ROTHAMSTED RESEARCH

Report for 1961

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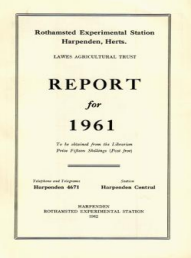

The Farms : Rothamsted

J. R. Moffatt

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THE FARMS

J. R. MOFFATT

Rothamsted

In contrast to 1960, 1961 started with field work very seriously behind schedule. The mild and extremely wet autumn of 1960 made it impossible to drill much winter corn or beans, and 1960 ended with most of the potato crop still in the ground and very little land ploughed. The mild, wet weather continued into 1961, and hope for the 1960 potatoes was almost abandoned. However, in a fine spell in February some of the leeway was made up; potatoes were lifted, land was ploughed and some winter wheat sown. The early spring brought a welcome spell of dry weather, and land work forged ahead. The late ploughing, the lack of frost tilths and the lashing by rain, all combined to make it difficult to obtain good spring seedbeds. The summer was dry and field work was seldom interrupted. Crops grew well and conditions for harvesting cereals and roots were good. By the end of 1961, all winter cereals and beans were well through the ground and ploughing was almost complete.

THE EFFECT OF WEATHER ON CROPS

The autumn of 1960 was so wet that no winter beans were drilled and only a few small experimental areas of winter wheat; very little land was ploughed. January and early February 1961 continued mild and wet, but then in a 2-week spell of dry weather ploughing was continued and about 20 acres of winter wheat were sown. During March rain fell on only 5 days, and good progress was made. As a result of the late ploughing the soil was in a raw, unweathered state, and seedbeds were obtained only by many disc harrowings and rollings, but even then they were "cobbley". Most of the corn was drilled before the end of March, by when strong winds had dried out the ground, so the rain in early April was needed. The wet spell was prolonged, and the rain in April was 1·15 inches above average and fell on 21 days. This curtailed cereal spraying with herbicides, and potato planting, which was not finished until mid-May.

May was dry, with periods of strong winds. Spraying was further delayed, and the unkind soil dried into hard lumps which conventional implements could not break down. A rotovator produced satisfactory seedbeds, which might have been better had it been used direct on the ploughed land. Field work was up to date by the end of the month.

June and July were dry; the total rain for May, June and July was 2·8 inches below average. Weeds were easily controlled, silage and most of the hay was made under good conditions, and cereal crops maintained good growth throughout the period.

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Rain fell on 18 days in August, and harvest work went on intermittently; a fine spell at the end of the month enabled the work to be finished early in September, but most of the corn had to be dried. Ploughing started early, and the ground ploughed up extremely well.

As there was very little late blight, potato haulm remained green until towards the end of September, and lifting conditions in October were good. Sugar beet continued to grow until they were lifted in November. Wheat drilling started early in October, and all winter wheat and winter beans were sown by mid-November. In December weather was very variable; spells of hard frost and heavy rain were interspersed with very mild spells. Frost was recorded on 12 of the 13 days between 17th and 29th, the hardest being 20° on the ground on the 29th. The year ended with a blizzard, during which 14 inches of snow fell.

By this time all the wheat was through the ground, the beet had all been cleared, dung had been ploughed in on 15 acres and most of the other ploughing was finished.

Field Experiments

The 1960/61 field experiments had a bad start because of the wet autumn and winter; many of the dates of planting had to be altered considerably, and spring wheat replaced winter wheat in several experiments. The heavy spring planting programme started in good time, but did not finish until mid-May; only one experiment had to be abandoned. All crops grew well, and damage by birds and other vermin was negligible, except in the High Field Ley–Arable experiment. No corn plots were lodged, and harvest conditions were reasonable; both potato and beet harvests were taken without difficulty, under excellent conditions. The modified forage harvester enabled 370 cuts from grass plots to be made quickly and efficiently.

Broadbalk is usually sown late to destroy, by cultivations, the initial germination of slender foxtail (*Alopecurus myosuroides*) and wild oats (*Avena ludoviciana*). The conditions in autumn and winter of 1960/61 were such that no satisfactory cultivations were possible before drilling in mid-January, and a very heavy infestation of slender foxtail resulted. The few wild oats were all pulled in 32 hours. The permanent wheat section was sprayed with TCB/MCPA. Weeds were plentiful on the rest of the field, especially so in Section V. The plant was regular but thin, and yields were below average. There was a good autumn germination of slender foxtail, so after cultivations the seed for the 1962 crop was drilled under excellent conditions early in November.

Hoosfield barley plots were sprayed twice with dalapon in autumn 1960 to control twitch (*Agropyron repens*), and in the autumn of 1961 only a few areas needed to be sprayed again. MCPA was used in spring on strips 1, 2 and 3 to control coltsfoot (*Tussilago farfara*), but strips 4, 6 and 7 were sprayed with CMPP, as the predominant weeds were chickweed (*Stellaria media*) and cleavers (*Galium aparine*). Only a few stunted coltsfoot plants survived. The policy of sowing the barley late, combined with hand

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pulling of wild oats (*Avena fatua*), was continued; its success shows in the fact that all the wild oats present were pulled in 16 hours.

The new method of harvesting the Park Grass plots described in the 1960 Report was again used, and saved much time and labour.

The Hoos Half Acre wheat and fallow reverted to normal cropping after being modified for 4 years to facilitate studies on the wheat-bulb fly (*Leptohylemyia coaretata*).

Barnfield, the classical mangold field, was fallowed a second time in preparation for a new experiment in 1962; dung and fertilisers were applied as for a crop. Repeated rotary cultivations were given to eliminate any twitch still present.

The Exhaustion Land was sprayed in autumn 1960 with dalapon against twitch, and only plots 5 and 6 and part of 2 needed spraying in 1961.

Cropping

Of the 463 acres farmed, 297 were under arable crops or fallow, 104 under short-term leys or lucerne–grass mixtures and 62 were under permanent grass. The main arable crops were wheat (88 acres), barley (94 acres), oats (9 acres), beans (36 acres), potatoes (28 acres), and kale, sugar beet and swedes (13 acres). 29 acres were fallowed.

The cropping depends upon the requirements of the field experiments, both immediate and future, but the rotation is based on wheat, barley and either roots or beans. Potatoes are the main root crop, as sugar beet is unsuitable for our land and little kale is needed; the balance of the root break is sown to beans, which make little demand on labour. Arable fields are rested periodically under grass or lucerne—grass leys, which are usually left down for about 5 years.

This system is flexible and represents a compromise between the often conflicting demands of experiments on pests and diseases, which require uninfested fertile sites, with experiments on fertilisers, which require sites likely to show a response to different forms of any one fertiliser. Many fertiliser experiments can be catered for only by keeping some areas deficient in some nutrients; as these areas are seldom worth cropping, they are mainly kept under long-term leys or fallow.

Crops

Cereals

Most of the Cappelle and Professeur Marchal winter wheats were not sown until well into the New Year, and several areas were sown as late as mid-February. In one experiment, drilled on 13 February, three winter varieties each yielded over 50 cwt./acre at the highest level of nitrogen. Another experiment compared winter and spring wheats, both sown on 15 February; Cappelle gave a mean yield of 45·8 cwt./acre, and Jufy I a mean of 43·3 cwt./acre. The sowing of most of the spring wheat was delayed by weather until early March, but before the end of May it was better than the winter wheat, which at one stage looked as though it lacked vernalisa-

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tion and might not come into ear. However, by mid-June the crop looked normal, and it came into ear about the end of the month.

The Jufy I spring wheat and the Proctor barley mostly went into rather rough seedbeds, and growth was retarded by the drought and cold winds in May. The barley, in particular, was uneven in growth and was yellow in patches, but all crops looked satisfactory by the end of June. They ripened evenly, and the quality and germination of all crops was excellent. The wheat averaged over 40 cwt./acre and barley about 40 cwt./acre.

All the cereals were sprayed with herbicides, mainly CMPP and TCB/MCPA. Spraying was delayed by rain and strong winds, but was quite effective.

Beans

All the spring beans were sown during March or early April, and most of the areas were sprayed immediately with simazine. They grew well in early summer and were sprayed with " Metasystox " to control bean aphis (*Aphis fabae*). As the dry weather continued into July, the plants lost vigour, though the set of pods seemed reasonable; they ripened earlier than usual and yielded about 25 cwt./acre.

Potatoes

During the year we harvested two crops—the 1960 crop in February and March, and the 1961 crop. The Majestics of the 1960 crop were mainly sound, but were caked with mud. The King Edwards and the Ulster Supreme, also very muddy, were damaged by blight and secondary rots. Most were sold to the Potato Marketing Board, but they were not required as ware, so sorting was not the problem it might have been.

The few early varieties were planted towards the end of March, but the start of maincrop planting was delayed until mid-April, and was not finished until the second week of May. Satisfactory tilths were obtained by using the rotovator. Majestic and King Edward VII were the main varieties, though there were a few Ulster Supreme. Drought restricted growth in the early stages, but the plants grew vigorously during July, August and September. Few cultivations were needed to control weeds, and there was little blight. The King Edward and Ulster Supreme were given a precautionary spraying, but the Majestics were not sprayed. The haulm was burnt off with concentrated BOV in late September, and lifting started towards the end of the month. Conditions were ideal until towards the end of the operation. The tubers were of nice size and shape, but there was some slug damage to the King Edwards. Both varieties yielded well considering the dry summer, the King Edwards giving about 15 tons/acre total produce and the Majestics rather more. Towards the end of picking stillages were used instead of sacks. These were loaded in the field, and unloaded and tipped at the farmstead by a special head fitted to the fore-end loader mounted on a tractor. This system requires fewer men for carting and stacking, and does less damage to the tubers.

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Sugar beet, kale and swedes

These crops were all drilled early. Initially sugar beet grew slowly, and the shortage of labour made singling a protracted operation. The crop grew well in the late summer and autumn. The average yield was 16 tons/acre, with an average sugar content of 16·3%.

Both swedes and kale grew well, and weeds were easily controlled by a few cultivations. Very satisfactory yields were obtained.

Grassland

Pastures grew well in early March, but growth was slowed later by cold weather. Rapid growth was resumed in April, and cattle were turned out between 20 and 24 April. Cutting grass for silage started on 24 May, immediately corn spraying and potato planting was finished. Conditions were excellent, and the silage was of good quality.

The hay crops were lighter than usual, as recovery from early grazing was slow. Cutting started on 25 May, and most of the hay was made and carted in excellent condition. The lucerne–cocksfoot mixture gave three heavy cuts, the first and last of which were made into silage and the other into hay. All crops were bruised immediately after cutting by a forage harvester fitted with special blades. This accelerated the loss of moisture, especially from the stems of the lucerne plants.

The dry weather in May and June slowed down the growth of pastures and " keep " became scarce. Two applications of nitrogen improved the growth, especially after the rain in mid-July; at no time during the summer was grass plentiful, and the seeds undersown in the cereal crops proved invaluable in the autumn.

Livestock

Cattle

Eighty-three store cattle, bought in the autumn of 1960, were wintered in covered yards, and from January on were fed mainly on silage. In the dry summer the cattle kept the grass closely grazed, and when " keep " became scarce in early June some were transferred temporarily to Woburn. All but 12 of the cattle were sold fat by the end of December. Supplementary food was given after mid-October.

A further 63 young cattle were bought in autumn 1961. Silage was fed to them at grass from mid-November; in December they were brought into covered yards and fed on silage, brock potatoes and kale, with a little hay and straw, and a small allowance of home-produced concentrates.

The organophosphorus insecticidal wash used on the 83 young cattle in autumn 1960 against warbles was very effective. Of the 53 examined in April 1961, one had 2 mature grubs, and 3 had one mature grub each. All young cattle were treated in November 1961.

Sheep

The flock of 122 ewes was flushed on good grass before tupping in October 1960. The feeding of concentrates started 6 weeks before

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lambing, and was gradually increased until the ewes were getting 1 lb. per head per day at the start of lambing. The ewes were in excellent fettle at lambing, when weather was good. There was a very good fall of 228 lambs, which gave a lambing percentage of 187. Two ewes died in the lambing field, and 3 lambs died from Pulpy Kidney disease, which made it advisable to inoculate all the lambs. The sale of fat lambs started early in June; 88 lambs needed for grazing experiments were sent to Woburn for over-wintering, and the balance was sold before the end of the year.

After drafting, 111 ewes remained in the flock, and to these 27 gimmers of our own breeding were added; these were flushed in autumn 1961 on undersown seeds. The feeding of hay started during the hard frosts about Christmas.

In the autumn the ewes were injected with one of the new combined vaccines to give immunity to a wide range of diseases, and they will be vaccinated again shortly before lambing. They were also dosed with a nematicide.

Equipment

New cattle- and sheep-handling pens include a cattle crush and weighbridge, a sheep spray race, dosing and drafting races, and footbath pens.

Buildings and Roads

About 1,400 yards of uneven tracks leading from the farmstead were made into gravel roads, and the area of concrete at the farmstead for parking cars was extended.

Staff

Mark J. Hill left in May on appointment as farm manager to Lord Belper. Roger Moffitt replaced him in July.

Woburn

Woburn also had a mild, wet autumn and winter, but with less rain than at Harpenden field work was less disrupted. However, no winter corn was sown and little land was ploughed by the beginning of the year. During the fine spell in February the ploughing was completed and spring beans sown. With only 4 rainy days in March, spring-corn sowing was finished by the end of the month. Seedbeds for all crops had to be forced, as the early ploughed land was badly lashed by rain and the late-ploughed dried rapidly into rock-hard clods, and the rotovator was invaluable for the purpose. By the end of March field work had got as far as was possible with the existing soil conditions; the early, and some of the maincrop, potatoes were planted, and some sugar beet was sown.

The welcome rain early in April softened the clods, which worked down into good seedbeds for sugar beet and carrots. The rotovator was needed again to prepare some heavy ground for potatoes, but planting was finished by the middle of the month. May was dry, but all crops grew well. Two wind frosts on 27 and 28 May severely

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