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Report for 1960

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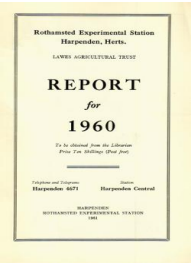
Rothamsted Experimental Station
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LAWES AGRICULTURAL TRUST

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The Farms : Rothamsted

J. R. Moffatt

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THE FARMS

J. R. Moffatt

Rothamsted

The year started with field work well forward as a result of the favourable conditions throughout 1959. The spring and early summer were likewise favourable, but conditions then deteriorated. The hours of sunshine were below average in all except 2 months, and the total deficit for the year was 152·3 hours. In each of the 6 months July to December 1960 rainfall was well above normal, and the total for the year was 36·37 inches, the highest since 1927. Corn harvest was late, but conditions were not as difficult as in 1958, and yields were not seriously affected. Rain fell on nearly every day during October, November and December and totalled 14·60 inches, compared with the average of 8·35 inches. The soil became waterlogged, and field work completely stopped. At the end of the year most of the potato crop was still in the ground, almost no winter crops had been sown and very little land ploughed. Seldom, if ever, has field work been so far behind schedule.

The Effect of Weather on Crops

In the dry autumn of 1959 the field work suffered little interruption from the weather, and most of the ploughing was done by the end of November. The drilling of winter corn and beans for the 1960 crop started early, and was mostly completed by the end of October. Conditions were so good that the acreage of winter wheat was increased beyond that originally planned. A mild, wet spell in December 1959 and January 1960 stopped field work, but ploughing and dung carting finished in the early part of February. The winter was generally mild and damp, and with no prolonged spells of frost or snow.

Spring cultivations started in early March and, despite the few frosts, good seedbeds were obtained. Most of the corn and beans were drilled before the end of the month. On three areas of reclaimed woodland which had been ploughed late, drilling conditions were not good.

Sugar beet, kale and grasses and clovers were all sown before the end of April. Potato planting started late, and the tilths, especially on late-ploughed land, were rather rough. Strong, cold winds during April dried the ground, retarded growth and delayed herbicide spraying.

Warm, sunny weather in May and June facilitated the cultivation of root crops, herbicide spraying and the making of hay and silage. All crops made good growth and looked promising.

July was mainly dull and wet, with many heavy falls of rain, and temperatures well below normal. Cereals ripened slowly and lodged extensively, but root crops grew well. The wet weather continued throughout August, when rain fell on 17 days; lodging

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increased in cereal crops, and some of the lodged crops sprouted in the ear. Harvest started late, and was a slow, difficult operation spread over nearly 6 weeks. All the corn needed drying, as moisture contents varied between 20 and 24%, but though much of the grain was weathered, the yields were not much affected. The straw was brittle, and consequently of poor quality. Potato blight was very prevalent in July and August, and most of the haulms were burnt off at the end of August. Lifting started at the end of September.

The rainfall in October totalled 6·51 inches—3·55 inches above normal—and was spread over 28 days. This at first slowed down, and then completely stopped, potato lifting. Ploughing was delayed, and it became impossible to sow winter wheat or beans. The wet, cold weather continued until the end of the year. November's rainfall was 4·44 inches (1·65 inches above normal) spread over 28 days, and December's 3·65 inches (1·05 inches above normal) spread over 26 days. The land became completely waterlogged, and field work was impossible for long periods at a time. Sugar-beet harvesting was completed before the end of November, but the field was reduced to a slurry before carting was finished. Corn drilling and potato lifting were impossible, and at the end of the year most of the autumn work still remained to be done.

Field Experiments

The 1959–60 field experiments had an excellent start, and autumn-sown crops were drilled much earlier than usual. Favourable weather enabled the large spring programme to be completed, and all crops were sown in reasonable time. No crop failed, and damage by birds was slight. Despite the atrocious weather at harvest, all the cereal plots were harvested in reasonable condition, with less lodging than was expected.

Of the 10 potato experiments from which yields were required, six were lifted as usual with the elevator-digger. Conditions then prevented the further use of this machine, and on the other four experiments about a quarter of the area planned to be harvested by machine was lifted by hand. All dirt tares were higher than usual.

The sugar-beet plots were harvested under bad conditions, but the beet needed less cleaning than usual, as the water acted as a lubricant between the soil and roots.

Broadbalk, usually sown late to check the infestation of slender foxtail (*Alopecurus myosuroides*) and wild oats (*Avena ludoviciana*), was sown in perfect conditions in the middle of October 1959. 2 : 4-D ester was sprayed on the 1959 stubble of the permanent wheat section to control coltsfoot (*Tussilago farfara*), and this area was also sprayed in the spring with CMPP. These sprays gave good control of weeds, which were plentiful on the rest of the field and especially so on Section V, which also lodged worst.

Hoosfield permanent barley plots were sown late to check wild oats (*Avena fatua*). This policy of sowing late and hand pulling the wild oats is proving successful, and there were very few to pull this year. The spraying programme to control coltsfoot (*Tussilago farfara*) was continued as in 1959, except that, on strips 4, 6 and 7, CMPP was used instead of MCPA in spring because of the heavy

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infestation of chickweed (*Stellaria media*) and cleavers (*Galium aparine*). Three plots (50, 5A and 4C) were sprayed with dalapon against twitch (*Agropyron repens*).

Barnfield, the classical mangold field, was fallowed in preparation for a new experiment in 1962, though dung and fertilisers were applied as for a crop. Small isolated areas of twitch (*Agropyron repens*) were controlled by spraying with dalapon and frequent rotary cultivations, though these were restricted by bad weather. Spraying with 2 : 4-D ester against creeping thistles (*Cirsium arvense*) was confined to affected areas.

On the Park Grass plots the modified forage harvester described in the 1959 Report was used to determine the yield of the first " hay " crop. Four cuts were taken from the wide plots and two from the narrow ones; the rest of each plot was cut with a mower and made into hay. This sampling method eliminates losses unavoidable in haymaking and considerably expedites the work. The same technique was used for the second cut, except that after the sample cuts had been made the rest of the grass was cleared by the forage harvester working in the normal manner. These methods of harvesting the Park Grass plots are now accepted as standard practice.

Moles were again active on some of the Park Grass plots, and poison bait was used against them.

Cropping

Of the 462 acres farmed, 276 were under arable crops or fallow, 124 under short-term leys or lucerne–grass mixtures and 62 were under permanent grass. The main arable crops were wheat (112 acres), barley (65 acres), oats (14 acres), beans (31 acres), potatoes (34 acres), and kale, sugar beet and swedes (9 acres). 11 acres were fallowed.

The cropping system is largely dictated by the requirements of experiments, but is based on a rotation of wheat, barley and either roots or beans. The acreage of potatoes is as large as can be handled, and enough kale is grown for the needs of the stock until Christmas. The sugar-beet area is kept small, because our land is unsuitable, and the balance of the root break is sown to beans, as this crop makes little demand on labour. Arable fields are rested periodically under grass or lucerne–grass leys, which are usually left down for 4 or more years, depending on the state of the sward.

This system is flexible and represents a compromise between the often conflicting demands of experiments on pests and diseases that require uninfected fertile sites and experiments on fertilisers that require sites likely to show a good response to nitrogen. Cropping is further complicated by restrictions on the use of phosphate and potash on some fields. Several such areas are now in " cold storage " under long-term leys or fallow.

Crops

Cereals

Except in experiments, Cappelle was the only variety of winter wheat grown. Jufy I replaced Koga II as the standard spring

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variety because it yields more and stands better. Proctor remained the main variety of barley; Condor is now the standard oat variety.

The early sowing and mild winter favoured winter wheat. Spring corn had a good start; all cereals promised well at the end of June, and there was prospect of an early harvest. The weather soon changed this, for Cappelle in Highfield 4, 5 and 6, and some Proctor barley, became badly lodged. The lodged wheat grew in the ear, but as lodged crops were harvested when the straw was dry, losses were small.

The wheat averaged nearly 30 cwt./acre, barley 26 cwt./acre and oats 25 cwt./acre. The spring wheat was " Field Approved " and has been sold for seed.

All cereals were sprayed with herbicides with satisfactory results. CMPP, 2 : 4-D ester and TCB/MCPA were all used, the last more than usual, as it affects more of the weeds prevalent here.

Beans

The bean acreage was bigger than usual; some winter beans were damaged by birds and the crop was resown with spring beans. All spring and some winter crops were sprayed against weeds with " Simazine ". The effect in the dry spring was disappointing, and an inter-row cultivation was needed. A fairly heavy attack of bean aphis (*Aphis fabae*) on the spring beans was effectively controlled by one spraying with " Metasystox ". The crops continued to grow late in the season and were harvested in mid-September, though they were still soft. As usual, winter beans with a yield of about 34 cwt./acre, did better, except where damaged by birds, than the spring variety, which yielded about 23 cwt./acre.

Potatoes

The start of potato planting was delayed by about 2 weeks by the heavy programme of spring cereal experiments. With little frost, tilths were rather rough, especially on late-ploughed land, and some areas were rotary cultivated.

More King Edward VII and fewer Majestic were sown than previously; Ulster Supreme was used on three experiments. The crop was kept clean by inter-row cultivations, and earthed up by the end of June and sprayed before late blight (*Phytophthora infestans*) appeared in late July, but the disease spread quite rapidly, despite a second spraying. Most of the haulm was dying by the end of August, and was then burnt off with concentrated BOV.

The late corn harvest delayed the start of lifting until the end of September, after which conditions soon deteriorated. Yields were much higher than usual, 26 tons/acre from one experiment. The tubers were of good size and shape, almost free from common scab (*Actinomyces scabies*), even on areas where the disease is usually rife. Some of the tubers of the King Edward VII and Ulster Supreme but very few of the Majestic were blighted.

Sugar beet and kale

Both these crops were sown early in April and, after a rather slow start, grew well into the autumn. Beet, grown only on experi-

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ments, were sprayed with "Metasystox" to check sugar-beet yellows, and yielded 22 tons/acre, with an average sugar content of 15·3%.

Weeds, especially fat hen (*Chenopodium album*) and creeping thistle (*Cirsium arvense*), grew vigorously in the kale. Inter-row cultivations were hampered by the rain, and on some areas lowered the yield. A new herbicide was tested against weeds in kale and controlled fat hen well enough to justify further tests.

Grassland

The grassland was chain-harrowed and given its first fertiliser at the end of February. Early growth was retarded by cold winds and lack of rain in April. In May recovery from early grazing was slow because of the dry weather, and by the end of June grass was quite scarce. Top dressings of nitrogen and the heavy rain in July made the grass grow rapidly and, as cattle were being sold regularly, it grew ahead of the stock. Extra cattle bought in September and October strip-grazed a field of long grass, much of which would have been wasted under free-range grazing. Before the end of November they had to be moved into yards because of the condition of the land.

Cutting for hay started before the end of May; this early cut was heavy and of excellent quality, but crops were light on those fields which had been used for early grazing. The grass was bruised by the forage harvester immediately after cutting, which expedited drying; in one spell of good weather hay was baled and carted within 24 hours of being cut. Most of the hay was of good quality, though some was spoilt because it was cut when weather forecasts were sadly wrong. During a rare spell of fine weather in September, 8 acres of grass were made into hay. After bruising, the crop was turned and tedded repeatedly for 4 days, when it was baled and carted just before rain fell.

Weather in late May and June was excellent for silage making, and a very heavy first cut of lucerne and cocksfoot was ensiled at the end of May; the second cut, taken in early July, was made half into hay and half into silage. A third, heavy cut was ensiled at the end of September, as was other surplus grass and the second cut from the Park Grass plots. More silage was made than ever before, and the cattle found it very palatable.

LIVESTOCK

Cattle

The policy of buying 18-month-old store cattle in the autumn and fattening them during the following summer and autumn was continued. In the dry summer of 1959 the cattle did not fatten well, and 40 were brought into covered yards in the late autumn for finishing. Sixty-one Hereford and Hereford-cross bullocks, bought in the autumn of 1959, were kept in open yards throughout the winter. They were fed entirely on home-produced bulky foods and maintained their condition well.

Grazing became scarce in June 1960, and some cattle were transferred to Woburn. There was ample keep throughout the late

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summer and autumn, and the cattle thrived; altogether 100 cattle were sold fat, and all except the few retained for the Christmas Show went direct from grass. A further 83 dehorned Hereford-cross beasts were bought in the autumn of 1960. It was hoped that these would remain at grass until the end of the year, but the land poached so badly that they had to be brought into covered yards before the end of November. The yards, originally designed for 15 horned cattle, are now holding twice this number of dehorned beasts. They were fed on hay, straw, kale, sugar-beet tops and brock potatoes until towards the end of the year, when silage feeding started.

An organo-phosphorus insecticidal wash was used in the late winter of 1960 against warbles on store cattle; it worked fairly well on cattle with light coats, but less well on those with thick coats. The new store cattle were treated in autumn 1960, before they grew their winter coats.

Sheep

Flushing the ewes in 1959 on a lucerne–cocksfoot mixture was very successful. The ewes, all in their second breeding year, were in excellent condition at lambing, and most fed their lambs well. One hundred and thirty ewes put to the Suffolk ram produced 228 lambs, a percentage of 175. Several ewes suffered from prolapse of the uterus, and three Caesarian operations were done; all the ewes and most of the lambs survived, and only one ewe died during the lambing period. Rubber rings were used for tailing and castration.

The high lambing percentage gave more lambs than could be adequately fed at Rothamsted, or were needed for grazing plots in 1961. Consequently nearly 100 lambs were transferred to Woburn in September, and those sold fat were replaced by others. The remaining lambs at Rothamsted are being fattened as rapidly as possible to clear the farm of all sheep other than the breeding ewes. Two ewes were culled in autumn, and the 122 remaining were flushed on good grass.

Now that the Sheep Dipping Orders in Hertfordshire have been rescinded, a spray-race is used in place of the dip. All sheep were sprayed with a special preparation of dieldrin, about 10 days after shearing. They were run through the empty race twice for training, and the actual spraying caused little difficulty. They were sprayed again later in the season. This method of combating the sheep-maggot fly (*Lucilia sericata*), which saves much time, labour and loss of temper, seems as efficient as dipping.

Equipment

The storage capacity of the grain-drying and storage plant was increased by 80 tons by building five more galvanised-steel bins. The installation of a 10-ton bulk loading bin, complete with elevator, brought the storage capacity of the plant to 280 tons. A new high-capacity precleaner was installed.

A 70-inch rotary cultivator with a variable rotor speed, a tractor-mounted sprayer suitable for handling concentrated acid (BOV), and two tractors were bought.

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Buildings and Roads

A timber-clad cattle shelter was built in Highfield.

The concrete apron around the farmstead was extended to serve all the implement sheds.

The racks and troughs of the two cedar-wood covered yards, designed for feeding hay and concentrated foods, were modified to facilitate the feeding of kale and silage from trailers, without entering the yards.

Estate Work

In addition to mechanical hedge-cutting and other routine estate maintenance, the work of clearing the old woodland areas of Claycroft, Longcroft and Appletree field, started in 1959, was completed. These areas were ploughed in late spring and sown to cereals; two of them produced satisfactory yields, but the crop on the third area was partially smothered by grassy weeds. The shelter belt of poplar trees parallel to the Redbourn Road was thinned, and the trees in Broadbalk Wilderness which overhung Broadbalk field were lopped.

Woburn

Woburn suffered less than Rothamsted from the unfavourable weather. The autumn of 1959 favoured the early sowing of winter wheat and beans, and field work was up to schedule at the beginning of 1960. Ploughing was delayed by the wet winter, but conditions were excellent in spring, and all cereals and beans were sown before the end of March. April was very dry, which favoured the drilling of sugar beet and kale and the planting of potatoes, but retarded germination and growth of most crops; the heavy land also cracked badly. Crops grew well in May and June, though the sugar beet germinated unevenly. A heavy storm in late June benefited the root crops but lodged some wheat and barley. Heavy rain in July delayed the ripening of cereals and increased lodging. Harvesting was delayed by rain throughout August and September, and potato blight (*Phytophthora infestans*) spread rapidly. All experimental potato crops were lifted before the end of September and sugar beet soon afterwards, but the harvesting of the non-experimental potatoes and sugar beet was interrupted by the wet autumn, and some sugar beet was still in the ground at the end of the year. Ploughing was delayed, and no crops had been drilled by the end of the year.

Cropping

Of the 127 acres farmed, 27 carried wheat, 25 barley, 9 beans, 19 potatoes and 6 sugar beet. There were small areas of kale, carrots, lucerne, rye and market-garden crops. Temporary grass occupied 22 acres and there were 4 acres of permanent grass.

Crops

Cereals

The winter wheat on all non-experimental fields was Cappelle and the spring wheat Jufy I. Herta barley was retained on the