ROTHAMSTED RESEARCH

Report for 1979 - Part 1

Full Table of Content

The Farms

R. Moffitt

R. Moffitt (1980) *The Farms ;* Report For 1979 - Part 1, pp 95 - 99 **- DOI: https://doi.org/10.23637/ERADOC-1-136**

THE FARMS

R. MOFFITT

Staff

Head of Farms R. Moffitt, B.Sc.

Assistant Managers
R. N. Bradfer-Lawrence, B.Sc.
J. M. Smith

Bailiff (*Woburn*)
A. W. Neill

Personal Secretary
Brenda M. Simpson

Shorthand Typist
Mrs. Janet Hurst

Recorders (*Rothamsted*)
M. N. Rogers
K. L. Sykes, B.Sc.
N. D. Cowlishaw
P. J. Tuck

Recorders (*Woburn*)
G. T. Pearce
Q. D. Pope

Farm Workers
T. E. Ablewhite
T. H. Battams
V. Bowes
T. R. Chalkley
R. Fearn
R. W. Gibson
V. E. Goldring
F. D. Ledbury
A. V. Pawson
D. Reid
G. N. Talbot

ROTHAMSTED AND WOBURN

The season was varied. The winter was cold and a wet spring followed. Spring plantings were late and protracted. Crops suffered from lack of rain in July particularly on the light land at Woburn. Cereal harvest was late but lost time was made up in a favourable autumn. Potato harvest and sowing of winter cereals were done in good conditions.

Field work was well up to date at the year's end.

General

January was extremely cold with snow and slightly more than average rainfall. Twenty-nine ground frosts were recorded. The wintry weather continued into February which then became wet, and rainfall at 71 mm was 22 mm above average.

March was very wet; rain was recorded on 26 days and at Rothamsted 133 mm of rain fell compared with the monthly average of 46 mm. Woburn fared nearly as badly and field work at both farms was impossible.

April started with much rain and it was the middle of the month before arable work started. Late in the month top dressing of winter cereals with 'Nitro-Chalk' was completed. Rainfall was twice the average, 95 mm falling at Rothamsted and 87 mm at Woburn. May again had twice the average rainfall. Sowings of beans and cereals were finished on 3 May and potato planting, although frequently interrupted by rain, was completed on 18 May. Crop spraying was difficult because of rain and wind.

June was a more favourable month with less rain and grass was conserved as either silage or hay. There were 32 mm of rain, 25 mm less than average at Rothamsted, but at Woburn 43 mm fell, 17 mm less than average.

July was a much drier month, 24 mm of rain falling at Rothamsted compared with the average of 53 mm and at Woburn only 14 mm fell. Cereals and potatoes suffered especially on the light land at Woburn. At Rothamsted, where water is available, irrigation of potatoes began.

August started with a favourable spell of weather and winter barleys were harvested,

https://doi.org/10.23637/ERADOC-1-136

but the weather then turned wet with very strong winds. However, at the end of the month the weather improved and cereal harvest resumed. Rainfall for the month was about average, mostly falling in mid-month.

September was very dry with only 19 mm of rainfall at Rothamsted compared with the average of 61 mm, and at Woburn there were 14 mm. Cereal harvest at both farms finished on 7 September.

The fine weather continued in October and autumn work progressed well. There was a very wet spell about mid-month and rainfall was slightly above average, 86 mm falling at Rothamsted and 81 mm at Woburn, compared with the average of 73 mm and 63 mm respectively. Generally it was a favourable month for field work. Harvesting of beans was completed and potato lifting finished. Apart from a few late sowings all winter cereals were sown.

November was generally mild at first but cold later in the month. Ploughing of land required for spring cropping continued. December was also mild at first but there was a little snow towards the end of the month and it turned very cold at the month's end. Autumn cultivations and ploughing were well up to date at the end of the year.

Field experiments

There were 6430 plots managed by the farm and yields were taken from 5611. In addition there were 856 plots managed by departments and 2699 microplots on some of which operations were done by the farm.

Numbers increased slightly at Woburn from the 1978 figure of 1577 to 1695 and at Rothamsted there was an increase from 4159 to 4735. There was a large programme of autumn-sown crops and this trend was maintained in the autumn of 1979. A favourable season fortunately allowed the work to be done. Germination of crops was much better than in the dry 1978 autumn.

The variety on Broadbalk was changed to Flanders. Germination in the dry 1978 autumn was poor but the crop eventually recovered. The autumn herbicide 'Dicurane' (chlortoluron) was effective despite the dry conditions but another herbicide spray of 'Banlene Plus' (dicamba/mecoprop/MCPA) was used in spring. There was some mildew and 'Bayleton' (triadimefon) was applied on 27 June.

The first wheat after fallow was disappointing and the best plot of Flanders was the first wheat after beans which yielded 8·70 t ha^{-1}. This compared with a similar plot of Cappelle in 1978 which yielded 7·84 t ha^{-1}. The best yield on Section 0, the 28th successive wheat, was 6·64 t ha^{-1}.

Germination of the crop sown in October 1979 was better as there was more soil moisture.

On Hoosfield Julia was grown for the last time. Although sown earlier, 6 April, than most crops, it was not possible to apply test nitrogen until 18 May because of pressure of other work and consequently the crop suffered.

The stubble was sprayed with 'Roundup' (glyphosate) as there were some rhizomatous grass weeds.

Experiments at Rothamsted and Woburn, designed to investigate factors affecting the yield of the wheat, produced the best yields ever grown. At Rothamsted a mean yield of 9·68 t ha^{-1} was obtained with the best plots yielding well over 11 t ha^{-1}, and on light land at Woburn a similar experiment gave a mean yield of 7·77 t ha^{-1}.

At Rothamsted a further programme of work investigating the effect of deep loosening of soils and the incorportation of P and K into the subsoil was initiated.

At Woburn an experiment was started to investigate the effects of interrupting sequences of direct-drilled crops with conventional cultivation and deep PK incorporation.

https://doi.org/10.23637/ERADOC-1-136

Because of increasing pressure on land, 6·5 ha of arable and 11·6 ha of grass on which manuring was restricted to nitrogen only, will now receive normal manuring after a large initial application of P, K and chalk. Another 2 ha have been allocated to small plot experiments, and 1 ha was used to provide a new car park.

Crops

There were 339 ha farmed (263 at Rothamsted and 76 at Woburn). Cereal crops occupied 180 ha, potatoes 20·1 ha and beans 17 ha. There were 96·8 ha of grass and small areas of oilseed rape, maize, sugar beet, peas and fallow.

Wheat. There were 57·9 ha at Rothamsted and 11·9 ha at Woburn, almost all winter sown.

The main varieties were Flanders and Maris Huntsman with some Hustler. A little Cappelle was grown where a variety change was undesirable in the last year of some long-term experiments.

Germination was slow and the crop also suffered during the cold winter and wet spring and one small field at Rothamsted was redrilled, as was one at Woburn. Top dressing with 'Nitro-chalk' was completed in late April. Most winter wheat was sprayed with a hormone weedkiller except where an autumn herbicide had been used. Some fields were sprayed against wild oats with 'Avenge' (difenzoquat) and the remainder were hand-rogued where necessary. There were fewer than in previous years.

There were few leaf diseases except for some mildew (*Erysiphe graminis*) in Flanders. However there was much take-all (*Gaeumannomyces graminis*) where wheat followed another cereal.

Aphids (*Metopolophium dirhodium*) were numerous on the leaves and evidence from the experiment investigating factors affecting yield (see above) indicated that aphid control produced a yield benefit of 1·3 t ha^{-1}.

Fungicides were also shown to be beneficial in this experiment increasing yield by 0·97 t ha^{-1}, but sowing in September compared with October sowing only increased yield by 0·15 t ha^{-1}.

In the variety experiment Flanders and Maris Huntsman were most consistent but the newer varieties Hustler and Mardler were disappointing. On a site following potatoes a best yield of 7·09 t ha^{-1} was obtained from Maris Huntsman with 126 kg N ha^{-1}. Flanders gave 6·84 t ha^{-1} and Mardler 6·05 t ha^{-1}. No fungicides were used. The yield pattern was similar on another site following wheat but there was much take-all and results are difficult to interpret. There was, however, little benefit from applying more than 126 kg N ha^{-1} despite there being little nitrogen in the soil after the wet winter.

Again, as in 1978, late nitrogen did not improve yield and this treatment is discontinued for the 1980 crop.

In an experiment comparing rates and times of nitrogen application a best yield of 7·79 t ha^{-1} was obtained from 150 kg ha^{-1} applied all in April, the normal practice on the farms.

Barley. There were 85·7 ha at Rothamsted of which 24.7 ha were sown in autumn and 61·0 in spring. At Woburn 15·1 ha were grown.

The winter barley was nearly all Sonja with some Igri, Athene and Hoppel.

Germination on some fields was patchy and one experiment following beans was irrigated in November 1978. This gave a mean yield of Athene of 8·60 t ha^{-1} and, where diseases were controlled, yielded 10·21 t ha^{-1} on the best plot. Sonja yielded less well.

Spring barleys were sown late and seedbeds were difficult to obtain as the frost tilth was lost during the wet spring. Most barley was sown in late April and early May.

https://doi.org/10.23637/ERADOC-1-136 *pp 4*

The main varieties were Athos and Porthos. Some Wing was grown where a variety susceptible to mildew was needed for certain field experiments. Julia was grown for the last time on Hoosfield.

Seed was dressed with 'Milstem' (ethirimol) against mildew and on experiments 'Calixin' (tridemorph) was included in the herbicide spray as well.

Spraying with herbicides was difficult as the season was wet and windy, and many crops were sprayed late. As with the wheat there was much aphid particularly on the later-sown crops, but there was little evidence that they were harmful.

Mildew was not serious and in an experiment on mildew control sprays of 'Calixin' increased yield of Wing by only 0·37 t ha^{-1}. Sowing on 8 May lessend yield by 0·96 t ha^{-1} compared with sowing on 17 April.

The variety experiment at Rothamsted was the last experiment to be sown, it yielded poorly, and the short-strawed varieties Magnum and Minak were particularly disappointing. More timely sowing was achieved at Woburn, where the best mean yield was 5·74 t ha^{-1} from 113 kg N ha^{-1}. Goldmarker gave the best yield of 6·53 t ha^{-1} followed by Georgie which gave 6·26 t ha^{-1}. Athos and Porthos gave similar yields of 5·95 t ha^{-1} and 5·93 t ha^{-1} respectively.

Most barley yields at Rothamsted were slightly less than in 1978. Where they were late sown, yields were considerably less. Barley yields on the light land at Woburn also suffered greatly.

Oats. There were 5·3 ha of winter oats at Rothamsted and 4·2 ha at Woburn. The variety was changed to Pennal instead of Peniarth and a little Panema was also grown. Unfortunately, the harsh winter did not suit Pennal which appears to be less hardy than Peniarth and all was resown in the spring, some to Manod and some Peniarth. All came to harvest but yield was depressed.

Beans. There were 3·4 ha of Throws MS winter beans and 13·6 ha of Minden spring beans.

Winter beans suffered in the winter. Those at Rothamsted recovered and eventually gave a useful crop but at Woburn there were insufficient plants left and they were ploughed in. Potatoes were planted instead to preserve a break from cereals in the rotation and turned out well. There was little chocolate spot (*Botrytis fabae*).

The sowing of spring beans was protracted due to inclement weather. Some were sown in reasonable time and yielded up to 4·9 t ha^{-1}, but one experiment, where soil incorporated nematicides were required before planting, suffered from rain which spoilt the seedbed before it was sown.

As it was difficult to sow beans sufficiently deeply to protect them from simazine damage the herbicide used was changed to 'Remtal' (trietazine/simazine).

There was much aphid (*Aphis fabae*) and all spring beans were sprayed with 'Aphox' (pirimicarb) in late June and a second barrier spray around the outsides of fields was applied later.

Winter beans also received a barrier spray.

All beans were harvested in good conditions although the later-sown crops did not ripen until October and required much drying.

Potatoes. There were 20·1 ha grown, 12·4 ha at Rothamsted and 7·7 ha at Woburn.

The area of seed grown at Rothamsted was increased to 4 ha to provide a greater bulk and to allow closer grading of seed for both experiments and the ware crop in 1980. They were irrigated and lifted early in order to provide sites for early-sown wheat and barley experiments. Sample digging indicated a yield of about 50 t ha^{-1}.

https://doi.org/10.23637/ERADOC-1-136

At Rothamsted the main varieties were Pentland Crown, King Edward and a few Desiree.

At Woburn, Pentland Crown and Maris Piper were grown. Despite a wide rotation and the use of the eelworm resistant variety Maris Piper, potato cyst eelworm (*Globodera rostochiensis*) is becoming an increasing problem and nematicides may have to be used as a routine in future.

Planting was difficult and late. Satisfactory tilths were difficult to obtain because of wet weather and suitable working days were few.

Experiments were planted either by hand or by hand-fed planters but seed and ware crops were planted by an automatic planter shared between Rothamsted and Woburn farms. This was invaluable in speeding work rate in the difficult spring.

Weeds were controlled by a mixture of linuron and paraquat. There was little blight (*Phytophthora infestans*) but routine sprays of 'Dithane' (mancozeb) were used as a precaution.

The haulm was burnt off with BOV (70% sulphuric acid) and then pulverised.

Lifting conditions were excellent and there were few interruptions from weather. Lifting at Rothamsted was completed by 23 October and at Woburn by 29 October.

Where possible at Rothamsted the crop was irrigated and this benefited the crop, particularly King Edward. Unirrigated King Edward were less satisfactory but Pentland Crown produced a satisfactory sample at both farms despite a dry June and July.

One experiment at Rothamsted, although planted late in less than ideal conditions, yielded 46·6 t ha^{-1} of total tubers. In an experiment comparing seed stocks, unirrigated King Edward gave a mean yield of 32·9 t ha^{-1} and Pentland Crown 31·6 t ha^{-1}.

A similar experiment at Woburn on light land gave a mean yield of 37·4 t ha^{-1} and the best treatment yielded 41·1 t ha^{-1}.

Grass. The wet, cold spring lessened grass growth. At Rothamsted, three cuts were taken from grass experiments and the produce was made into silage. Grass surplus to grazing needs was ensiled or made into hay, all of good quality.

The light land at Woburn suffered in mid-season and cattle were therefore transferred to Rothamsted.

In established swards couch (*Agropyron repens*) is becoming a problem at both farms and about 12 ha were broken up. At Rothamsted this was followed by wheat but at Woburn some was resown to grass after fallowing. The remainder was left fallow as the couch was not killed in time to resow to grass.

Cattle

One hundred and fifty-eight cattle were sold fat from the two farms, and 177 yearling steers were bought.

Buildings and equipment

Refrigeration equipment was installed in the Rothamsted seed potato store to better control temperature. This allowed much more precise control of sprout growth and should lessen seasonal variation in the type of seed produced for field experiments. It was particularly valuable in preventing excessive sprout growth in the late 1979 spring.

Two old combine harvesters were replaced.

Staff

Dianne Grant left the Recorder staff. G. Onion and G.P. Bassett left and D. Reid was appointed. Mrs. J. Eaton left and was replaced by Mrs. J. Hurst.

https://doi.org/10.23637/ERADOC-1-136