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Report for 1948

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Rothamsted Experimental Station
Harpenden

LAWES AGRICULTURAL TRUST

REPORT
for
1948

Woburn Field Experiment

Rothamsted Research

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acre, a very satisfactory crop. As usual a high seed rate, 3 cwt. per acre, was distinctly more satisfactory than a lower rate, 2 cwt. per acre. The extra cwt. of seed gave a further 3½ cwt. grain. The yield of straw was nearly 2 tons per acre for the crop grew very tall.

Fertilizer placement experiments

Two of these were carried out on Long Hoos using the special drill made by the National Institute of Agricultural Engineering, one on sugar beet and the other on peas for threshing. These experiments are part of a series carried out for the most part at outside centres; they are reported by the Chemistry Department.

Woburn Field Experiments, 1948

Classical Experiments

The permanent wheat and barley land was once again fallowed in 1948 making two years' fallow since the last crops were taken.

Long Period Rotation Experiments

Six-course rotation, 19th year

This experiment is on exactly the same lines as the one at Rothamsted except that in recent years the variety of wheat grown has been Square Heads Master instead of Yeoman. Crops were on the whole satisfactory in 1948. Sugar beet gave an average yield of 9·5 tons which is very close to the mean of all years. Potatoes at 8·9 tons were slightly better than usual. Barley produced the excellent crop of 27·5 cwt. per acre, whereas wheat yielded 20·8 cwt. and rye 21·0 cwt. All crops except the clover which this year was trifolium owing to a failure of the main sowing, responded well to nitrogen, but phosphate and potash were ineffective.

The first sowing of wheat failed through bird damage and the crop was resown on November 14th, a fair crop resulted but there was much shrivelled grain. Rye sown on November 15th did not suffer from bird damage. The results of this experiment over the 19-year period 1930-48 are summarized on p. 90.

New green manuring experiment, 11th year

This experiment compares undersown clover, undersown ryegrass, lupins and rape as green manures for autumn cabbages followed by barley. In 1948 a fair crop of barley, 22·4 cwt., was grown which showed a striking response of 8 cwt. of grain for 2 cwt. of sulphate of ammonia. Of the green manures turned in for the previous cabbages, clover was the best and ryegrass the worst in its effects on the barley.

Ley arable rotation, 11th year

This experiment tests the value of three years' ley and three years' lucerne as a means of building up soil fertility in comparison with rotations without leys (for full description see Rothamsted report, 1938, p. 135). Block 3 now begins its third rotation. Potatoes showed a pronounced residual effect of 2·23 tons due to 15 tons of dung applied two years previously. The level of cropping was excellent, mean yield 16 tons. The ley plots were sown at the end of March and gave no less than 7 grazings. The grass cuttings from these plots expressed as hay yielded 4·3 tons per acre. This

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was by far the most productive first year grazing season on record. Lucerne sown on May 18th showed some loss of plant during the season especially on plots which had frequently grown lucerne in past years. Block 5 shows the second years' test crop, barley, which at 30·6 cwt. was the best crop so far grown in this experiment. It showed small but appreciable residues of dung applied to the previous potato crop, but very little effect due to the previous systems of cropping. Blocks 1 and 2 showed leys in their 2nd and 3rd years and various arable crops. In 1948 the 2nd year of the ley at 4·4 tons of hay equivalent was more productive than the third year at 3·4 tons. Third year lucerne gave 3·2 tons of hay during the season, and 2nd year lucerne 4·3 tons. Wheat failed twice from autumn sowings due to birds and was resown in the spring. The final yield was only 14 cwt. 1 year seeds for hay undersown in wheat in 1947 failed in the summer drought and were resown on the bare ground in the spring of 1948. Only a poor crop of 1·2 tons per acre resulted. Sugar beet was a satisfactory crop of 10·8 tons with a rather high proportion of tops. This experiment is summarized on p. 94.

Organic manure experiment, market garden crops, 7th year

This experiment tests the effect of yearly applications of dung, vegetable compost, sewage sludge, and sewage sludge compost on a rotation of vegetable crops. The organics are applied at 15 and 30 tons per acre to peas and to red beet. Sulphate of ammonia at several levels is also tested. The peas drilled on March 16th turned out a very weedy crop and there was a rather large proportion of unfilled pods. Better germination was noticed on the plots receiving organic manures, but the crop was very variable. Dung increased the yield of saleable peas and sludge decreased it. There was no advantage from the addition of sulphate of ammonia. Red beet was a gappy plant partly owing to an attack of flea beetle; there were more plants where organics were applied. There were many bolters and the number of these was increased by those treatments which increased the crop yield. The yield of bulbs was very small on the control plots but was considerably increased by organics, especially dung and sewage sludge. Sulphate of ammonia was also effective.

Annual Experiments

The only annual experiments at Woburn in 1948 were replications of the two linseed experiments as carried out at Rothamsted.

Six Course Rotation Experiments, 1930-1948

In 1930 two long-period rotation experiments were started, one at Rothamsted and the other at Woburn. The purpose was to provide data on the effects of varying amounts of the three standard nutrients, nitrogen, phosphate and potash on the yield of the six crops of the rotation in the different weather conditions of successive years.

The rotation is sugar beet, barley, clover, wheat, potatoes, rye. For the first 4 years the rye was harvested as green fodder, but subsequently it has been carried on to maturity and weighed as

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