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Report for 1980 - Part 1

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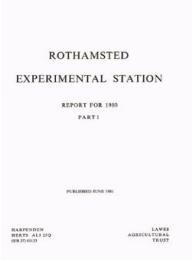
ROTHAMSTED
EXPERIMENTAL STATION

REPORT FOR 1980
PART 1

The Farms

R. Moffitt

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THE FARMS

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Rothamsted and Woburn

The season was an unusual one. A spring which promised well turned wet and difficult and was then followed by a 5-week drought and crops suffered. The early summer was one of the wettest and coldest for many years but the later summer and autumn were favourable and most crops eventually turned out well.

Cereal harvest was done in good conditions and the autumn was favourable for potato lifting and sowing. Only some ploughing remained to be done at the year's end.

General

January was cold but dry. There were 28 ground frosts and rainfall was 37 mm, 28 mm less than average.

February however was mild and although rainfall was average (49 mm at Rothamsted and similar at Woburn) most fell in the early part of the month and at the end of the month it was possible to start field work on the lighter soils. The dry spell was short and in early March the weather broke and the remainder of the month was very wet. Twenty rainy days were recorded and rainfall was well above the average, 85 mm being recorded.

Field work was not commenced until 5 April when a prolonged dry spell began and continued throughout April and May.

During these 2 months only 53 mm of rain were recorded at both farms, about half the average. The weather was also windy and the topsoil dried out affecting the growth of later sown crops and crop spraying was difficult.

Late June and July were wet, Woburn having more rain than Rothamsted. June rainfall at Rothamsted was 74 mm and at Woburn 92 mm fell. In July there were 84 mm at Rothamsted and 113 mm at Woburn. Early August was changeable with violent rain at times particularly at Woburn (monthly total 124 mm, 62 mm above average). This caused flooding in places. Rainfall at Woburn for the 3 month period was 329 mm,

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double the average of 164 mm. Rothamsted was drier; August rainfall (52 mm) was less than average and the total for the June/August period was 220 mm. Harvest work resumed in the latter part of the month and was speedily completed as September was drier and warmer than average.

September was favourable for field work with less than half the average rainfall, 26 mm being recorded at Rothamsted, 35 mm less than average. Seed potatoes were lifted and winter barleys were sown as were early drillings of wheat.

The fine weather continued until mid-October and potato lifting and drilling progressed well. However there was then much rain and the monthly total was 101 mm, 27 mm above average. Towards the end of the month there was a drier spell which continued into early November and this enabled the last of the planned autumn sowings to be done.

Both November and December were drier than average but with numerous ground frosts. Rainfall at Rothamsted in November was 47 mm, 24 mm less than average and in December was 45 mm, 22 mm less than average.

Field experiments

There were 5460 plots managed by the farm and yields were taken from 4875. In addition there were 1266 large plots and 2429 microplots managed by departments on which some operations were done by the farm.

The trend to autumn sowing was maintained and fortunately a favourable 1979 autumn allowed the programme to be completed. The 1980 autumn programme was also large, with a growing interest in winter barleys and beans.

Broadbalk was sown in good time and grew much better than in 1979. Weeds were controlled with 'Dicurane' (chlortoluron) in autumn and 'Banlene Plus' (dicamba/mecoprop/MCPA) in spring.

Section 3, the first wheat after fallow, was sprayed with 'Folimat' (omethoate) to control wheat bulb fly. All wheat was sprayed with 'Bayleton' (triadimefon) to control disease and 'Aphox' (pirimicarb) to control aphid.

The best plot on Section 4 (first wheat after potatoes) yielded 8·8 t ha^{-1} and the best plot on Section 0, the 29th consecutive wheat crop, yielded 8·35 t ha^{-1}.

The 1981 crop was sown on 1 October.

On Hoosfield the variety was changed to Georgie and it was sown on 21 February. The best plot yielded 7·3 t ha^{-1}.

At Rothamsted another experiment investigating the effect of different rates and combinations of P and K applied to the subsoil was started and the long-term experiment at Woburn on direct drilling and deep PK entered its first cropping year.

Cultivations on the latter experiment were done too late in 1979 to permit autumn sowing but the experiment was successfully sown to autumn crops in 1980.

Pressure on land continues, a grass field recently broken up is being used in part for cereal experimentation and laboratory glasshouse needs have taken another 1 ha.

Crops

There were 338 ha farmed (262 at Rothamsted and 76 at Woburn). Cereal crops occupied 197·0 ha, potatoes 18·5 ha and beans 18·0 ha. There were 84·0 ha of grass and small areas of oilseed rape, maize, sugar beet and peas. The remainder was fallow.

Wheat. There were 50 ha at Rothamsted and 23·5 ha at Woburn, mostly winter sown. The main variety of winter wheat was Flanders, but some Hustler, Bounty and Huntsman were also grown.

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Benefiting from more timely sowing and more autumn rainfall than in 1978–79 the crop survived the winter well. Only one or two late sown crops looked thin and these were given an initial top dressing of 'Nitro-Chalk' in February to help recovery, followed by a further dressing in April. All other winter wheat, except for experiments where times of applying nitrogen were being tested, received nitrogen in one application in April.

Crops which had not received an autumn herbicide were sprayed in spring with a hormone weedkiller. There were fewer wild oats than usual and spraying was unnecessary.

Generally disease incidence was low and only a few crops were sprayed with fungicide against leaf diseases. Aphids started to multiply rapidly in late June and some spraying was done but numbers then rapidly declined through natural causes and spraying was halted. In an experiment where aphicide was tested there was little effect on yield.

In general except for a thin crop on very light soil at Woburn yields were better than in 1979. The better crops gave field yields of about 7·5 t ha^{-1}, several experiments exceeded 8 t ha^{-1} and occasionally 9 t ha^{-1}.

In a repeat of the 1979 experiment testing factors affecting yield at Rothamsted, Hustler gave a mean yield of 9·61 t ha^{-1}. Sowing on 20 September gave a mean yield of 10·12 t ha^{-1} compared with 9·10 t ha^{-1} from sowing on 19 October. Fungicides increased yield from 9·22 to 10·01 t ha^{-1}. A similar experiment on the heavy land at Woburn gave a mean yield of 8·52 t ha^{-1}.

In the variety experiment on a site following oats the best yield of 10·45 t ha^{-1} was from Brigand with 189 kg N ha^{-1} and growth regulator. Armada when similarly treated gave 10·38 t ha^{-1} but Flanders and Hunstman gave about 1 t ha^{-1} less. In a similar experiment at Woburn, Brigand yielded best with a yield of 9·05 t ha^{-1} from the largest rate of nitrogen.

Most spring wheat was grown at Woburn on the heavy land cultivation experiment. Because of late cultivations in 1979 there was little weathering of the soil and it was difficult to get a satisfactory tilth. It was sown late, germination was very patchy and it yielded poorly.

Barley. There were 88·0 ha at Rothamsted of which 22·5 ha were winter sown. At Woburn there were 17·0 ha, of which 3·5 were winter sown.

The winter barley showed an increase on 1979 and the main variety grown was Igri. 'Milstem' (ethirimol) dressed seed was used to control mildew and a single spray of 'Bayleton' (triadimefon) spray was applied in spring. Field yields were 7·0 t ha^{-1} with a best yield from experiments of 7·9 t ha^{-1}. Some Athene was grown and where disease susceptible varieties were required for experiments Hoppel and Maris Otter were grown.

Most winter barley was sprayed with 'Tribunil' (methabenzthiazuron) in the autumn to control weeds and where necessary a hormone was used in spring.

Sowing of much of the spring barley was delayed. Some was drilled in the fine spell in February/March but as priority was given to sowing beans it was not possible to finish before the weather broke. The remainder was not sown until late April and then suffered a prolonged drought, and some crops emerged irregularly. As with the winter wheat, herbicide spraying was difficult because of wind. At Woburn there was less spring barley than in 1979 as more land had been sown to winter wheat, and generally more timely sowing was achieved.

Early sown spring barleys were harvested in mid-August but the later sown crops were not then fit and winter wheats were cut before resuming work on remaining barleys.

The main variety was Georgie which has been consistently reliable. At Rothamsted some Triumph was grown, which did well, and where a mildew susceptible variety was required Wing was grown.

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Early sown barleys yielded satisfactorily but the later sown ones were not so good. In one experiment which included sowing date as a treatment, barley sown on 24 March yielded 6·08 t ha^{-1} compared with a sowing on 28 April which yielded only 4·23 t ha^{-1}.

In the variety experiment Triumph yielded best at both farms and at Rothamsted despite sowing on 5 April yielded 7·3 t ha^{-1} where 113 kg N ha^{-1} was applied. Georgie was the next best yielding 6·85 t ha^{-1} at the same nitrogen rate, although with all varieties there was little response above 75 kg ha^{-1}. The Woburn experiment which was sited on a light land site suffered from heavy rain which caused the soil to cap after sowing on 26 March. There was a worthwhile response to 113 kg N ha^{-1} and at this rate Triumph gave 6·22 t ha^{-1}. Georgie did less well, yielding 5·41 t ha^{-1} at the same rate and was outyielded by all other varieties except Athos and Porthos.

Oats. There were 14 ha at Rothamsted and 4·5 ha at Woburn, almost all winter sown. Because Pennal survived the 1978–79 winter poorly the variety was changed back to Peniarth which is more winter hardy. Most crops were sprayed with chlormequat but despite this there was some lodging.

Very few spring oats were grown. In the past the old variety Manod has been grown but there is fresh evidence that it is not resistant to stem eelworm as previously thought and will no longer be grown.

Beans were grown on 18·0 ha of which 7·5 ha were winter sown.

There was an increased demand for experimental crops, particularly winter beans. All experiments were at Rothamsted and only 2·0 ha of winter beans were sown at Woburn. These were grown on a light hilly field and were not a success as there was severe erosion in the winter. They were resown to spring beans and again in the wet April erosion was severe.

The crop at Rothamsted was more successful. Winter beans, var. Throws MS, gave an overall yield of 4·5 t ha^{-1}. Weeds were controlled with an autumn application of 'Remtal' (trietazine/simazine) or 'Kerb' (propyzamide) and although there was some chocolate spot (*Botrytis fabae*) this was kept in check with two sprays of 'Benlate' (benomyl).

Spring beans, var. Minden, were sown in good time and yielded well. In an experiment where *Sitona* was controlled with combine drilled 'Yaltox' (carbofuron) yields were increased from 4·02 to 5·49 t ha^{-1} but ripening was delayed.

Weeds were controlled with 'Remtal' and there were many aphids, but a single spray of 'Aphox' followed by a barrier spray round the headlands controlled these.

Despite careful selection of seed from a stem eelworm-free stock most crops were found to contain some infection, probably from the soil. Fortunately those grown at Woburn proved to be free from infection and should provide satisfactory seed for 1981.

Potatoes. The area planted with potatoes (18·5 ha) was slightly less than in 1979; 12·0 ha were at Rothamsted and 6·5 at Woburn.

The seed crop at Rothamsted occupied 4·5 ha and was lifted in early September to provide suitable sites for early sown wheat and barley experiments.

The varieties grown were Pentland Crown, King Edward and Desiree and these varieties were also grown for ware.

At Woburn Pentland Crown was the main variety but the early variety Pentland Javelin was grown to provide a suitable site for early sown wheat. Very little Maris Piper was grown as it has often suffered from scab, so a small area of the recently introduced eelworm-resistant variety Cara was grown instead.

Planting at both farms began in mid-April and there was little interruption from

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weather. Satisfactory seedbeds on the heavier soils at Rothamsted were difficult to obtain and were somewhat cloddy. These dried out rapidly after planting and some crops emerged unevenly. These were irrigated early in the season but this was not necessary during the subsequent wet summer.

Fortunately experiments were sited to avoid the difficult soils and where satisfactory tilths were obtained initial establishment and yields obtained were good. In one experiment comparing varieties and methods of seed treatment Pentland Crown gave a mean yield of 68·3 t ha^{-1}, Desiree 61·3 t ha^{-1} and King Edward 58·4 t ha^{-1}.

At Woburn on the light land it was easier to obtain a suitable tilth and the crop established and grew well, and an experiment comparing different forms of nitrogen yielded 69·4 t ha^{-1} of Pentland Crown.

Generally there was little blight and few aphids. The crop was sprayed routinely before pulverising the tops and burning off with sulphuric acid.

Grass. Initial growth was slow in the dry spring and first cuts of silage and hay were light. Haymaking was difficult, but all was got in fair order although much was cut that was rather mature. Hay from one field required ventilation in the stack to avoid heating.

Later growth was much better particularly on the light land at Woburn which often produces little mid-season grazing.

At Woburn one field of 3 ha was resown to grass, after a fallow to control perennial grassy weeds. At Rothamsted a further 6 ha were broken up and fallowed before sowing to arable crops, and 5·5 ha were sprayed with glyphosate and direct drilled to winter wheat.

Cattle

One hundred and forty-seven were sold fat from the two farms and 87 yearling steers were bought.

Buildings and equipment

Refrigeration was installed in the Woburn chitting store to permit seed to be stored under similar conditions to Rothamsted. The 14-year-old combine harvester was replaced with a more up-to-date machine.

Staff

Roderick N. Bradfer-Lawrence resigned. Of the recorder staff N. D. Cowlishaw left and P. Laughton and T. Hall were appointed.

T. Ablewhite retired after 38 years' service and M. Herring and G. Catherall joined.

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