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### The Farms : Rothamsted

**J. R. Moffatt**

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## THE FARMS

J. R. MOFFATT

### Rothamsted

The weather during 1958 was most unusual, and for farming almost disastrous. The year began well after a mild and dry autumn in 1957, and by the beginning of 1958 land work was well ahead; but wet spells, followed by heavy falls of snow early in 1958, delayed seedbed preparations, and what promised to be an early season turned out to be a late one. However, a mainly dry spring helped the sowing, which was completed by early May. All crops made good growth and looked well in the early part of the summer, but a very wet June interrupted all farm work. Much hay was spoilt and some cereals lodged early. The wet, sunless conditions throughout the summer caused severe lodging in cereals, and hopes of a bumper corn harvest were dashed; in fact, the harvest was almost a salvage operation. Root crops grew well, but their lifting was tedious and difficult. The weather remained mild and damp, with the soil very wet throughout the autumn and early winter, so the land ploughed up badly and seedbeds were difficult to obtain. Autumn ploughing and drilling were greatly delayed, little winter corn was sown, and land work has seldom been so much in arrears as it was at the end of 1958.

### THE EFFECT OF WEATHER ON CROPS

All the winter-sown cereals and beans for the 1958 crop started well, as the dry autumn enabled the drilling to be done earlier than usual. Farmyard manure from open yards was carted and spread, and the ploughing soon followed. All the arable fields, except a small area where the beet tops were lying, were ploughed before the end of 1957.

During January and February, mild spells alternated with shorter spells of hard frosts, but a blizzard towards the end of February caused deep drifts of snow.

The ground remained wet, and little land work was possible until mid-March; then for about two months the weather favoured farm work. All spring cereals and beans went in under good conditions, and the tilths for most of the root crops were the best for many years. The germination of all crops was delayed by cold weather, and the winds caused the winter wheat and the grassland to lose their fresh green colour; but in a warmer spell during the latter half of April and early May all crops, including grass, grew rapidly.

By mid-June all crops looked promising, and weeds were under control. Very heavy rain in the latter half of the month affected all farm operations, particularly those to the potato crop. The hay crop was badly damaged, and weeds, particularly in the kale and



potatoes, outstripped the mechanical cultivations. Cereal crops were not much harmed, though there was some lodging of barley and of a few small areas of winter wheat.

The wet, sunless weather persisted until the end of the year, and all operations were much retarded. Most cereal crops became badly lodged, and the start of harvest was delayed until almost the end of August. Much of the corn was combined with a moisture content of about 25 per cent or even above. This greatly strained the drying plant, and much of the corn had to be partially dried and brought back for further drying after harvest. Fair progress was made with the harvesting, but the cereal harvest dragged on until the end of September and the bean harvest until mid-October. Most of the straw was eventually baled, but some had to be ploughed in.

Potato lifting started before the cereal harvest was finished, as this was possible when harvesting was not. When conditions made this work impossible, mangolds were harvested. The lifting of potatoes, mangolds and sugar beet alternated throughout November according to soil conditions, and all work was completed early in December.

Ploughing was done whenever soil conditions permitted, but the land ploughed badly because of the compaction at harvest, and conditions were seldom suitable for working it down. A small area of winter beans was drilled, but very little winter wheat could be sown, and Broadbalk field was not drilled until the second week of December. This month was mostly damp, with widespread and persistent mist or fog.

The ground has remained very wet and intractable throughout the autumn, and field work is much behind schedule. The drilling of winter corn, in particular, is seriously in arrears, and that which has been sown went in under unfavourable conditions.

#### FIELD EXPERIMENTS

The suitable soil and weather conditions in the autumn of 1957 and the spring of 1958 enabled a large programme of field experiments to be sown satisfactorily. At harvest many of the plots were badly laid. However, it was possible to harvest most of them with the combine-harvester, although many had almost been given up as ruined. The wheat on the Six-Course Rotation experiment was too badly lodged even for the combine-harvester, and yields were obtained from small sample strips on each plot. Many of the results will conflict with those obtained under normal conditions, for the general rule this year seemed to be that the better the manuring, the worse the lodging and the lower the yield.

The combining of the classical wheat plots on Broadbalk field in 1957 proved satisfactory, and this has now become the recognized method of harvesting. In 1958, for the first time, the classical barley plots on Hoosfield were cut in the same way. On both fields lodging was severe. The wild oats on these fields were again pulled twice. In Hoosfield, this, together with late sowing following cultivations to encourage the germination and the subsequent destruction of wild oat seedlings, has strikingly decreased the population. However, there was much coltsfoot (*Tussilago farfara*) and



sow thistle (*Sonchus arvensis*). An ester formulation of 2:4-D at treble normal strength was applied shortly after harvest and killed the leaves and crowns well. Whether it had any effect on the extensive root system remains to be seen.

The sugar beet and mangolds on Barnfield gave the heaviest yields for many years. The weather was the chief cause of this, but the fact that a good surface tilth was maintained helped rapid and even germination. Singling started under good conditions, which, however, became worse before it was finished. Plants were thinned by hand when it was too wet to hoe.

Trouble caused on the Park Grass plots by moles throwing up many hills was overcome by using poison bait. The first cut, though made late, produced its best hay for some years. The second cut was delayed until late December 1958. Conditions were bad, and some damage was done by the passage of the implements.

#### CROPPING AND ROTATIONS

The acreage farmed during 1958 was increased to 460 acres by the addition of 18 acres of old orchard which were cleared and ploughed. Of this total 66 were under permanent grass, 133 under short-term leys and clover or lucerne, and 269 under arable crops. These were 93 acres of wheat, 36 acres of barley, 6 acres of oats, 33 acres of beans, 32 acres of potatoes, 4 of sugar beet, and 15 of kale and mangolds.

A good deal of land low in phosphate or potash is reserved for experiments with these materials, and only a few crops are worth growing under these "famine" conditions. Moreover, many experiments now require sites on which specific crops have, or have not, been grown in the previous year. The provision and choice of suitable sites and the preparation of a cropping schedule have become very difficult. The acreage under cereals has therefore been reduced, and that under beans increased to the maximum that can be conveniently handled. The introduction of a lucerne-grass mixture, sown in alternate rows, was successful; this is another crop that can be used to prevent too frequent cropping by cereals. The acreage of root crops has already reached the maximum that can be dealt with.

#### CROPS

##### *Cereals*

All cereal crops looked very well by mid-June, when many were coming into ear. Slight lodging occurred later that month, but the heavy rainstorms during July and August caused the spring oats, and much of the barley and winter wheat, to lodge badly. The spring wheat stood very well. The lodged crops sprouted, and quality generally was poor.

Hormone weedkillers were used extensively, CMPP taking the place of DNOC against weeds such as cleavers (*Galium aparine*) and chickweed (*Stellaria media*). Control was good in the early stages, but fresh growth occurred later, and some crops were very weedy



at harvest. Bindweed (*Convolvulus arvensis*) and chickweed (*Stellaria media*) grew especially vigorously, the former overtopping the cereals in several fields, and the latter spread rapidly over the badly laid crops. This delayed the start of daily operations and resulted in a mass of green material and weed seeds coming in with the corn.

There was much take-all (*Ophiobolus graminis*), especially on crops where wheat or barley had been taken recently.

Cappelle Desprez was the main winter variety grown, but one area of Leda stood and yielded well. Proctor and Herta were the main barley varieties, and Sun II the main oat variety. With all crops the early promise of heavy yields was not fulfilled; but they were better than seemed possible at the start of harvest.

### Beans

Only a small acreage of winter beans was sown, but good weather enabled them to be drilled early. There was some frost damage, but the plant recovered and grew well in spring. However, chocolate spot disease (*Botrytis cinerea*), which is rarely severe at Rothamsted, appeared early and spread rapidly. Severe lodging also occurred, and what promised to be an excellent crop became a poor one.

In the wet season the spring tick beans made too much vegetative growth, but fortunately the black aphid (*Aphis fabae*) attack was slight because the soil and weather conditions at the time when the crops should have been sprayed made this operation impossible.

Under these exceptional conditions the tick beans outyielded the winter strain in the experiment comparing the two. The bean weevil (*Sitona lincata*) was present, but the attack did not require control.

### Potatoes

The variety Majestic occupied most of the acreage, with smaller areas under Arran Pilot, King Edward VII and Ulster Supreme. As usual, the whole area was planted with Stock Seed, which went in under quite good conditions. The mechanical cultivations were interrupted by the condition of the ground, and the final earthing up damaged the haulm, despite the use of wheel guards. The lack of cultivations soon showed in the weediness of the fields. Fat hen (*Chenopodium album*) and fumitory (*Fumaria officinalis*) were widespread. Patches of couch grass (*Agropyrum repens*) were sprayed with TCA after lifting, when the stolons were exposed. Late blight (*Phytophthora infestans*) appeared early, but its spread was delayed by repeated applications of copper and dithane fungicides.

Good growth was maintained throughout the season, but the haulm began to turn yellow and die off earlier than usual. After burning off with sulphuric acid the stems of the fat hen (*Chenopodium album*), which would otherwise have impeded lifting, were cut by a machine fitted with horizontally rotating chains.

Lifting was spread over 2½ months because of bad soil conditions, and many of the tubers brought in much soil. Yields were rather lower than usual. The Majestic and Ulster Supreme tubers were almost free from blight damage, but the King Edward were badly affected, and most of this variety was sold off the field. The Ulster



Supremes bruised less readily than in 1957, perhaps because of the longer growing season allowed to the 1958 crop.

#### *Kale and sugar beet*

The wet season suited both these crops. An even and regular plant was secured and pests caused little trouble. The mangold fly (*Pegomyia betae*) threatened the beet plants about mid-summer, but a spraying with "Metasystox" controlled this and the slight aphid attack. Constant hand work kept this crop clean, but the kale became very weedy. The sugar beet maintained their growth into the late autumn, and both yield and sugar content were high. Kale also gave a high yield.

#### *Grassland*

The early growth of grass was retarded by cold winds until the end of April. When warmer weather came the grass grew rapidly, and for the rest of the year there was an abundance.

The crops for hay were heavy, but cutting was delayed, and some of the crops became rather mature. Much of that cut early was ruined and is only fit for litter, but some of the later-cut crops produced good hay.

In late summer the growth outstripped the needs of the livestock, and the surplus grass was made into silage.

Verticillium wilt attacked both the lucerne-cocksfoot ley, which may have to be ploughed up in 1959, and some of the lucerne plots in the ley-arable experiments.

### LIVESTOCK

#### *Cattle*

As usual, store cattle of about 18 months old were bought in the autumn and winter, and fattened during the following summer and autumn. To this end some 80 Hereford cattle, mainly bullocks, were bought in 1957-58 and outwintered. Some were folded for a time on kale, while others grazed the lucerne-cocksfoot mixture. Hay and a small ration of home-produced concentrate feed was given to all of them. Because grass was scarce full winter rations had to be fed until the end of April. From that time grass was very plentiful—perhaps too lush, as the cattle did not thrive as well as was expected. Very few were fat by the early autumn and feeding of hay, and folding on kale, was started in November. Concentrates were also fed to the more forward beasts to speed their departure to the butcher. The remainder were brought into covered yards about mid-December and fed on silage.

Sixty more bullocks were bought in December 1958 and kept outside, but they are so churning up the wet fields that they will soon be brought into an open yard.

#### *Sheep*

The last ewes of the old Scottish Half-bred flock were mated in October 1957 with Suffolk rams to produce lambs to be used on grazing experiments. Thirty-two home-bred gimmers of this cross were also mated to these rams. The lambing was satisfactory, the



old ewes giving a lambing percentage of 174, and the gimmers 131. The gimmers were sold in the spring with lambs at foot. After the lambs had been weaned from the old ewes, the ewes were sold as they became fat. They have been replaced by a new flock of 100 Scotch Half-bred gimmers, which have been mated to Suffolk rams this autumn.

#### EQUIPMENT

Normal replacements accounted for most of the expenditure under this heading, but a concrete-sided silo was erected under the existing barns and filled with new buckrakes.

The platform drier, which was moved in 1957 and re-erected adjoining the circular drying silos of the main grain drying plant, was fitted with its own fan and heaters. A second corn elevator was added to this plant to enable the seed cleaner to be used as a pre-cleaner. This effectively removed the green material and sprouted grain which would otherwise have prolonged the drying operations.

#### ESTATE WORK

The amount of work involved in the clearing of the derelict orchard in Whittlocks field, bought in 1955, prevented much other estate work. About 75,000 cordon trees and many miles of supporting wire were removed. The land was then ploughed deeply and fallowed for the rest of the year. The field was very foul, and was sprayed in the late autumn with "Dalapon" to kill the couch grass, and also with MCPA.

#### STAFF

J. Hart was appointed Recorder in February 1958.

F. Stokes retired in June 1958 from the position of horseman after almost 30 years of unbroken service.

#### Woburn

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

The unusual weather of 1958 did not affect the crops in the same way as at Rothamsted. The start of land work in the spring was delayed, but all crops grew well in early summer. Most of the barley became lodged shortly before harvest, but the yield of grain was not greatly affected. There was no lodging on either the winter- or the spring-sown wheat, and yields were better than usual. Sugar beet yielded well, and sugar content was high. Beans and potatoes were poor. The King Edward potatoes had a very early and severe attack of Late Blight (*Phytophthora infestans*), which killed the crop before much tuber growth had been made. Autumn land work was held up by the wet weather, and much ploughing remained to be done at the end of the year.

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