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Report for 1976 - Part 1

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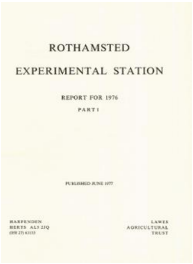

The Farms

R. Moffitt

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THE FARMS

R. MOFFITT

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ROTHAMSTED

The year was again an unusual one. The spring was mild and dry and crops were sown in good time but suffered from the unprecedented summer drought and yields were small. The cereal harvest was the earliest recorded. The autumn, however, was one of the wettest recorded and harvesting of potatoes and sowing of winter cereals was prolonged and difficult.

General

January will be remembered for the gale on the 2nd which blew down about 50 large trees on the estate, and much time was spent clearing these together with an equal number of dead elm.

At the beginning of the year field work was well up to date. The last of the ploughing on the lighter soil was done in January and, as it turned up well, was immediately sown to spring barley. The heavier ground was unfit to drill.

The mild weather continued with less than average rainfall and drilling restarted on 1 March and was completed in good time. Despite the lack of frost good seedbeds were easily obtained.

April was cold with many ground frosts and only 22 mm of rain fell (27 mm less than average). Potato planting was completed by 14 April in contrast to 1975 when it was not even started until the end of April.

May was dry with less than half the normal rainfall and also windy. This hampered spraying of cereals and potatoes with herbicide but all were done and about 16 ha of cereals were sprayed with 'Avenge' (difenzoquat) against wild oats. This was subsequently to be of great benefit as hand pulling in the later hot, dry weather would have been impossible as they ripened and shed quickly.

Growth of grass was slow and irrigation was necessary. Cattle were short of keep and were turned into fields intended for conservation. A light silage cut was taken from grass experiments in mid-May and good quality material was made.

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The summer continued dry and hot, and aphids infested cereals and potatoes. Grain ripened exceptionally quickly and harvesting started on 8 July, almost a month earlier than usual. Yields were poor and grain small.

Grass became non-existent, and it was impossible to water it as the potatoes took priority.

An early finish to harvest on 4 August, followed by an extremely dry month with only 9 mm of rain, enabled much straw to be baled and carted. All barley and oat straw was baled and about half the wheat. The remainder was burnt, without accident, as much wheat straw was unsold after the 1975 harvest.

Total rainfall for the 8 months January–August was less than half normal, 183 mm being recorded, 266 mm less than average. There was then a complete change in the weather, rainfall for September and October being twice normal, and more rain fell in these two months than in the previous eight months. The two months' rain totalled 229 mm. November and December were also wet with above average rainfall.

Harvesting of potatoes was difficult, and 1·5 ha were unlifted at the year's end. Drilling of cereals was extremely difficult and although the lighter land at the western end of the farm was drilled in reasonable order, much of the heavier land was not sown until the end of November and emergence had not taken place at the year's end. A little sowing was possible in December and most of the planned area was sown except where potatoes had yet to be cleared.

Grass grew well in the wet autumn and provided much needed keep for stock. A final cut was taken from the grass experiments and ploughing was almost completed.

Field experiments

There were 3691 large plots managed by the farm and yields were taken from 3244.

Broadbalk was drilled in good time in the favourable autumn of 1975, and a herbicide, terbutryne, was applied to control black-grass (*Alopecurus myosuroides*). This also gave useful control of broad-leaved weeds, and although a hormone weedkiller was applied in the spring, there was some doubt as to whether it was really necessary.

The wheat was badly infested with aphids in late June and was sprayed with 'Aphox' (pirimicarb) for the first time in the history of the experiment.

Because of an attack of a Crambid moth (*Agrophila straminella*) section 9 was sprayed with 'Rogor E' (dimethoate).

Although 'Roundup' (glyphosate) applied in 1975 to the stubbles of section 0, 1 and 9 controlled couch grass (*Agropyron repens*) well, there were still a few patches left and the application was repeated in the autumn of 1976.

The routine chalking continued and sections 1, 2 and 3 were done before ploughing.

Heavy rain made sowing late and soil conditions were very poor. The blackgrass herbicide was omitted because of the risk of transferring soil across plots.

The potato variety was changed to Pentland Crown. King Edward, used previously, gave many small tubers on plots where small amounts of nitrogen are applied or some minerals omitted. On the best plot, surprisingly good yields were obtained despite the drought.

On Barnfield, beans sown on sections 1 and 2 to test simazine residues gave poor yields.

The S22 ryegrass on the rest of the field gave a useful early cut of grass despite a thin plant. Pending a decision on the future of the experiment a further year at least in grass was required, and the ryegrass was broken up with tined implements in late summer and perennial ryegrass was resown. A good take was achieved.

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Crops

There were 264 ha farmed. Cereal crops occupied 142 ha, and the other main crops were potatoes (11 ha) and beans (12 ha). There were 77 ha of grass and the remaining area was occupied by maize, sugar beet, oilseed rape and fallow.

Wheat. There were 53 ha mostly winter sown. The main varieties were Cappelle and Atou, with a little Maris Huntsman.

A little Sappo spring wheat was grown including some for seed production but yields were poor because of drought.

Winter wheat was sown in good time and grew well during the mild winter. Top dressing was done rather earlier than usual and was finished by 9 April. It withstood the dry season well until June when it was badly infested with aphids and growth checked severely by drought.

Some fields were sprayed with 'Aphox' (pirimicarb) using ground tackle as aerial application can involve hazards to experiments on other crops. An effective kill was achieved but much of the potential benefit was lost as in early July a period of intense heat with desiccating winds caused the crop to die off prematurely.

Where an aphicide test was included in the variety experiment the yield was increased by only 0·16 t ha^{-1}. In the same experiment, on a site free from soil-borne diseases, the semi-dwarf varieties Maris Fundin and Hobbit gave the biggest yields, 6·45 t ha^{-1} and 6·42 t ha^{-1} respectively. Maris Huntsman yielded 6·08 t ha^{-1} and Atou 5·85 t ha^{-1}. Cappelle yielded 5·11 t ha^{-1}.

Barley. There were 72 ha of barley, nearly all spring sown, except for 8 ha of winter barley. The standard variety was Julia; home-grown seed treated with an ethirimol seed dressing to control mildew (*Erysiphe graminis*) was used.

A small area of Astrix winter barley, sown early and sprayed against mildew, yielded 5·0 t ha^{-1}, probably because it matured before the very hot weather in July. Maris Otter grown on a lighter soil did less well.

Harvesting of spring barleys was finished on 28 July. Most fields averaged 3·25 t ha^{-1} and the best field yielded 4·12 t ha^{-1}. Yields were about the same as in 1975; the advantage of more timely sowing was nullified by the drought. Best results from field experiments were 5·0 t ha^{-1}.

Oats. There were 17 ha of winter oats. The eelworm resistant variety Peniarth was grown and averaged 5·25 t ha^{-1}, although the grain was thin. Consequently, some light but viable grains were lost over the combine straw walkers, and volunteers were numerous. No spring oats were grown.

Potatoes. There were 11 ha of potatoes. The varieties were again Pentland Crown and King Edward. The King Edward was grown from bought-in seed as the 1975 crop was unsuitable for seed because of virus spread.

The policy of growing a proportion of FS stock in isolation for seed for the ware crop and field experiments was continued but for the second year running virus Y spread in King Edward rendered it unsuitable for seed, although the Pentland Crown which is resistant was satisfactory.

Despite the use of phorate granules at planting and several insecticide sprays, it was impossible to control the large numbers of aphids. There was evidence of aphids becoming resistant to 'Metasystox' (demeton-S-methyl), and 'Aphox' (pirimicarb) was used after the first spray. Two precautionary blight sprays were given and an aphicide was included.

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During the hot, dry weather irrigation was necessary at an early date, and it was continued throughout the summer. During the hottest of the weather, water was applied at night only as evaporation was rapid during the day.

Second growth, particularly in King Edward, was serious; the first-formed tubers broke dormancy and sent out stolons with later formed tubers attached. This subsequently caused storage problems.

Lifting was difficult in the wet autumn, and at times water stood in the rows. Although all experiments were eventually lifted, about 1·5 ha of potatoes remained in the ground at the year's end. The frosts in December caused much damage and hand sampling showed over 50% loss. Yields were surprisingly good. Unirrigated Pentland Crown on the best plot on Broadbalk yielded 37·5 t ha^{-1}, and in an experiment comparing irrigation, plots with full watering averaged 38·6 t ha^{-1} compared with unirrigated plots which yielded 23·7 t ha^{-1}.

Beans. There were 12 ha mostly spring sown. There were 2 ha of winter beans grown for an experiment on chocolate spot (*Botrytis fabae*) but none appeared in the dry summer. These averaged 2·5 t ha^{-1}.

Spring beans suffered severely from drought. In an experiment testing many factors, irrigation increased the mean yield from 1·65 t ha^{-1} to 3·05 t ha^{-1}, but 250 mm of irrigation water were required.

Some crops yielded less than 0·5 t ha^{-1} and they came to harvest very early. To avoid shedding they were combined in July before harvesting spring barley, an unprecedented event.

Simazine was ineffective in controlling weeds and tractor hoeing was necessary. There was little aphid (*Aphis fabae*) and no spraying was done.

Grass. Growth was slow in the dry spring. A light silage cut was taken in mid-May and some fields intended for hay were cut instead for silage to free aftermath grazing for stock.

In the event there was little recovery in the extremely dry, hot weather; keep for stock became non-existent and supplementary feeding was necessary until grass recovered in the wet autumn.

Newly sown leys suffered and most were resown in the autumn. Some grass on land which is purposely kept poorly supplied with minerals has become infested with couch grass (*Agropyron repens*) and 8 ha were broken up after the first cutting or grazing and fallowed. Because the ground was so hard a contractor with a crawler was employed.

Maize. A small area was grown for experimental purposes. The soil was dry when sown so it was irrigated once shortly afterwards to encourage germination and although no further water was given a good plant stand and a useful yield was obtained.

Sugar beet. Very little was grown and, as with the maize, irrigation after sowing was necessary to establish the crop.

Cattle

Keep was short and despite some supplementary feeding, stock were slow to fatten. Seventy eight cattle were sold fat and 109 stores were bought.

Equipment

The irrigation reservoir which had been leaking for some time was lined with a butyl liner

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after cleaning out and regrading the sides. This was of immense benefit in the dry summer and saved much water loss.

For the first time ever, the limit of the licence for water extraction was reached at the end of August, despite restricting watering to those experiments testing irrigation and the potatoes.

Staff

P. L. Dixon was appointed to the recorder staff. W. A. H. Burton, who gave 28 years' service, 21 years as farm foreman, retired at the end of October.

WOBURN

General

The weather was generally similar to that at Rothamsted and consequently all crops, particularly grass and potatoes on the light land, suffered severely from drought.

All crops were sown in good time but grew slowly in the dry spring and summer, and the harvesting of cereals was about one month earlier than usual. All straw was baled and carted but straw yields were light. All stubbles were then cultivated.

Potatoes, particularly Maris Piper, died off early, and an early start to lifting was made. Good progress was made before the wettest of the autumn weather made lifting difficult and all potatoes were lifted by 23 November.

The planned area of winter cereals was sown and all had emerged by December.

Total rainfall for the year was 498 mm, of which 349 mm fell in September/December. The average annual rainfall is 624 mm.

There were 1719 experimental plots managed by the farm and yields were taken from 1576. In addition there were 972 microplots and other plots largely managed by departments.

Crops

Wheat. There were 7·5 ha, the main varieties being Cappelle (0·6 ha) and Bouquet (5·7 ha). Although sown in good time, some crops suffered from rabbit grazing in the winter and only recovered in the spring after an earlier than usual top dressing with 'Nitro-Chalk'. One small, late-sown area was so badly damaged that it was resown to spring barley.

Wheat continued to look well until May but started to die out in June. As at Rothamsted it was badly infested with aphid and was sprayed in late June.

Barley. There were 18·5 ha, all Julia, grown from seed produced at Rothamsted and dressed with ethirimol.

Sowing started in good conditions on 1 March and most was done by 15 March. A wet week then prevented further work but all barley was sown by 24 March.

Harvest was early and yields below average. In an experiment comparing varieties the best yield was 4·04 t ha^{-1} obtained from the Rothamsted grown Julia. This out-yielded a multiplication stock of the same variety by 0·36 t ha^{-1}, and slightly out-yielded Ark Royal, Georgie, Sundance and Porthos.

In the dry season a spray of tridemorph was more effective in controlling mildew (*Erysiphe graminis*) than an ethirimol seed dressing. Ethirimol treated seed gave a lesser yield than untreated seed.

Because of the drought the grain sample was thin. Field yields on the light land were about 2·5 t ha^{-1} but on one better field 4·25 t ha^{-1} was recorded.

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Oats. There were 3·7 ha of winter oats grown for the first time at Woburn. Unfortunately they suffered from manganese deficiency and were very patchy, yielding 2·75 t ha^{-1}. Following harvest, FYM was spread for potatoes and ploughed in.

Beans. Very few were grown following the disastrous crop of 1975. They do not suit the light soils at Woburn and results this year were equally bad.

Potatoes. There were 8 ha equally divided between Maris Piper and Pentland Crown. Most were planted by mid-April but some experiments required treatment with nematicide and these were delayed until later in the month. Two precautionary blight sprays and two sprays against aphid were given.

Maris Piper died off prematurely and, as the weather was dry, no desiccant was necessary on the haulm; mechanical pulverisation only was used.

Lifting started in September but yields were poor with a large proportion of small tubers.

Pentland Crown stayed green until the autumn rains which benefitted the crop, and yields were better. Partly due to the large amount of soil brought in at lifting, soft rots caused trouble in store.

Yields varied from 7·8 t ha^{-1} of Maris Piper grown without irrigation to a best yield of 80·3 t ha^{-1} of Pentland Crown on one experiment involving close planting of large seed and irrigation and nematicide.

Sugar beet. Little was grown. Except on one experiment on fluid drilling which was sown early and failed, a good plant was obtained but yields were poor and root size very small. One experiment on Great Hill was ploughed in.

Grass. Grassland suffered particularly and keep for stock was non-existent for much of the summer.

The first year of a two-year ley sown on the sandy soil of Great Hill in the autumn of 1975 gave little production and became weedy. It was cut for hay in May but then dried out so it was broken up and sown to winter oats to preserve the rotation. So hard was the ground that a single-tine subsoiler had to be used as a first operation.

Another 3 ha of older grassland which was weedy was broken up and fallowed before sowing to winter wheat. Newly sown leys on the revised ley arable experiment on Stackyard failed and were resown in the autumn.

Cattle

Thirty six young cattle were bought for grazing but because of the shortage of keep they did not fatten off the grass and were yarded.

Buildings and equipment

The gales in January caused extensive damage to the cattle yard roof but this has been repaired.

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