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Report for 1954

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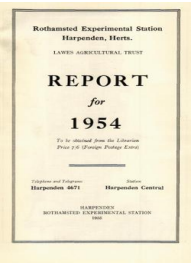
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J. R. Moffatt

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THE FARMS

J. R. Moffatt

Rothamsted

The year 1953–54 was a very difficult and disappointing one, mainly because of the very abnormal weather conditions, which caused serious difficulties which were hard to overcome. Yields of most crops suffered, and in many cases the quality was lowered. Each of the main harvesting operations was delayed and was spread over a much longer period than usual. This resulted in considerable overlapping of operations, which in the end upset plans for the autumn sowing of crops for the 1955 harvest. Very little winter corn was sown, and it was not possible to drill any winter beans. There will, therefore, be a big increase in the amount of work to be done in the spring of 1955.

The Effect of Weather on the Crops

The autumn of 1953 and early weeks of January 1954 were much drier and milder than usual; the harvesting of the root crops of the 1953 crops was greatly facilitated, and the winter ploughing for the 1954 crops suffered very little interruption. The mild weather resulted in a prolific germination of weed seeds on the fields which were ploughed early, and several were given a second ploughing.

There was a spell of very hard weather in late January and early February, and for about two weeks the maximum air temperature seldom rose above freezing point. Fortunately, land work was well forward by this time, and little inconvenience was caused. After this spell, weather remained generally mild and wet for the rest of February and early March. This caused the spring sowing season to have a rather late start, but seedbed preparations started about the middle of March, and drilling was completed by the end of the month. The drilling of barley on the Hoosfield permanent barley plots and spring wheat on a non-experimental field was delayed in order to get a good germination of wild oats which could be destroyed before drilling. In this we were successful, but in both cases there was still a heavy infestation in the corn crop.

The month of April was very dry, and the preparation of seedbeds for the root crops and the drilling of these crops was carried out without interruption. By the end of the month drought conditions prevailed, and potato tubers were planted in very dry soil. The dry weather continued until early May and seriously delayed the germination of the root crops, which was very uneven, and subsequent growth was very slow. The potato shoots took a long time to appear above ground, and were far more irregular than usual, and the subsequent plants were less bushy. However, the rate of growth improved later in May after rain had fallen.

There followed a prolonged spell of cold, wet, sunless weather covering the summer months of June, July and August. Rainfall was over 1 inch above normal in each of these months, and there was

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a total deficit of almost 180 hours sunshine. Much of the hay crop was ruined, much of the corn became badly lodged and ripening was considerably delayed; growth of the root crops also appeared to be retarded by the lack of sun.

The corn harvest commenced on 26 August, about three weeks later than usual, and became an extremely slow and protracted operation which lasted until about the middle of October. As much as possible of the corn was cut by combine-harvester, but as practically all the combined corn needed immediate drying, the rate of work was restricted to the throughput of the platform drier. Binders were used on some of the upstanding crops, but many of the fields could only be dealt with by combine-harvesters, as early lodging had enabled weeds to grow through the crops, and this greatly complicated the harvesting and drying operations. The straw from the combine was baled and carted in, but some fields have yet to be cleared. Much of it would have been burned on the field, except that this would spoil the uniformity of the fields and render them useless for experimental work for some years.

September and October were comparatively dry months, but even so the rainfall was spread over 20 days of each month. Because of the impossibility of recruiting outside assistance for the potato harvest, we had to rely on schoolchildren working on Saturdays, and in order to get the crop in while soil conditions were reasonable, lifting started before the corn harvest was completed. The work was therefore spread over several weeks, and was not completed until the middle of November.

The very late corn harvest and its consequent overlapping with the potato harvest delayed other autumn land work. Only small experimental areas could be ploughed during October, but many of the winter corn experiments were drilled before the end of the month. It was hoped to complete the winter corn and bean drilling early in November, but adverse weather conditions made this impossible. Rainfall in November totalled 5·31 inches, nearly twice the average, and the ground became waterlogged. Practically no land work was possible during the month, and no drilling was attempted.

December brought an improvement in the weather, and it was possible to continue the drilling of the winter corn during the second week of the month, though soil conditions were far from ideal. Broadbalk field was sown during this spell. After a short wet spell the weather greatly improved, and there was a dry and mild spell. Some few further areas of non-experimental winter corn were sown just before Christmas, and ploughing was pushed on. Good progress had been made by the end of the year, but much ploughing remained to be done in the new year.

Field Experiments

The number of field experiments remained about the same as in the previous year, but despite the adverse weather the programme was not so difficult to execute as in some previous seasons. This was due to the fact that the dry weather in the latter half of March and April enabled the spring sowing to be carried out without interruption, and the use of the combine-harvester on the cereal

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plots greatly facilitated and expedited this work. Had we not had this combine, it is doubtful whether all the plots would have been harvested. Certainly the harvest period would have been considerably lengthened, and it would have clashed severely with the harvesting of the root crops. The use of the pick-up baler on the hay plots enabled this work to be carried out expeditiously, and the mounted elevator-type potato digger accelerated the harvesting of the potato plots. Next year it is hoped to deal with the experimental green crops by baling and making into silage, instead of manhandling them all, as is the present practice. However, even with these mechanical aids the programme could not have been carried out without the willing co-operation of all members of the farm staff, who put in long hours of work when conditions allowed. The experiments embraced most farm crops, and an account of them is given in the report of the Field Plots Committee.

Cropping and Rotations

Of the 442 acres which were farmed, 368 were under arable crops, of which about 256 acres were under tillage crops and 112 acres under leys of varying duration. There is still a considerable area of old grassland, much of it unploughable because of tree-stumps, but some is under experiments or is reserved as sites for future experiments. The main tillage crops were wheat 88 acres, barley 85 acres, oats 10 acres, potatoes 25 acres, kale, mangolds and sugar beet 20 acres, and beans 9 acres, while about 12 acres were under fallow or used as headlands on experiments.

The acreage under the various crops was not changed much from previous years, but the area under potatoes was kept as low as possible because of the difficulty in obtaining seasonal labour for lifting. Potatoes are the main cleaning crop of the arable rotation, and the reduction in the acreage may lead to a revision of the cropping scheme. This reduction has brought about further difficulties in that the area of land following a crop other than cereals, which is often required for cereal experiments, is greatly reduced, and suitable sites are more difficult to find. To overcome this difficulty it is proposed in future to extend the area under beans, which crop can be used on the farm or sold. The increase in knowledge of spraying against bean aphis in recent years has made this a far more certain crop than it was. The emphasis is likely to be on spring beans rather than winter beans, because with a very full autumn programme of work it is seldom possible to get the beans sown early enough, the possible loss of plant due to bad weather is eliminated and there is more time in which to clean the land.

Another development which will call for a revised crop rotation has been the scheduling of about eleven fields as sites deficient in phosphate or potash, to which these fertilizers cannot be applied except on experiments. Potatoes cannot be grown as a cleaning crop, as it would be useless to grow this crop without these fertilizers. For the same reason most other cleaning crops are ruled out, and the only effective means of cleaning these areas will be by bare fallow or by the use of short-term leys. Two of these scheduled fields were undersown in 1954 with a 2-year hay or silage mixture.

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Use of Sprays

A rather ambitious scheme of spraying against weeds in cereal crops was severely curtailed by the unsuitable weather, which in many instances prevented spraying until the crops were too high for it. However, several fields were sprayed with DNOC mainly against cleavers (*Galium aparine*), or with MCPA against a wider range of weeds which did not include cleavers.

Some preliminary trials with TCA against couch grass (*Agropyrum repens*) were carried out on the headlands of some of the fields, and the results were encouraging. This autumn, therefore, a more ambitious scheme was put into operation in an attempt to clear two fields where the infestation was getting serious. One spraying was done in December, after which the land was cultivated, and another spraying will be done in January if weather conditions permit. Both fields will be cropped with potatoes in 1955.

Crops

Wheat

Of the 88 acres under this crop 72 acres were winter sown and 16 spring sown. Cappelle held pride of place with 56 acres, but a small area of Holdfast was grown for the first time. No lodging occurred in either of these varieties, and most of the fields promise satisfactory yields. They were mostly cut by binder so that the combines could tackle the laid crops. The Holdfast showed some signs of sprouting in the ear before cutting was done, but a nice sample of wheat was obtained. Squareheads Master 13/4 was grown on the classical plots, and on Broadbalk lodging was severe. Yeoman was grown on the long-term rotation experiments. There was little evidence of wheat bulb fly damage on any of the fields.

One piece of Atle wheat was very badly lodged early in the season. Weeds grew up through the crop, and though it was combined, losses were fairly heavy. The grain was badly shrivelled. Another area of the same variety did better, but the small area of Koga II spring wheat grown on an experiment did extremely well. It stood perfectly and gave a heavy yield; the area of this variety will be considerably increased in future.

The infestation of wild oats on Broadbalk field has now been practically eliminated by thorough hand-pulling twice a year for many years.

Barley

Plumage Archer has been replaced by Proctor or Herta barley on all except experimental plots and blanket areas, and many of these were laid. Herta was grown on the richer fields, and though only a modest amount of nitrogen was used, much of the crop was badly laid early on, and a lot of chickweed grew through it, making harvesting a very slow and tedious job. Proctor occupied the biggest acreage. Some areas of this variety stood well, while others were badly lodged, but all the grain not required for sowing ourselves has been sold for seed.

An intensified attack was made during the summer on the wild oats on the Hoosfield barley plots, and all except a few bad patches

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were pulled by hand. These bad patches were cut and carted off before the oats seeded.

Oats

The Dutch variety Marne, which yielded so well with us in the last 2 years, was again grown. However, as in 1953, the crop was badly lodged early in the season. It was, however, cut very successfully by the combine, and yielded reasonably well. In future years a rather stiffer-strawed variety will be grown.

Beans

A small area of non-experimental winter beans was drilled, mainly to reduce the possibility of bird damage to adjoining experimental plots. However, the spell of very severe weather during the winter killed off a fair proportion of the plants in one field, and so after a fair seedbed had been prepared by the use of a mechanical weeder, barley was drilled between the rows. This made rather slow growth and had to compete with a rather heavy infestation of black bent (*Alopecurus agrestis*). The beans suffered badly from an attack by bean aphis, so that the resulting crop was very disappointing. The area of spring beans was restricted to experimental plots.

Potatoes

As has been mentioned already, the potato acreage was kept low because of difficulties at lifting time. The year was a very disappointing one for the crop, and the plants never looked really vigorous. This is reflected in the yields, which were several tons per acre below the 1953 yields. As in the past, only one variety, Majestic, was grown, and stock seed was used on all areas.

Planting was done, mainly by a dropper, in good time, but the ground was extremely dry, and this had a very detrimental effect on early growth. During the early summer the cultivations were frequently delayed or prevented by unsuitable soil or weather conditions, and the crops were therefore more weedy than usual. The weather was very suitable for the spread of Late Blight, and two sprayings were done to prevent this. The haulm was later burnt off with acid, which also reduced the weeds. There were few diseased tubers, and the crop is keeping well in the barn at the farmstead. Very few have been sorted so far, but the whole crop has been sold to one firm.

Sugar beet and mangolds

Only the minimum area required for experimental plots was given to these crops owing to their heavy labour demands and the great difficulty in getting them off our heavy land in late autumn. In the early stages the plants were very slow and irregular in growth, and singling was complicated. Subsequent growth seemed slow, and this was probably due to the lack of sunshine. There were rather more bolters than usual in the sugar beet crop, and both yields of beet and sugar content were disappointingly low.

The mangold crop in Barnfield was far cleaner than usual, as owing to the weather in early August preventing any harvest work, the mangolds were given a second hand-hoeing. Yields were lower

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than usual, despite the fact that sowing was done earlier than normally.

Both sugar beet and mangolds suffered from an attack by the mangold fly (*Pegomyia betae*) early in the season, and spraying was necessary to prevent the damage reaching serious proportions.

Kale

This is about the only crop which seemed to benefit from the wet season. The seedlings received no check from flea-beetle attack, as some of the seed was dressed against this pest, and an early preventive spraying with miscible DDT was given. The crop made rapid growth throughout the summer. Weed control was made difficult by the wet weather, which enabled many of the weeds to take root again after being horse or tractor hoed, but they were soon smothered by the rapidly growing plant of kale. The crop is now being cut and carted to livestock, and the yield is very heavy.

Grassland

There was very little grass in the early part of the season, as growth was severely retarded by the long spell of cold, dry weather with very low night temperatures during April. The grazing season therefore started very much later than usual, and the normal spring flush was absent this year. However, the grass made better growth in the warmer, damper weather in May, and subsequently maintained good growth throughout the season.

The hay season was the worst for many years. Early growth was very slow, but, as the consistently wet weather prevented any hay being cut until late June, the crop was able to bulk up later. Unfortunately the persistent dull, wet weather made it very difficult to save the crop in anything approaching good condition. Such hay as it was, was baled and eventually carted in. One field of 12 acres was turned so many times, and became so leached and brittle, that it was worthless, and was eventually burnt. Fortunately there was a good stock of hay left from the previous year.

Livestock

Cattle

The policy was continued of buying in young store cattle, wintering them in yards to make farmyard manure, and fattening them from the grass during the summer and autumn. Both Devon and Hereford-cross cattle were used, but because of the late grazing season, most of them were not ready until late autumn.

Sheep

The old ewe flock was sold in 1953 and was replaced by a smaller flock of eighty Scotch Half-bred gimmers. A flock of this size very comfortably provides the requirement of tegs for grazing the experimental field plots. The 1954 lambing season was not very productive, only 110 lambs being tailed from the 80 ewes put to the tups.

Implements

The main purchase during the year was a 10-ft. self-propelled combine, primarily for work on the experimental field plots. This

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worked very satisfactorily on both standing and laid crops, and enabled crops to be gathered which would otherwise have been written off as lost.

A tractor-mounted elevator potato digger was bought for use on experimental field plots, and after some initial difficulties, worked satisfactorily. The blade of the machine got under the first few plants in the plot rows more easily than did a similar trailed model, and turning time on headlands of these small areas was greatly reduced.

Several different types of mechanical hedge cutters were tried out during the year, the most satisfactory one being a tractor-mounted machine driven by an auxiliary engine, which needs a man to guide the knife. One of these machines was bought, and in addition to hedge cutting was used to cut kale for carting to stock.

Woburn

The Woburn Farm was directed and managed by the staff of the Rothamsted Farm, but the day-to-day work was planned by the bailiff at Woburn.

1954 was a very difficult year because of the very adverse weather conditions, but the full programme of work was successfully carried out. The effect of the cold, wet summer was less marked on the light land at Woburn than it was at Rothamsted, the main effects being on the root crops, where yields were reduced.

Of the 127 acres farmed, 24 acres were under wheat, 37 under barley and 21 under potatoes. One small piece (4 acres) of old permanent grassland was ploughed up and cropped with barley.

Continuing with the policy of bringing all the non-experimental land at Woburn up to a pH of about 6·5, another 22 acres were given an application of ground chalk at rates varying between 1 and 3 tons/acre.

The usual classical wheat and barley plots were continued, as were the long-term rotation experiments. Two of these latter, the Green Manuring Experiment and the Irrigation Experiment, underwent a radical revision, and an account of the changes made is given elsewhere. The winter cabbage crop, which needs a lot of labour for planting out and cutting, was eliminated from each of these experiments, and this considerably eased the pressure of work.

The programme of experimental field work was expanded this year to include a short-term experiment on winter wheat. There can be very little further expansion of cereal experiments at Woburn because of the difficulty in handling any more plots at harvest-time, unless the new technique involving the use of the combine-harvester is adopted. It is hoped that a self-propelled combine, which can be shared between the Rothamsted and Woburn farms, can be bought for the 1955 harvest. A considerable increase in the number of cereal plots will then be possible. This year the plots were threshed by the small drum, which was converted into a high-speed machine for this purpose. The main advantage of having this machine permanently at Woburn is that the work can be spread over a longer time and can be done when outside work is not possible.

Weather during the autumn of 1953 and most of January 1954 was very favourable to farm work. This mild, dry spell enabled the