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The Farms : Woburn

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retained for the breeding flock. Several of the old ewes which would normally have been culled were also retained in the flock for another year, and a few of the best ewes from Woburn were transferred to Rothamsted. The rams used for the production of fat lambs were Oxfords and Suffolks.

The use of purchased feeding stuffs for livestock was almost eliminated, the only exceptions being the sugar beet pulp allotted to us as growers and certain feeding stuffs required for the animals on experiments. The protein-rich food in the home-produced rations consisted almost entirely of beans.

During the period between the end of harvest and potato lifting general estate maintenance work, including hedge trimming and the removal of barbed wire from around the Manor House, was undertaken. This work was continued after beet-lifting had finished, and all hedges were finished, but a lot of work remains to be done before the grounds of Rothamsted House attain their pre-war condition.

Work was commenced on the much needed new road between the farm and laboratories, and six new cottages for farm workers are in course of erection. No additions to the farm buildings were made, although new office accommodation was provided by the conversion of buildings previously used for other purposes.

The farm was worked, as in the past few years, by 4 wheeled tractors and 2 teams of horses, the latter used mainly on the experimental plots and for carting. Little new equipment was purchased, other than the sack elevator and a small rotary hoe for keeping clean the paths in the experiments.

The year under review was an extremely difficult one from the farming point of view. A wet autumn followed by the severest winter in memory caused all operations to be rushed in a vain attempt to make up for the late start. It was disappointing that the results of the tremendous efforts made in the spring were not fully realised because of the severe drought which lasted throughout the summer and autumn. This greatly restricted the growth of all crops and resulted in yields which were generally well below our average. The dry conditions also hampered the preparation of the ground for the 1948 crops, but it is hoped that more normal weather will prevail in 1948 so that crop yields will be a truer reflection of the work involved.

Woburn

On 1st October, 1946, the management of the Woburn Experimental Farm was merged with that of the Rothamsted Farm, and this report covers the first year's work.

Prior to 1947 considerable emphasis had been laid on market garden crops which, with sugar beet and some potatoes and barley, formed the main arable crops. There was also a considerable area of poor quality grassland but the only stock kept was a very small pig herd and a small sheep flock kept primarily for experimental work on Swayback disease in lambs. The market garden crops demanded more labour than seemed justified on an experimental farm, and the time taken in the marketing of the small amount of produce seemed out of proportion to the returns. It was therefore decided to abandon the growing of non-experimental market garden crops.

The main objectives in the first year were:—

1. To retain the existing experimental field programme and to prepare other potential sites for field experiments.
2. To clean the arable land of twitch and other arable land weeds by increasing the area under cleaning crops such as potatoes, or, where necessary, by fallowing.
3. To increase the productivity of the arable land by better and more timely operations, by the increased use of fertilisers, especially nitrogenous fertilisers, and by the employment of seasonal labour when required.
4. To reduce the area of grassland by ploughing up the least productive grass, and to increase the productivity of the remaining grassland by increased stocking and proper management, and the judicious use of fertilisers.
5. To provide such new implements and machinery as were required to replace worn out equipment.

However, the year proved a very difficult and disappointing one, due very largely to the wide extremes of weather which prevailed. This factor severely hampered the execution of the work planned, and throughout the whole year each farming operation was, as never before, a race against time and many of the results have been disappointing.

Of the $128\frac{3}{4}$ acres farmed in 1947, 42 acres were under cereal crops, $13\frac{1}{2}$ acres under potatoes, and $6\frac{1}{2}$ acres under sugar beet. Grassland occupied 45 acres, 16 acres were bare fallowed and $5\frac{3}{4}$ acres were under sundry experimental crops. The number of experimental field plots was restricted to 330, though as on some areas two crops were taken the total number of plots harvested was 450. A more detailed report on the individual experiments will be found in the report of the Woburn Station.

The season started off well with a fine and dry October, which enabled the small potato crop to be gathered under excellent conditions and the autumn ploughing to make good progress. Unfortunately the weather then broke and in the months of November and December the rainfall totalled almost 7 in. compared with the average of 4.6 in. The harvesting of the sugar beet crop was seriously delayed and was not finished until early in January, 1947, and only a small proportion of the area scheduled for winter corn could be sown.

There followed a spell of unprecedentedly hard weather with almost continuous hard frosts and heavy falls of snow. On two nights in February the minimum temperature fell to minus 4° F and minus 5° F., and the mean for the month was 22.3° F. compared with a normal mean of 33.0° F. The snow did not melt until the end of March, and gave a rainfall figure of 4.72 in. for the month compared with the average of 1.76 in. No land work at all was possible from early January until the end of March, and this put the spring programme of work very seriously behind schedule. Many of the plans for thorough cleaning operations before spring sowings had to be abandoned, and all field operations had to be hurried through to make up for lost time. The small areas of winter wheat, rye and barley survived without damage.

Fortunately the months of April and May were generally favourable to land work, but though operations were pushed ahead

as rapidly as possible all crops were sown late. In April 8½ acres of grassland were ploughed up and sown to barley almost immediately. Potatoes were the last crop to be planted and this operation coincided with a spell of very hot weather which dried out the ground very rapidly.

The rainfall in May was only about half the normal, and this proved to be the start of a severe drought which persisted for almost 7 months. In each of the 7 months May to November, 1947, the rainfall was below normal, while the total for the period was only 6.23 in. compared with the average of 15.42 in. This lack of rain combined with temperatures well above the normal severely restricted the growth of crops. Corn crops were least severely affected and most of them looked satisfactory; the only exception was an area of Bersee wheat sown late in spring, which, despite very heavy top dressings of nitrogen made only very slow growth. Growth of sugar beet and potatoes were obviously retarded; the sugar beet wilted considerably during the long hot days; the potatoes, especially the late planted ones, were slow in coming through and then only grew slowly; grass made very little growth and by the end of July was completely burnt up, the grassland appearing not unlike stubble fields. The one hay field gave only a very low yield despite a top dressing of 3 cwt. of sulphate of ammonia, and all the undersown seeds were burnt up just after harvest. The effect of the drought on the individual experimental areas is described in the report of the Woburn Station.

The weather was ideal for operations on the fallow ground for the eradication of twitch. Three areas in Stackyard field were fallowed; the permanent wheat plots to eradicate creeping soft grass (*Holcus mollis*), the permanent barley plots to eradicate creeping soft grass and Fiorin (*Agrostis stolonifera*), and series C, not at present under experiment, to eradicate Fiorin. Wild Oats (*Avena* spp.) were also prevalent in the permanent barley plots, with some on the wheat plots, but it is unlikely that the fallowing did much to reduce the number of seeds of this weed as the ground was too dry for germination.

Conditions for harvesting were ideal and all crops were carted with a minimum of labour, many of them without having been shocked. The Rothamsted harvesting technique was used for the first time on the experimental plots, and threshing was done soon after harvest with a small portable machine from Rothamsted. The overall average yield of barley was just over 18 cwt. per acre, and of wheat (including the disappointing area of spring wheat) just over 14 cwt. per acre.

Potato lifting was delayed until towards the end of October as the tops remained green and the tubers appeared to be still growing. The tops were burnt off with sulphuric acid to facilitate the lifting, while the picking was done by German P.O.W. labour. The crop was cleared under excellent conditions, and the estimated yield of 6 tons per acre, though low, must be considered reasonable for the season. The crop was stored under cover so that sorting would provide a wet weather job during the winter months.

Sugar beet lifting followed and was done by the regular staff. The roots were very small but the sugar content, especially of the

beet lifted first, was high. Yields were approximately 6 tons per acre of clean beet with an average sugar content of 18.9 per cent.

The early completion of harvest should have provided the opportunity for thorough cleaning operations in the autumn, but the ground proved to be much too hard for this work. The ploughing of stubbles had to be abandoned for the same reason, and though the ground gradually became softer some of the fields could not be ploughed satisfactorily until late November. On some of the land which might have been ploughed earlier the work was held up by the scarcity of plough-shares. The difficulty in preparing the land prevented the sowing of autumn wheat on most of the area scheduled for this crop.

LIVESTOCK

Twenty-one Irish crossbred cattle were purchased in the autumn of 1946 to graze down the understocked grass and to make farmyard manure in covered yards during the winter. It was hoped that the beasts would fatten on the grass during 1947. However, the grass made such little growth that there was no hope of fattening these beasts and ten of them were transferred to Rothamsted in June. The remaining eleven had insufficient grass on which to fatten, so they have had to be yarded again as stores for the winter of 1947-48 as there is insufficient hay and feeding stuffs on which to fatten them in the yards.

The ewe flock, which consisted mainly of very old ewes of very mixed breeds and crosses, suffered severe casualties during the year; 20 of them died, mainly through old age. Those that survived produced a small crop of weakly lambs which have not done at all well. There were only about 6 ewes worth retaining, and these were transferred to the Rothamsted flock. The remainder of the old ewes were transferred to Rothamsted for fattening off on kale, and after the 1947 lamb crop has been disposed of the land at Woburn will be rested from sheep for one or two years.

The pig herd, which had been maintained at 5 breeding sows during the war years, has been increased rapidly by retaining some of the best of the home bred gilts and by the purchase of small gilts from other herds. Most of the young pigs reared have been sold locally for fattening, many of them to members of a local pig club.

IMPLEMENTS

During the year considerable progress has been made in re-equipping the farm with modern implements to replace old and unreliable ones.

SUMMARY

The year 1946-47 has been a very difficult one, with many disappointments and much frustration, due almost entirely to wide extremes of weather conditions. The time lost in the late autumn, winter and early spring was never regained, while the severe drought considerably reduced growth of all crops and so affected yields considerably. Although it was not possible to execute much of the work which was planned, considerable improvements have been made during the year, and plans are prepared for a considerable expansion of output in 1948.