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ROTHAMSTED RESEARCH

Rothamsted Report for 1967

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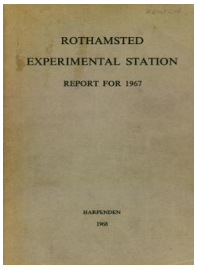

The Farms : Woburn

J. R. Moffatt

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January 1967, and concentrates were fed from 18 January. Lambing started about mid-March, and although the first lambs were rather small and weak, those born later did well in the dry weather. There were 285 lambs alive on 1 May, giving a lambing percentage of 161. The single lambs and triplets were creep-fed until weaning, when all were trough-fed. The first lambs were sold on 22 May, and all but 38 were sold fat by 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.

Sixty-six half-bred shearlings were bought in autumn 1967. Nine home-bred shearlings and 20 lambs were kept to bring the flock to 238. They were flushed on new seeds and were mated in mid-October. As there was plenty of grass, very little hay was fed before the end of the year.

WOBURN

Despite the wet autumn, field work was well forward at the start of 1967. The winter was mainly mild and wet. During a long fine spell in spring, beans, cereals and potatoes were sown, but a wet May delayed land work. The summer was mainly dry and hot; some excellent hay was made, but other crops on the lighter land suffered. Cereals and potatoes on some areas yielded little. In the dry September and early October, potatoes and sugar beet were lifted and some land was sub-soiled; most of the winter corn was drilled before the ground became too wet, and much land ploughed. Late autumn was wet, but at the end of the year field work was up to schedule.

The effect of weather on crops

The many hard frosts early in January made possible several jobs left over from 1966. Dung was carted and spread, chalk was sown and ploughing finished.

In a dry, mild spell early in February some seed-beds were prepared and some wheat and beans sown. Rain then stopped work until early March, when the ground dried rapidly, and all spring cereals and beans were sown by 20 March. Rain in April interrupted potato planting, which nevertheless finished earlier than usual.

May, cold, dull, windy and wet, gave 4·27 in. of rain, almost twice the average, in 22 days. Little land work was done, and the spraying of herbicides on cereals and potatoes was delayed.

The weather improved in June; rain fell on only 5 days at the end of the month. Hay was cut early in June; no rain fell during its making or carting and yields were big. In July the weather was mainly fine and dry, with more sunshine than usual; occasional storms caused some corn to lodge.

August had an inch less rain than average, but it was spread over 16 days mainly early in the month. This delayed the start of harvest, which finished on 4 September.

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September had 19 wet days, but as the soil was dry the potatoes were lifted without difficulty. Dry weather in early October facilitated subsoiling after corn and potatoes, and sugar-beet lifting. The latter part of the month was wet; 4·5 in. of rain fell in 21 days, but wheat drilling and sugar-beet lifting finished before the ground became too wet. Rain in early November delayed land work, but, with better weather later, chalk was sown on several areas, an extra field was drilled with wheat and much land was ploughed. In December the weather was very mixed.

Field experiments

There were 1327 field plots and almost 800 microplots. The full programme was completed. The 5-ft-wide self-propelled PAM 150S combine-harvester was used to cut several experiments with small plots.

In the Direct-Seeding experiment there was a good plant of winter wheat on the ploughed plots, but on the direct-seeded plots there were many gaps, partly caused by slugs. Moles were troublesome on this area, and many were trapped. Yields were big; the ploughed plots averaged 59 cwt/acre and the direct-seeded plots 45 cwt.

Grazing on the Ley–Arable experiment started about the usual time in mid-April; the first-year leys were first grazed on 5 July. There were fewer grazings than in 1966. The rye ground was badly lashed by the heavy rain in autumn 1966 and severely eroded. The crop was killed with paraquat in February, cultivated and the plots drilled with Kloka wheat. Most of the plots yielded more than 30 cwt/acre, but the arable/hay plots which were damaged by birds gave half this yield. The carrots germinated evenly and grew well; they were sprayed, post-emergent, with linuron, against weeds, and three times with "Metasystox" against the aphid vector of carrot motley dwarf virus. The mean yield exceeded 34 ton/acre. The potatoes looked satisfactory at first, but in June they grew slowly and became irregular and yellow. Yields from the arable rotations were much less than from the ley or sainfoin rotations. The second- and third-year sainfoin was sprayed with paraquat to kill annual meadow grass (*Poa annua*) and chickweed (*Stellaria media*). These crops were cut twice, but the first-year crop only once. The barley was slightly laid and averaged 43 cwt/acre. The sugar beet looked promising all the season, and despite a late attack of sugar-beet yellows yielded more than 18 ton/acre.

The Maris Piper potatoes in the Cultivation–Weedkiller experiment, in its final year, were extremely poor. The haulm began to die in mid-July, and the ground was quickly covered with mayweed (*Matricaria inodora*). The yield of total tubers was only 4 ton/acre (in 1966 17·8 tons), and most were small and badly scabbed. The barley gave even and significant increases in yield to three amounts of N.

In the Market Garden experiment bad weather prevented the use of a pre-emergent spray, and delayed the post-emergent one until the weeds were several inches tall. The linuron was slow to act, but eventually killed most of the weeds, though the dead groundsel (*Senecio vulgaris*) had to be hand-hoed. Had not the spraying been done, the crop would have been smothered by weeds before the ground was dry enough for mechanical

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operations. After this initial check the crop grew satisfactorily and yields on different plots differed widely. The crop was sprayed twice with "Metasystox".

The Majestic potatoes in the organic manuring experiment grew slowly and looked unsatisfactory; they died early, and yields ranged between 5 and 9 ton/acre total produce.

In the second year of the Intensive Cereal rotation experiment, on the site of the old permanent wheat and barley experiments, the potatoes on the barley area again gave double the yield of those on the wheat ground, though all treatments were similar. Grass again yielded more on the barley site, and the barley on its site again outyielded the wheat on its site.

Cropping

Of the 172 acres farmed 27 carried wheat, 22 barley, 16 potatoes, 17 beans and 2 sugar beet; there were small experimental areas of sainfoin and carrots. There were 36 acres of temporary grasses and clovers, and 15 acres of permanent grass.

A six-course rotation was introduced on the light land, and a four-course rotation on the heavy land. These provide land with different intensities of soil-borne diseases of cereals, and prevent potato and sugar-beet pathogens reaching dangerous populations. On the light land the "breaks" between cereal crops are potatoes, fallow or a ley; on heavy land beans are an additional "break" crop.

About 30 acres of fallow were subsoiled to a depth of 20–24 in. during the summer; several stubble fields were done after harvest, as were some areas after potatoes. Altogether 68 acres were done during the year.

Several areas were sprayed after harvest with aminotriazole against twitch (*Agrostis gigantea*).

Magnesian limestone was used this autumn for all routine liming; this will be standard practice.

Crops

Wheat. The small area of Cappelle winter wheat grown was sown early, and with 75 units of N in spring, yielded about 40 cwt/acre.

Most of the wheat area was sown to Kloka spring wheat with about 75 units of N. It grew well at first, but on the light land the leaves died towards the end of July, making the crop look rather thin, and yield was small. On the heavy land yield was about 35 cwt/acre. To avoid shedding, the wheat was cut before the barley was finished.

Barley. Maris Badger, the only variety grown, was sown early; it became yellow and uneven in May, but improved later, though it remained rather uneven. This yellowing seems to occur in most years. Some of the crops were laid or battered by storms, but the main barley field yielded about 35 cwt/acre.

Beans. Tarvin spring tic beans were sown early, some in mid-February. Rain delayed spraying with simazine for over a week, but other areas were

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done immediately after drilling. Emergence was uneven, especially in the tractor-wheel tracks. The crops grew rapidly during the summer and were sprayed in June with a systemic insecticide against bean aphis (*Aphis fabae*); they were sprayed again in July, by aeroplane, to control a late infestation. By the end of July they were almost 6 ft tall and the lower leaves began to fall. They were cut in late August and early September; the average yield was about 30 cwt/acre.

Sugar beet. This was grown only in experiments; drilled at the end of March, a satisfactory plant was singled in the third week of May. Although sprayed twice against aphids, virus yellows was prevalent late in the season. Yields ranged between 10 and 18 ton/acre, with a sugar content of 15·2%.

Potatoes. King Edward was the main variety grown, with Majestic, Pentland Dell and Arran Pilot in some experiments, and Maris Piper, an eelworm-resistant variety, on areas known to be infested. Except for crops of Arran Pilot and the Maris Piper grown for seed, all areas were planted with seed grown and chitted at Rothamsted. The early variety was planted in March and maincrops were all planted by mid-April; early growth was rapid. Most areas were sprayed with a linuron/paraquat mixture, but because the soil capped badly, all were ridged with a rotoridger. All maincrops, except the Maris Piper grown for seed, and the non-experimental King Edward, began to die back in mid-July and presented a dismal picture. The cause of the premature death, which also happened in 1966, has still to be established. Lifting started on 12 September and was finished by 9 October. All tubers were free from blight, but many, especially the white varieties, were badly affected by common scab (*Streptomyces scabies*) which caused much waste. Yields ranged widely, but the non-experimental King Edward gave a total yield of about 17 ton/acre.

Grass. Most of this was given a high nitrogen compound fertiliser in late February or early March. The hay aftermath was top-dressed with 60 units N.

Grass grew slowly in early spring but quickly in May. Much good hay was made, and one field gave an early and late crop. Extra cattle were bought in July and September to eat the ample grass.

Livestock

Cattle. Sixty beasts were wintered, half in yards and half outside. They were fed on hay, sugar-beet tops or brock potatoes, and those in the yard had a ration of home-grown concentrates. Sixteen beasts were sold fat and 44 were transferred to Rothamsted for finishing. The 25 cattle bought in the summer and autumn were brought into covered yards in November, and because of foot and mouth disease none was bought in late autumn.

The young cattle were treated in autumn with an organophosphorus insecticide against warble fly.

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Buildings

New combined hay racks and mangers, which have replaced a fence on one side of the covered yard, enable the yard to carry double the number of cattle.

The old stable was converted into a potato chitting house. The roof was lined with polythene, insulated with polystyrene, and temperature will be regulated by thermostatically controlled fan heaters.

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