

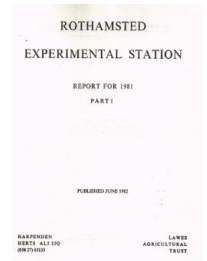
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# Report for 1981 - Part 1

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## The Farms

### R. Moffitt

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## THE FARMS

R. MOFFITT

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### Rothamsted and Woburn

#### General

The season was varied and at times difficult. February was dry and field work began but the weather then became wet and many crops were planted late. However, there was adequate moisture during the rather dull summer and crops generally grew well.

A favourable August helped the cereal harvest but potato lifting and autumn sowings were hindered by wet weather in September and October. However, all were completed by early November.

An exceptionally cold spell in December brought field work to a halt and some ploughing remained to be done at the year's end. Some fertilisers had still to be applied to classical experiments.

#### Weather

January was drier than average and at Rothamsted only 31 mm of rain fell, although there was slightly more at Woburn. There were 20 ground frosts. Ploughing of stubbles was completed.

February was also dry although slightly colder than average and there were 23 ground frosts. Rainfall was only 19 mm, 30 mm less than average and it was possible to start field work. Some winter barley was given an initial top dressing and a start was made sowing beans and barley. However, frost and snow on 20/21 February stopped work and apart from a little drilling on the lighter land at Woburn nothing further was done during an exceptionally wet March. Rainfall was 123 mm, 74 mm above average and 28 rainy days were recorded.

April was better; 49 mm of rain were recorded, about average. Field work started again on 6 April, sowing of spring cereals was completed and all winter cereals were top dressed with nitrogen. A start was made planting potatoes.

May was dull and wet, 86 mm of rain fell at Rothamsted, 32 mm above average and



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there were 20 rainy days. Woburn however was drier with 63 mm, only slightly above average. Potato planting was completed and cereals were sprayed with herbicide. Unlike the very dry late April and May of 1980 the weather was much more favourable for crops, particularly on the light land at Woburn.

June was drier but dull. Thirty-five millimetres of rain fell, 20 mm less than average, and a similar amount fell at Woburn. Silage and hay were made and some potatoes were irrigated. There was much leaf disease in cereal crops. July was also dull with 65 mm of rain, about average. There was a fine spell at the end of the month and harvesting of winter barleys began.

August was unsettled at first but the latter half of the month was dry and sunny and the cereal harvest continued in easy conditions. Total rainfall for the month was 44 mm, 20 mm less than average. Harvest of cereals was finished on 5 September. The weather then deteriorated and at Rothamsted 99 mm of rain fell, 38 mm above average although Woburn was drier, 71 mm being recorded. Seed potatoes were lifted and early sowings of wheat and barley experiments were completed. Winter bean experiments and most winter barleys were sown.

October was difficult. Although at Rothamsted rainfall was only 4 mm above average with 78 mm being recorded, temperatures were below average and the soil already made wet by the September rain only dried a little. At Woburn rainfall was 79 mm, 25 mm above average. Consequently harvesting of potatoes was difficult and later autumn sowings were done in less than ideal conditions.

Early November saw some improvement in weather and drilling of autumn cereals was finished at Rothamsted on 2 November and Woburn on 13 November. A final cut was taken from grass experiments. Rainfall for the month was 44 mm at Rothamsted, 21 mm less than average, and 33 mm at Woburn, 29 mm less than average. In December there was a prolonged spell of cold weather with snow which began on 7 December and continued until 27 December. The coldest temperature recorded was  $-17^{\circ}\text{C}$  at Rothamsted and  $-15.2^{\circ}\text{C}$  at Woburn on 13 December. This halted field work and consequently some ploughing remained to be done at the end of the year.

### Field experiments

There were 5941 plots managed by the farm and yields were taken from 5056. In addition there were 660 large plots and 2684 microplots managed by departments on which several operations were done by farm staff.

For some years there has been a large autumn-sown programme and this continued in 1981. After a run of favourable seasons the 1981 autumn was difficult but all cereals and beans were eventually sown.

The Broadbalk 1981 wheat crop was sown on one of the earliest recorded dates, 1 October. There was much disease and it was sprayed twice with a mixture of prochloraz, maneb and zineb, but despite this mildew was prevalent. Yields compared favourably with 1980. The best plot on Section O, the 30th consecutive crop, yielded  $8.47\text{ t ha}^{-1}$  compared with a yield from the 29th consecutive crop on the same section of  $8.8\text{ t ha}^{-1}$  in 1980. The best first wheat gave  $8.64\text{ t ha}^{-1}$  compared with  $8.8\text{ t ha}^{-1}$  in 1980.

The 1982 crop was sown on 14 October and although now outyielded by newer varieties, Flanders was retained to maintain continuity.

Hoosfield Continuous Barley was sown on 17 February during the first fine spell of the spring. The variety was Georgie and the best plot yielded  $6.12\text{ t ha}^{-1}$ .

The cultivation weedkiller experiment was sown to winter barley. It gave a mean yield of  $6.22\text{ t ha}^{-1}$  of Igri. There was little difference between yields of ploughed, rotadug, chisel ploughed or direct drilled plots.



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The investigation into the causes of variation in yields of wheat and barley was extended. Sites were prepared in 1981 to give a wider variety of previous crops than in earlier years and consequently the 1982 autumn programme was larger.

Experiments on cereal diseases and pests requiring large uniform sites or isolation from other experiments continue to be a feature of the programme. The increase in the arable acreage and lessening of grass has been invaluable in meeting these needs and there is now very little land left in grass which is useful experimentally.

### Crops

Of the 338 ha farmed (262 ha at Rothamsted and 76 ha at Woburn), cereal crops occupied 213.6 ha, potatoes 18.9 ha and beans 13.8 ha. There were 72 ha of grass and small areas of oilseed rape, maize and peas. The remainder was fallow or used as headlands for access to field experiments.

**Wheat.** There were 55.9 ha at Rothamsted and 19 ha at Woburn, all winter sown. Flanders occupied most of the area but some Avalon and Brigand were grown. A little Hustler was retained for continuity on certain experiments.

Generally sown in good time it survived the winter well. Autumn herbicides gave good control of weeds and this was fortunate as herbicide application in the wet spring which followed would have been difficult. Except where times of applying nitrogen were being tested all wheat was top dressed with 'Nitro-Chalk' in mid-April. However, wheel damage was considerable and for the 1982 season plot layouts have been altered to fit a 12 m fertiliser spreader. By including spray paths in new experiments this will eliminate wheelings on plot areas, although this is not possible on old long-term experiments where dimensions are already fixed.

No wild oat spraying was done and little hand roguing was required.

Generally yields were less than in 1980, only the better crops gave field yields of 7.5 t ha<sup>-1</sup> whilst this was exceeded more frequently last year. The protein content of the grain was also lower.

There was much leaf disease particularly mildew, Flanders suffering badly despite spraying twice with prochloraz + maneb + zineb.

There were few aphids however and aphicide sprays were unnecessary. One field at Woburn suffered badly from barley yellow dwarf virus as did September sowings on some experiments where sowing date was tested.

In a repeat of the 1980 experiment testing factors affecting yield, Hustler gave a mean yield of 8.29 t ha<sup>-1</sup> compared with 9.61 t ha<sup>-1</sup> in 1980. There was a slight benefit from mid-September sowing and a slight loss from irrigation. Nitrogen timing had little effect but increasing the rate of nitrogen from 80 to 150 kg ha<sup>-1</sup> lessened yield slightly. The use of a fungicide increased mean yields from 7.45 to 9.12 t ha<sup>-1</sup>. In 1980 plots treated with fungicide yielded 10.01 t ha<sup>-1</sup>.

The season generally suited the light land at Woburn and a similar experiment, when treated with fungicide, yielded 8.62 t ha<sup>-1</sup> compared with 8.52 t ha<sup>-1</sup> in 1980.

In the variety experiments best yields were on a site at Rothamsted following potatoes. The best yield was 10.58 t ha<sup>-1</sup> of Norman when treated with growth regulator, fungicide and 189 kg N ha<sup>-1</sup>. Fenman and Avalon similarly treated yielded 10.17 and 9.91 t ha<sup>-1</sup> respectively. Flanders did less well, the best plot yielding 8.81 t ha<sup>-1</sup>.

Sowing conditions for the 1982 crop were not good but all planned experiments as well as farm crops were sown by early November. Since much wheat follows potatoes or beans, fertiliser will in future not be applied following these crops. Where following a cereal, fertiliser will be broadcast before sowing. Soil reserves of phosphate and potassium



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will be maintained by the application of relatively large dressings elsewhere in the rotation. This enables grain-only drills to be used instead of combine drills and has made the autumn field programme easier. A change to wider metric drills enabling experimental plots to be drilled in one pass instead of two has also speeded work. For some experiments, linking a drill behind a rotary harrow so that drilling can be done direct on to ploughed or rough cultivated land has been of great benefit, particularly in the wet autumn of 1981.

For 1982 a change has been made to Avalon and Norman as the main varieties, Flanders being retained only on Broadbalk and certain experiments for continuity.

**Barley.** There were 99.5 ha at Rothamsted of which 39.9 ha were autumn sown. The corresponding values for Woburn were 20.6 and 6.2 ha. These represent an increase in total area and also in the proportion of winter barley compared with last year.

The main winter variety was Igri but a little Maris Otter and Athene were grown where required for particular experiments. Seed was dressed with either ethirimol or triadimenol to prevent mildew, and a fungicide spray was applied in spring. All crops were treated with a pre-emergent herbicide.

Field yields were less than in 1980. Most Igri yielded about 6.4 t ha<sup>-1</sup> compared with 7.4 t ha<sup>-1</sup> in 1980 but a field of Athene on the light land at Woburn was poor. On the cultivation experiment at Woburn, plots grown without fungicide and with normal amounts of N yielded 7.2 t ha<sup>-1</sup>. Extra nitrogen (total 225 kg ha<sup>-1</sup>) and fungicides increased yields to 8.33 t ha<sup>-1</sup>.

Sowing of spring barleys was protracted in the difficult spring. The main varieties were Triumph and Georgie, but some Simon and Wing were grown where mildew resistant and susceptible varieties respectively were required. Some was sown in a dry spell in late February but much could not be sown until April. However, unlike 1980 when there was a severe drought after sowing, there was generally adequate moisture and the later sown spring barleys yielded better than in 1980.

In an experiment where sowing dates were included as a treatment, Triumph yielded 6.5 t ha<sup>-1</sup> when sown on 21 February compared with 5.8 t ha<sup>-1</sup> from a sowing made on 14 April. Insecticides were beneficial on the late sowing but less so on the early sowing. This compared with yields of 6.08 and 4.23 t ha<sup>-1</sup> from early and late sowings in 1980.

In the spring barley variety experiment at Rothamsted the best yield was from Triumph which yielded 6.78 t ha<sup>-1</sup> when treated with fungicide and given 120 kg ha<sup>-1</sup> of nitrogen. Atem gave 6.31 t ha<sup>-1</sup> and Koru 6.15 t ha<sup>-1</sup> when given the same treatment. A blend of Goldmarker, Koru and Triumph gave 6.45 t ha<sup>-1</sup> but all other varieties gave under 6 t ha<sup>-1</sup>.

There was much mildew. Georgie was treated with an ethirimol seed dressing, and nearly all barleys were sprayed with tridemorph, in some cases twice.

Much nitrogen was leached during the wet March. Early-sown crops showed symptoms of nitrogen deficiency and this also occurred where fertiliser had been applied to seedbeds and drilling subsequently delayed by weather. These crops were top dressed with a further 50 kg N ha<sup>-1</sup> in May.

Winter barleys were harvested in late July and early August. The early sown spring barleys were cut in mid-August but the later sowings were not then fit. These were harvested after the winter wheats had been cut. All was cut in good order and little drying was needed.

All the 1982 winter barley crop, principally Igri, was sown in September and early October. As much of it followed another cereal it was sprayed with a pre-emergent herbicide to control grass weeds.



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**Oats.** There were 13.2 ha at Rothamsted and 5.1 ha at Woburn, almost all winter sown. Only stem eelworm resistant varieties were used, Peniarth at Rothamsted and Panema at Woburn. Panema is used as this is resistant to cereal cyst nematode as well as stem nematode. The same varieties were used spring sown and they ripened successfully although late.

The crop remained remarkably disease free without the use of fungicides. Only a small area was sprayed with growth regulator because of difficult spraying conditions and consequently much of the crop lodged.

**Beans.** These were grown mainly at Rothamsted where there were 13.2 ha, nearly half winter sown. As they do not suit the light land only 0.5 ha of spring beans were grown at Woburn to meet experimental needs.

There were many experiments and an increased interest in the winter crop. Unfortunately a combination of severe chocolate spot (*Botrytis fabae*) and frost damage killed some of the winter crop and it was resown to spring beans.

In an experiment investigating pests and diseases, the use of a seed dressing of thiram and benomyl lessened disease and increased yields from 2.89 to 4.48 t ha<sup>-1</sup>. All the 1982 crop was therefore similarly treated but there were problems with drilling as the dressed seed did not flow through the drill well.

The spring crop variety Minden was sown in late February and following benefit in previous years phorate was drilled with the seed to control *Sitona*. This did not give such a big increase in yield as in 1980, and in one experiment the increase was from 3.71 to 4.02 t ha<sup>-1</sup>.

Heavy rain prevented the application of a pre-emergence herbicide and simazine was applied post-emergence. There was some slight scorching of the leaves but the crop grew away successfully and weeds were well controlled. Many aphids were present and a pirimicarb spray was necessary.

In a spring bean experiment on controlling pests and pathogens, phorate drilled with the seed plus a spray of benomyl increased yields of unirrigated crops from 3.93 to 4.5 t ha<sup>-1</sup> and of irrigated crops from 4.66 to 5.0 t ha<sup>-1</sup>.

**Potatoes.** The area was 18.9 ha, about the same as in 1980; of this 10.9 ha were at Rothamsted and 8.0 ha at Woburn. The main varieties at Rothamsted were Pentland Crown and Desiree with a few King Edward, and at Woburn Pentland Crown and Cara were grown.

The eelworm resistant variety Cara, used with a nematicide (aldicarb) when necessary, was very satisfactory. It cropped better than Maris Piper and suffered much less from scab.

Planting at both farms was late and dragged on into May as there were frequent interruptions from rain. On the heavier Rothamsted soil some seedbeds were unsatisfactory but on the lighter Woburn soil they were generally much better. The crop established well however, but was short of water early in the season and where possible it was irrigated. This became unnecessary later as there was more rain, this particularly suiting the crop at Woburn.

The crop was sprayed six times with pirimicarb and mancozeb before pulverising the tops and burning off with sulphuric acid. Lifting was completed by 12 November although at times harvest conditions were poor.

Yields were rather less than in 1980; in a late planted experiment at Rothamsted on the heaviest field an experiment comparing methods of applying fungicides to the seed tubers gave a mean yield of 52.5 t ha<sup>-1</sup>. On a better site another experiment comparing fungicide treatment yielded 56.3 t ha<sup>-1</sup> measured over all treatments.

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**Grass.** All experiments were cut three times and there was ample grass for stock. Silage and hay crops were satisfactory and although haymaking was difficult none was lost. A further 4 ha of grass was sprayed with 'Roundup' and used for cereal crops.

### Cattle

One hundred and twenty-eight were sold fat and 145 yearling steers were bought.

### Staff

A. Joicey joined the staff in January to replace R. N. Bradfer-Lawrence.

P. Laughton resigned from the recorder staff. David Reid left the Woburn Farm staff.

P. Pilgrim was appointed.