs on small plots previously undertaken by horses. A small single-wheeled motor hoe has been bought to facilitate the hoeing of small experimental areas where headlands are reduced to a minimum, and a new rotary hoe will keep clean the paths between the plots.

Buildings

Towards the end of 1949, a start was made with the erection of a new farm workshop and implement shed, to house the gradually increasing number of farm implements, many of which are at present housed in buildings designed and needed for other purposes. The building will be completed early in 1950.

Local Show Successes

Two horsemen and two tractor drivers took part in the local ploughing match, and between them won 2 first prizes, 3 second prizes, and a 3rd prize.

Conclusions

The execution of the year's work has been generally less difficult than usual. There was sufficient permanent staff to deal with most operations, which were therefore done on time, while dry weather extra equipment, and the use of herbicides enabled weeds to be kept under control. The weather also greatly facilitated the harvesting of the cereal crops, and enabled work to be kept up to schedule throughout the season. The results of the year's work, due to circumstances beyond our control, have been somewhat disappointing, for although the yields of cereals were satisfactory, those of all root crops, beans and linseed were low.

Woburn

The re-organization of the Woburn Farm, which commenced in 1947, when the management was merged with that of the Rothamsted Farm, was continued with satisfactory results. The main objectives of the year's work were to arrange the cropping so as to clean up, without resorting to bare fallowing, those fields not tackled in the previous two years, and to mechanize field operations where possible to enable the existing staff to tackle the increased arable acreage, and the anticipated higher crop yields, with the minimum expenditure on seasonal labour or outside contractors.

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