ROTHAMSTED RESEARCH

Report for 1968 - Part 1

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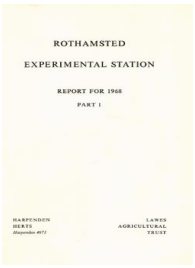

The Farms : Woburn

J. R. Moffatt

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October 1967 and August 1968; 72 young Hereford bullocks were bought in autumn 1968. In December 31 of the most forward cattle were yarded for fattening, and 46 were left out to eat the potatoes damaged by water when the barns were burnt.

All the young cattle were treated in November with an organophosphorus insecticide against warble fly.

Sheep. In October 1967, 218 ewes, mainly Scotch Half-breds, and 20 home-bred ewe lambs, were mated after flushing on new seeds, to Suffolk rams. Very little hay was needed until early in January 1968, and concentrates were fed in gradually increasing quantities from 9 January. Lambing started about mid-March and was favoured by cold, dry weather, but there was little early grass. There were 351 lambs alive on 1 May, giving a lambing percentage of 147. There were some deaths from pulpy kidney and nematodirus but most lambs did well and the first were sold before the end of May. There were 53 unsold at the end of the year.

The ewes were injected before lambing with a combined vaccine to protect them and their lambs against clostridial diseases. Ewes and lambs were sprayed against sheep maggot fly, and lambs were dosed regularly against worms.

In autumn 1968, 50 young Half-bred ewes were added to the flock to replace culls, as were 2 Suffolk rams. The ewes were flushed on fresh grass before mating in mid-October. Hay was not fed until snow fell at Christmas, and as the ewes were in rather poor condition concentrates and brock potatoes were fed before the end of the year.

Buildings

A new timber-framed barn with a lean-to cattle shelter each side was built on Scout Farm.

WOBURN

At Woburn the year was almost as disappointing as at Rothamsted. At first work was up to schedule and in a dry spring all crops were drilled early under good conditions. The summer was dull and damp; each of the 8 months from May had less sunshine than usual, and the total for the year was 303 hours fewer than average. Each of the 7 months from April had more than average rain; the total for the year, 27·52 in., was 2·8 in. more than average and rain fell on 172 days. Grain yields were small partly through lodging and disease, but mainly because proportion of grain to straw was small. The haulm of the potatoes died very early but yields were reasonable. Shortage of pickers and bad weather meant some were still in the ground at the end of the year; also much land was still not ploughed.

The effect of weather on crops

In January the weather was variable, with rain, sleet, snow and hard frosts alternating with spells of mild weather. Little land work was done.

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February was dry with little more than half the average rain, and 25 frosts. In a few fine days in mid-February one field of beans was drilled; frosts prevented further work until almost the end of the month, but enabled dung to be ploughed in on 7 acres for potatoes.

In early March strong winds dried the ground and good seedbeds were obtained. All spring beans and cereals were sown by 11 March; a fine spell allowed the sugar beet to be drilled, and fertilisers to be applied to grassland and for potatoes. Potato planting started and continued almost without interruption until it was finished on 24 April. Conditions in spring could hardly have been bettered.

May was mainly cold, windy, dull and wet, with air temperature 2·5° F less than average and 38 fewer hours of sunshine. However, the crops needed the 2·17 in. of rain and grew rapidly. Wind and rain interfered with the spraying of herbicides but all cereals were sprayed.

In June, fine spells alternated with dull, cool ones. Heavy storms early in the month caused the rye, some barley and much of the grass for hay to lodge. However, most of the hay was made and carted before the weather deteriorated towards the end of the month. There were 3·05 in. of rain.

July was cool, dull and wet; the mean air temperature was 2·3° F below average, 61 hours of sunshine fewer and nearly double the rainfall (4·28 in.). Nearly 2 in. fell on 10 July and caused both sheet and gulley erosion. Most of the barley not already flat became badly lodged, and some winter wheat lodged. A little hay, cut late, became badly weathered and was burned. The weather interfered with the spraying of potatoes.

August was dull with 66 hours of sunshine fewer than average, and the first part was also wet. A fine spell later enabled the cereal plots to be harvested. Yields were small. Fortunately, all cereals and beans were harvested by the middle of September, for the second half of the month was very wet; 4·25 in. of rain, more than twice the average for September, fell in 19 wet days. Potato lifting could not start until 23 September; it continued in reasonable conditions in early October, but rain then again delayed lifting, which became very protracted with wet ground and few pickers. November was mainly mild and damp, and the winter-wheat experiments were drilled by the middle of the month. The first half of December was dry enough for sugar beet to be lifted, and some land ploughed.

Field experiments

There were 1662 field plots, 300 more than in 1967, and about 700 micro-plots. All experiments were sown in good time. The badly laid corn caused some difficulties at harvest, and the grain from some plots where the cutter-bar had to be set very low, contained a lot of soil; some samples were sieved to correct the field weights. The modern combine used expedited the work, but most of the small plots were cut with a small PAM combine designed for plot work

Barley in experiments yielded about 20% less than usual and wheat about 30% less. Although this can be partly ascribed to an early attack of mildew, and, with barley, severe lodging, the main cause was probably

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lack of sunshine. This is suggested by the fact that the grain/straw ratio was unusually small. Grain usually weighs more than straw, but this year it did not: results of experiments in which the straw was weighed showed that 1 ton of barley straw gave 17 cwt grain and 1 ton of winter-wheat straw gave 16 cwt grain. Barley yielded most with about 0·4 cwt N/acre, and winter wheat with 0·8–1·0 cwt/acre. Lodging on the Barley Variety and the Deep-drilled Fertiliser experiments was so early and complete that the results can be of little value.

The bean experiment testing *Rhizobium* strains became very weedy despite spraying with simazine, but gave a satisfactory mean yield of 28 cwt/acre. In the Market Garden experiment the simazine worked better; leaf diseases were less severe and the beans grew very tall. They were rather slow to ripen and were not harvested until 19 September. Harvesting proved difficult but the mean yield exceeded 30 cwt/acre.

The experiment on the control of motley dwarf in carrots was sprayed with linuron, but too late to control mayweed, which grew rapidly in the rows and diminished yields before it was hand-pulled.

Grazing on the Ley-Arable experiment started in mid-April; the first-year leys were first grazed on 17 June. Grazing was almost continuous until the sheep were removed in mid-October, and grass was so abundant that the usual late-season nitrogen was not given. The first-year sainfoin was damaged by pheasants and needed patching; only one cut was taken. The second-year was cut twice and was sprayed with paraquat after each cut to kill the grass weeds. The third-year crop was abandoned after only one cut, because it was thin and weedy. The carrots germinated evenly and grew well; they were sprayed, post-emergent, with linuron against weeds, and twice against the aphid vector of carrot motley dwarf virus. The mean yield exceeded 34 tons/acre. The rye was badly lodged by storms in June but yielded over 31 cwt/acre.

Because of the small potato yields in 1967 (mean yield 6 tons/acre), the plots were split to see the effect of fumigation with chloropicrin. The plants on the treated plots were far more vigorous and yielded more than 20 tons/acre, whereas the untreated plots yielded 13·7 tons/acre.

For the first time in the history of the Ley–Arable experiment, barley was grown as both first and second test crops. Both yielded less than 30 cwt/acre; in both 1966 and 1967 the mean yield exceeded 42 cwt/acre.

Potato experiments presented no difficulties. All the Majestic and King Edward seed was 'A' stock from Northern Ireland; the Maris Piper was once-grown at Woburn. The Majestic was a poor stock and produced a very gappy crop. Lifting started on 23 September and finished on 4 October. Yields were generally better than in 1967. In the Intensive Cereal experiment, on the site of the old permanent wheat and barley experiments, the potatoes yielded more than in the past two years and the difference in yield between the old wheat and barley sites narrowed to 3 tons/acre.

Sugar beet had a good start, and grew well throughout the season. One spray against aphids was given. The roots were of good size and shape. With adequate fertiliser, yields exceeded 20 tons/acre; sugar content averaged 15·5%.

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Cropping

Of the 172 acres farmed 40 carried wheat, 15 barley, 22 potatoes, 29 beans and 2 sugar beet. There were small areas of sainfoin and carrots. Temporary grass occupied 26 acres and permanent pasture 16 acres. There were 21 acres of fallow.

The light land is worked on a six-course rotation, and the heavy land on a four-course, to provide different intensities of soil-borne pathogens of cereals and to prevent those of potato and sugar beet reaching dangerous populations. 'Break' crops are potatoes, beans, ley or fallow.

About 50 acres of stubble were sprayed with paraquat to kill volunteer corn and control grass weeds. About 18 acres were sprayed with amino-triazole to control couch grass.

Magnesian limestone was used to lime the light soil, and ground carbonate the heavy land.

Crops

Wheat. The larger acreage of wheat was sown to Cappelle in October, and there was a lot of gulley erosion following the heavy rain soon after sowing. N top-dressings were given in April and the crop grew well throughout the summer despite a severe attack of mildew. Lodging was patchy, yields smaller than usual, and quality poor.

Barley. Maris Badger, the only variety grown, was sown early and in early spring looked more uniform than usual, but showed its usual yellowish tinge in May. Lodging began in June and became severe in July and August. Most of the crops were badly affected by mildew. Yields were much less than usual and quality was poor.

Beans. Both Tarvin and Maris Bead were sown early and grew well initially. They were sprayed with simazine, which had little apparent effect on the weeds. The failure was first thought to reflect lack of rain, but even after ample rain the weeds seemed unaffected. Weeds were partially controlled by inter-row cultivations but many remained in the rows. There was considerable difference in growth between different sites; on one area that could not be chalked before drilling, the crop lost its colour and vigour in May, on other areas the plants grew vigorously. Most areas were sprayed with 'Metasystox' to control aphids, but the precaution proved unnecessary. Yields varied according to the vigour of the plant; some were much less than usual.

Potatoes. The main varieties grown were King Edward and Maris Piper with a few Majestic and Pentland Dell. Most of the seed was grown in Northern Ireland, but the Maris Piper was grown at Woburn; all seed was chitted. They were sprayed with a linuron/paraquat mixture which controlled weeds well, but all areas were grubbed and earthed up by rotoridger. The plants grew well in the wet weather which interfered with spraying. Towards the end of July they began to lose colour and by early August

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most of the haulm was dead. Acid was used mainly to control weeds before lifting. On one area burnt off with acid weeds later grew freely and were destroyed by paraquat in mid-November. The Maris Piper yielded about 10 tons/acre but the tubers are small; the King Edward yielded about 14 tons/acre total produce. There was little tuber blight and less common scab than usual. Many of the Majestic tubers rotted in the ground on water-logged areas.

Grass. In mid-March 3 cwt/acre of a high N compound fertiliser was given to all fields. There was little growth until mid-April, but from mid-May onwards there was ample for the stock. Grass for hay was badly laid but a flail mower cut it satisfactorily. All was cut, made, baled and carted within 8 days; both yield and quality was good. All fields were tipped by a rotary mower. In September several acres of grass containing a lot of mature docks were sprayed with 'Asulox'.

Livestock

Twenty-seven bullocks, most bought in the autumn, were yarded in November 1967 and were sold fat from mid-January onwards. They were fed on hay and brock potatoes or sugar-beet tops, with a ration of home-grown concentrates. They gained about 1½ lb/day.

Thirty-two younger bullocks were bought in spring and a further 20 in summer. All cattle were treated in autumn with a systemic organophosphorus insecticide against warble larvae. Those bought in spring were yarded at the beginning of December and the remainder were out-wintered.

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