ROTHAMSTED RESEARCH

Report for 1973 - Part1

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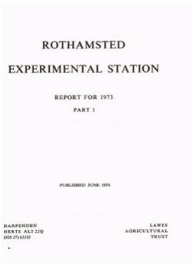

The Farms : Woburn

J. R. Moffatt

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Silage was made at the end of May; a formic/propionic acid additive was used at cutting to improve fermentation. Cutting for hay started early in June and all was made and baled, and most was carted, before a spell of heavy rain in the middle of the month.

Cattle

Each autumn young Hereford-cross cattle are bought, and all are dosed against liver fluke and with an organophosphorus insecticide against warble fly. Most are out-wintered on hay, silage and brock potatoes, and are sold fat from the grass during the summer and autumn. Those not ready are finished in covered yards during the winter using the same ration but with the addition of home-grown concentrates. In 1973, 165 cattle were sold fat from the Rothamsted and Woburn farms. In autumn 1973, 139 young cattle were bought.

Equipment

In one experiment a German-made 'Sprint' single-row bagger potato harvester was compared with hand picking. The harvester performed satisfactorily and left very few tubers in the ground provided there was no haulm. It was more satisfactory than the 'Faun' for plot work as the soil is returned to the plot from which it came. The rate of work was slow but should improve as techniques are developed.

Staff

Of the Recorder Staff, F. V. Cooper retired and A. M. Percival left. Susan Quan and K. Sykes were appointed.

WOBURN

Although the land in autumn 1972 was hard, and much had to be deep-tine cultivated instead of being ploughed, the winter wheat, sown reasonably early and after a mild, dry winter, produced some excellent crops. Spring sowings started in February 1973 and during a long dry spell most were finished earlier than usual. Excellent hay was made, though a few bales got wet before carting. Very heavy storms in May and June caused severe lodging of much wheat and barley, and severe erosion on sloping land. A dry August enabled even this lodged corn to be harvested without much difficulty, and in a warm and dry autumn, potatoes and sugar beet were lifted in good conditions, despite serious shortage of labour, and winter wheat was sown in good time. Ploughing was finished before the end of the year. Nine months in the year had less than average rainfall, the deficit for the year being 146 mm.

The effect of weather on crops

In early January the ground was dry and ploughing finished by 10 January. The weather during the whole of January and February remained generally mild and dry, and the one slight fall of snow soon melted. The land dried well, and field bean drilling was almost completed by the end of February. In March rain fell on only five days, and before the end of the month all spring cereals, sugar beet and most of the small seeds were sown; the barley land and much of the winter wheat was rolled and potato planting started. The rainfall for the first three months of the year was 50 mm (average 136 mm).

April was mainly cold, wet and windy which delayed germination and early growth. However, potato planting was finished by the end of the month, nitrogen applied to winter

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wheat and there was sufficient grass to enable the cattle to be turned out. The unsettled weather continued throughout most of May which delayed the spraying of potatoes and cereals. However, grass grew rapidly. On 21 May 52 mm of rain fell in 2 hours. This resulted in widespread erosion, particularly on potato ground, and many seed tubers were washed out; most of the ridges were flattened and had to be reformed. There was no apparent damage to cereal crops.

There was no rain between 1–19 June and by the latter date most crops were showing the need for water. However, excellent hay was made and most of it was carted before heavy rain (32·5 mm) fell on 19 June. Further heavy rain at the end of the month gave a total of 71 mm (22 mm above average) in five rain days. The early part of July was mainly dry and warm but later there were many thunderstorms which increased the lodging and caused secondary tillers to appear in all the lodged barley. A short fine spell at the end of the month was followed by more rain in early August and harvest prospects looked grim. However, in a spell of fine, hot weather which lasted until the end of the month, many of the ears of lodged crops turned upwards and cutting losses were far less than expected; harvest finished at the end of the month. Most of the wheat and all the barley had to be dried because of immature grain from secondary tillers. The fine, hot spell continued well into September but the latter half of the month was unsettled and cool.

In October and early November rain was less than average, and this greatly facilitated the lifting of potatoes and sugar beet. All was completed before the end of November, winter wheat drilling finished early in November and ploughing by the end of the year.

Cropping

Of the 75·4 ha farmed 15·7 carried wheat, 9·0 barley, 8·9 potatoes and 9·4 beans. There were small areas of sugar beet, navy beans and maize. Temporary grasses occupied 15·1 ha and permanent pasture 7·1 ha; there were 9·4 ha fallow, 3·2 ha of which were first rented in September 1972.

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 for cereals are potatoes, beans, ley or fallow.

During autumn, magnesian limestone was applied on the stubble of light land and ground carbonate on the heavy land. Several areas were sprayed with aminotriazole to control couch grass, and paraquat was used to control weeds and volunteer corn until ploughed. Many of the stubbles were too hard to plough and were worked by a deep-tined cultivator; areas after potatoes for winter wheat were treated similarly. One field was tile drained and several areas were subsoiled.

The few wild oats in all but one of the cereal crops were hand pulled. The area not done contained too many for hand roguing, and is now in rotation grass. Horsetails (*Equisetum*) were less prevalent than in 1972.

Field experiments and crops

There were 1929 field plots, 138 more than in 1972, the main increase being in cereal plots. In the dry autumn of 1972 and the favourable spring, all were sown in good time, and in the dry harvest period most were harvested successfully despite much lodging. The Market Garden experiment was damaged by birds and was not harvested as plots, but on other areas damage was less than usual. Rabbits are increasing rapidly in number and all vulnerable crops have to be fenced.

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Wheat. Maris Huntsman (6·2 ha) was grown but Cappelle (8·5 ha) remained the standard variety on experiments; all the seed sown after potatoes was dusted with mercury/dieldrin. The crops grew well in the mild winter and the nitrogenous top dressings were applied earlier than usual. Much of the Cappelle lodged badly but the Maris Huntsman, though leaning, did not lodge. In the variety experiment the mean yield was 6·37 t/ha (4·11 t in 1972). Maris Huntsman (7·46 t) gave the best yield and both Maris Templar and Maris Nimrod gave over 7 t/ha. Cappelle (5·40 t), though little lodged, gave the poorest yield of eight varieties grown. The overall effect of chlormequat chloride (CCC) was negligible and although it lessened the yield of the three high yielding Maris varieties, it increased Cappelle by 0·41 t/ha. There was little or no brown rust (*Puccinia hordei*) or yellow rust (*Puccinia striiformis*) but leaf spot (*Septoria nodorum*) was present on some varieties.

Barley. Julia was the only variety grown except on the variety trial; dusting the Rothamsted-grown seed with 'Milstem' (ethirimol) effectively controlled mildew (*Erysiphe graminis*). Sown early, it made rapid growth in May, but in June heavy rain caused early lodging, the severity of which was increased by further storms in July. The variation in lodging resulted in variable yields. The mean yield of the variety experiment was 5·11 t/ha (4·97 t in 1972); Universe gave the best average yield, though with only 38 kg/ha of nitrogen it gave the poorest yield. Julia sprayed with 'Calixin' (tridemorph) gave a mean yield of 5·44 t/ha; ethirimol dusted seed gave 0·28 t/ha less and untreated plots 0·92 t/ha less.

Beans. This crop was drilled in late February and looked well during the summer, even those on light land; they were sprayed with simazine to control weeds and phorate granules were used to control aphids, but there was a mild attack later. The storms in July caused many of the plants to 'knee' over about 15 in. from the ground. They ripened rapidly in August and though they were cut at a rather earlier stage than usual, cutter bar losses were big. Yields varied but averaged only about 2·5 t/ha.

Potatoes. Pentland Crown, because of its resistance to common scab (*Streptomyces scabies*) was the main variety, but some Maris Piper was grown because of its resistance to potato cyst nematode (*Heterodera rostochiensis*). The Pentland Crown seed was grown at Rothamsted but the Maris Piper was Foundation Stock. Chitting and early planting gave the crop a good start and, except on experiments on the control of potato cyst nematode, they grew well. Weeds were controlled by a linuron/paraquat spray. Most areas were sprayed three times against blight with an aphicide in the first spray. In August the haulm on the light-land crops and the areas affected by potato cyst nematode died rapidly and no acid spraying was needed. On other areas the haulm remained green until destroyed by acid at the end of September. Lifting started on 10 September but work was hampered by the lack of pickers; all experiments were lifted by mid-October but it took another three weeks to harvest the discards and non-experimental areas. Where the haulm died early, yields were poor and the tubers small, and on most other areas yields were less than normal; this applied particularly to Maris Piper grown on light land. There was less common scab (*Streptomyces scabies*) than usual and very little tuber blight.

In an experiment which over a period of years has compared the same varieties, Majestic yielded 32·1 t/ha (55·2 t in 1972), Pentland Crown 33·5 t (55·3 t), Maris Piper 33·6 t (46·5 t) and Record 31·9 t (40·9 t). In an experiment including newer varieties, both Pentland Crown (43·5 t) and Maris Piper (41·9 t) outyielded Pentland Ivory (32·6 t),

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Stormont Enterprise (33·4 t) and Ulster Lancer (36·6 t). In the Organic Manuring experiment where the haulm remained green until destroyed on 24 September, the mean yield was 49·9 t/ha with a best treatment yield of 60·0 t from a clover ley ploughed in.

Sugar beet. Variety Klein E was grown on the few experiments. Sown in mid-March and sprayed with 'Solubor' (66·2% diboron trioxide) it grew reasonably well. Despite spraying with 'Metasystox' some sugar-beet yellows developed late in the season. The crop was lifted in November and yields were rather small, varying from 29·8 t/ha to 40·4 t/ha; the sugar content varied between 17·1 and 18·4%.

Grassland. A high-nitrogen compound was applied to all grassland in early March. Spring growth was retarded by cold weather in April, but in May grass grew well. Cutting for hay started early in June and all was baled and most was carted before the heavy rain in mid-June. A few of the bales on the top of some field heaps had to be burnt, but the remainder was of excellent quality. All fields cut for hay were given an NK mixture and grazing land 'Nitro-Chalk 25'. Grass grew ahead of the cattle, and from two fields a second hay cut was taken in early August; grass was plentiful until the end of October. Parts of several fields were sprayed with 'Spontox' (2,4,5-T with 2,4-D) to control nettles (*Urtica dioica*). Small areas were sprayed with asulam to control docks (*Rumex* spp.).

Cattle

The policy with cattle is similar to that at Rothamsted. Young beasts are purchased each autumn, are treated against liver fluke and warbles, and overwintered in yards on hay and brock potatoes. They are fattened on the grass the following summer.

Equipment

In order to lessen the number of passes by tractors over the ground when preparing seedbeds, a rotary harrow was purchased and this worked satisfactorily.

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