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Report for 1955

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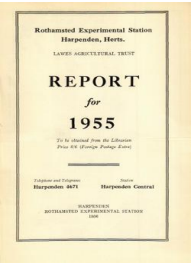
Rothamsted Experimental Station
Harpenden, Herts.

LAWES AGRICULTURAL TRUST

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THE FARMS

J. R. Moffatt

Rothamsted

The year 1955 started badly because the extremely wet autumn and early winter of 1954 seriously delayed all field operations, including the drilling of winter corn and beans. All land work was therefore seriously behind schedule at the beginning of the year. Spring operations started later than usual, but a dry spell in April enabled the full programme of work to be carried out. The hot, dry summer was very favourable to corn crops, but root crops suffered severely from the lack of rain. The autumn was very favourable to land work, and the harvesting of the root crops and the drilling of winter corn was completed without difficulty.

The Effect of Weather on Crops

Owing to the extremely wet weather conditions in the late autumn and early winter of 1954, very little winter ploughing had been done by the end of the year. Most of the small experimental areas of winter corn were drilled in October 1954, but the bulk of the corn drilling could not be done until December. The acreage sown to winter corn was lower than had been planned, and it was not possible to sow any winter beans.

The early months of 1955 did not bring any marked improvement in conditions, and only very little land work was possible during January, February or early March. By this time work was seriously behind schedule, but a fine spell in the latter half of March enabled spring land work to start in earnest. After a changeable start, April produced a long spell of fine, dry weather, and excellent progress was made with seedbed preparations and the sowing of crops. However, frequent night frosts and cold winds retarded germination and growth of all crops.

Weather during May and June was generally cold, wet and changeable, which seriously hampered farm work, further retarded growth and made weed control difficult. Conditions improved in the latter half of June, and throughout July, August and September we had hot and dry weather. All corn crops made good growth during this period, and conditions were good for both hay and corn harvests. However, the growth of all root crops was seriously affected.

The fine spell continued into October, and, while the lifting of the potato crops was facilitated, the autumn ploughing was delayed somewhat by the hard state of the ground. Rain later in the month enabled nice seedbeds for winter corn to be obtained, and drilling was completed in good time.

After a changeable start in November, more settled, dry conditions prevailed in the latter half of the month, and the lifting of mangolds and sugar beet was completed under good conditions. Mild, open weather continued until the end of the year.

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Field Experiments

A very full programme of field experiments was carried out during the year. Except for delaying the start of spring work, weather conditions were very favourable to field work, and no insuperable difficulties were met. Yields of cereals were generally very satisfactory, but there was a disappointingly small response to nitrogen, and root-crop yields were low. Operations on experimental plots were mechanized as far as possible, and this year some of the long-term rotation experiments were combine-harvested for the first time. It is hoped that within a year or two even the Classical corn fields will be harvested in this manner. The experiments embraced most of the common farm crops, and an account of them is given in the report of the Field Plots Committee.

Cropping and Rotations

Of the 442 acres farmed, 368 were under arable crops, of which 237 were under tillage. The main tillage crops were wheat 70 acres, barley 82 acres, oats 9 acres, beans 15 acres, potatoes 27 acres, and kale, mangolds and sugar beet 19 acres.

The reservation of about eleven fields as sites deficient in phosphate or potash, the limitation of the potato acreage which can be grown as a cleaning crop and the necessity to provide sites for cereal experiments on land not having grown cereals for a number of years have resulted in a revision of the cropping programme. The acreage of wheat and barley was reduced by 20 acres, and the area under beans was slightly increased. A further increase in the bean acreage is planned for 1956, and the acreage under oats will be increased. On the reserved sites which are low in phosphate or potash, where it is useless to sow the normal cleaning crop of potatoes, bare fallowing may be used, though this is a retrograde step, and the use of short-term leys will be extended. Both these methods of cleaning reserved sites have already been put into effect.

Use of Sprays

A very full programme of spraying was carried out during the year, with very satisfactory results. Most of the cereal crops were sprayed with MCPA or DNOC, the latter spray being used mainly against cleavers (*Galium aparine*).

Several areas of land infested with couch grass (*Agropyrum repens*) were sprayed with TCA, and this resulted in a satisfactory reduction in the amount of couch grass present. Half of several plots in Barnfield, where mangolds are grown continuously, were sprayed as late as 9 April, and while the effect on the couch was satisfactory, there was no effect on the germination or growth of mangolds and sugar beet planted 2 weeks later.

The mangolds and sugar beet were severely attacked by the mangold fly (*Pegomyia betae*) when in a young stage, and all crops were sprayed with miscible DDT. This was effective in preventing further damage.

No spraying was needed this year against the flea beetle, nor were the beans sprayed, as the early infestation by bean aphis did not appear severe.

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Crops

Wheat

Very little winter-sown wheat was grown because of adverse conditions in the autumn. A few acres of Heine's VII, though sown in late December at a low seed rate, produced an extremely good level piece of wheat which yielded 40 cwt./acre. The Square-heads Master 13/4 grown on Broadbalk looked well throughout the year, and no lodging occurred. Small areas of Cappelle, Yeoman and Holdfast were also grown.

Koga II spring wheat was grown for the second year, and again gave an excellent yield on experimental plots and non-experimental areas. Yields of over 40 cwt./acre were obtained. Atle wheat was also grown, but was outyielded by the Koga II, which variety has now been accepted as the standard variety of spring wheat. All wheat crops stood perfectly.

Despite the double pulling of wild oats on Broadbalk field for several years, the field is still not clear of this weed. This hand-pulling must remain a standard practice, otherwise a rapid build-up is likely to occur.

Barley

Both Herta and Proctor were grown, and both varieties gave good crops, both as regards yield and quality of grain. No lodging took place, and the crops were easily dealt with at harvest-time.

Plumage Archer is still retained on experimental areas where continuity is required. On the Hoosfield Classical barley plots wild oats were again very numerous. As much hand-pulling as was possible was done, but the infestation was so heavy that large areas of many of the plots had to be cut green and carted off before the oat seed shed. Yield figures for these plots were taken from small areas from which the weeds had been pulled.

Oats

The variety Sun II was grown, and a good crop of approximately 27 cwt./acre was obtained. This was the only non-experimental crop to be cut by binder.

Beans

No winter beans were sown, but an increased acreage of spring beans were drilled by Smythe drill. Early growth was slow, but later the crop grew rapidly and promised a heavy yield. The cold weather in May and early June delayed flowering, while the very hot, dry weather in July brought flowering to a premature end. In addition, a late infestation of black fly (*Aphis fabae*) occurred when the crop was too far forward to permit spraying, and severe though localized damage occurred.

It was decided to try to harvest the crop by combine-harvester, and the most satisfactory method for a fairly ripe crop was to cut when the crop was damp and with the reel removed. Using this method losses appeared to be smaller than if a binder had been used.

Potatoes

The acreage of this crop was kept fairly low because difficulty was expected in obtaining suitable labour for lifting. The cold weather

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in early summer retarded growth, and later in the season the very hot, dry weather had the same effect. The crop remained backward throughout the growing period, and this poor growth is reflected in the yields, which were about half the normal. No spraying against late blight (*Phytophthora infestans*) was done except for experimental purposes, and no appreciable amount of disease developed. A small area of King Edward VII were grown, and these appeared less seriously affected by drought than the Majestics, and had considerably less scab. Local labour was available this year for picking, and this operation finished earlier than usual.

Sugar beet and mangolds

The area devoted to these crops was kept to a minimum owing to their heavy labour demands. After a slow start both crops were damaged by the mangold fly (*Pegomyia betae*) at an early stage, and they then suffered severely from the drought. Individual plants and total yield were small, and the sugar content of the beet was disappointingly low.

Kale

Three small separate areas were devoted to this crop, and on all three the plants lacked vigour and looked very parched and backward during the whole season. No trouble from flea beetle was encountered as the seed was treated with BHC.

Grassland

Growth of grass in the early part of the season was very slow, even where a nitrogenous top dressing was applied. It was not until well into May that real growth started. However, the cattle and sheep had just sufficient keep without having to open up any of the fields reserved for hay. Keep was adequate during the early summer months, but tended to fall off owing to the drought in August and September. Late autumn grass made some growth, and most of the stock remained out until well into December.

Haymaking was delayed until late June and early July because of slow growth and unsettled weather, but the crop was eventually secured in excellent condition.

Livestock

Cattle

In view of the high beef prices during the winter of 1954–55, the bigger cattle were pushed on as rapidly as possible in the yards, and 13 were sold during first 4 months of 1955.

The younger North Devon cattle purchased in the late autumn of 1954 were yarded during the winter and were fattened on the grass during the summer of 1955. In view of the shortage of grass we were fortunate not to have too many to fatten off.

During the year 44 cattle were sold fat, and 93 store cattle, mainly crossbred Herefords, were purchased. The smaller cattle were yarded early in the winter of 1955, but some of the larger ones were still grazing out at the end of the year. 52 of the cattle are in a temporary open yard adjoining some large stacks of old straw which they will tread into farmyard manure. They are being fed

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fairly liberally with a ration of home-grown feeding-stuffs with a view to having them fit for slaughter early in the summer. Hay, and oat straw *ad lib.* are being fed. It is hoped in this way to utilize profitably our rather large stocks of hay, straw and grain seconds.

Sheep

The small flock of Scotch Half-bred ewes was retained and was mated to Suffolk rams to produce tegs for grazing the experimental field plots.

From the 76 ewes put to the rams in 1954, 102 lambs were tailed. Some of these have been sold fat, the remainder are being retained.

Implements

Following upon the very successful experience in 1954 with a 10-foot self-propelled combine, both on experimental field plots and non-experimental areas, a second such machine was purchased in 1955. This enabled us to harvest in this way a far bigger proportion of plots than ever before, and again the technique used proved very satisfactory. The second machine, besides enabling one machine to be used for full-time work on experimental plots, speeded up work on non-experimental areas, and was always in reserve in case of mechanical breakdown of the machine on plot work.

Further progress was made towards standardization of equipment by the replacement of an old wheeled tractor of American manufacture by the type chosen as the standard heavy tractor for the farm.

A new mounted sprayer capable of being used for both high- and low-volume work was bought, and it worked very satisfactorily.

Several other new items of equipment were bought to replace outworn equipment.

Buildings

The buildings planned for 1955 and the grain-drying and storage bins did not materialize. However, plans are well forward, and it is hoped to put them into effect early in 1956.

Estate Work

The hedge-cutting machine purchased in 1954 enabled all the hedges to be cut in a few weeks in early winter. Some new fences have been erected, and other general work has been done.

About 60 trees were felled in the winter of 1955–56, of which about half were dead or dying, while the remainder formed obstacles or were shading important areas of arable land. A small programme for replanting odd pieces of land is being drawn up.

The well at the farm which supplies the farmstead and cottages, and most of the fields, showed signs of drying up; the existing water supply system has therefore been joined up to the mains water. The well water will be used when available; the mains water will only be used when the well is unable to meet our requirements.

Purchase of Land

Two orchards totalling about 26 acres adjoining the farm boundary came into our possession in October 1955. The orchards

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have been badly neglected, and are in a derelict state. A small part will be retained under fruit for observation by the scientific staff, but a start will be made with the grubbing up of the remaining area early in 1956.

Staff

Stephen Meyler, Deputy Farm Manager, resigned in January 1955 and was succeeded by M. J. Hill.

C. R. L. Scowen transferred from the farm staff to a post at the laboratories in April 1955.

H. P. Currant, a member of the farm staff since 1911, and farm foreman for many years, resigned in April 1955. W. A. H. Burton was appointed farm foreman in July 1955.

Woburn

The work of the Woburn Farm is directed and managed by the staff of the Rothamsted Farm. The field experiments are controlled by the Field Plots Committee, and the day-to-day planning is done by the bailiff at Woburn.

1955 was not a difficult year, but was disappointing in that all crops, except cereals, were adversely affected by the late, cold spring and subsequently by the severe summer drought. Crop yields are therefore well below average, and potato yields especially so.

The Effect of Weather on Crops

The very wet conditions in the early winter of 1954 resulted in all field work being far behind schedule by the beginning of 1955. In January and February only a very limited amount of field work was possible. However, by the end of March the ploughing was completed, and all the spring corn had been drilled by the end of the first week of April. The dry spell in April enabled good progress to be made, and by the end of the month all root crops were sown except for a few acres of potatoes, and other work was up to date.

The cold, wet weather in May delayed the germination of late spring seeds and retarded the growth of cereals and potatoes. The continuation of the wet spell into June made it difficult to keep clean the areas of sugar beet, kale and red beet, as the weeds took root again almost as soon as they were hoed up. The cereal crops improved wonderfully in late May and June, and looked very promising by the end of the month.

The hot, dry weather during July, August and part of September favoured the growth, ripening and harvesting of the cereal crops, but root crops suffered severely from the long-continued drought. This also delayed the transplanting of leeks, and made the ground so hard that the ploughing of stubbles was somewhat delayed.

October was much drier than usual, and the potato and sugar-beet crops were harvested under excellent conditions. During November and December the weather conditions favoured land work, and all ploughing was completed by the middle of December. By the end of the year land work was right up to schedule, a very different state of affairs from the previous year.