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RESEARCH

## Report for 1937

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## Malting Barley

### Rothamsted Research

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growing between fields, notably between Great Knott and Fosters and between Hoos and Fosters and on *Alopecurus agrestis* growing as a weed among sugar beet, mangolds and kale on Long Hoos and Fosters fields. It was found in late summer and autumn plentifully on *Dactylis glomerata*, *Holcus lanatus* and *Alopecurus agrestis*, fairly commonly on *Lolium perenne* and *Agropyrum repens* and occasionally on *Arrhenatherum avenaceum*. Ergot was similarly plentiful on wild grasses in 1932 but had not been observed in the intervening years.

Choke (*Epichloe typhina* (Fr.) Tul.) occurred on *Agrostis* on the grass plots, as usual being most plentiful on the more acid plots where also *Agrostis* was most frequent.

#### CLOVER

*Peronospora Trifoliorum* de Bary was rather common on the six course rotation, Long Hoos in the autumn.

Rot (*Sclerotinia Trifoliorum* Erikss.) caused bad patches on the six course rotation experiment, Long Hoos, in the spring and previous autumn. By May the clover was, in general, growing well and the bare patches left by the disease were filled by chickweed.

#### BROAD BEAN

Chocolate Spot (*Botrytis* spp.) causing two types of lesion, and Rust (*Uromyces Fabae* (Pers.) de Bary) was slight early in the season and moderate by August on Great Knott field.

#### POTATO

Virus. Leaf Drop Streak (first year symptoms of infection with virus Y) was fairly common at Rothamsted and Woburn on variety Ally.

Leaf Roll was rather common in July on Majestic from Scotch seed at Woburn.

Stem Canker (*Corticium Solani* Bourd and Galz.) was occasionally found on Majestic at Woburn.

#### MANGOLD

Virus. A little Mosaic disease was found in the autumn at Rothamsted.

#### SUGAR BEET

Virus. There was a little Mosaic in the autumn at Rothamsted.

#### LUPIN

*Fusarium culmorum* attacked about 5 per cent. of the lupin plants on Lansome field, Woburn.

#### MALTING BARLEY

The fourth Conference on the growing of malting barley was held on November 24th, 1937 on the same lines that proved so successful in the three previous years. Samples were sent in by growers from all the important barley growing districts, accompanied by full agricultural details. These samples were graded by an expert committee of valuers, and were then displayed at the Conference to provide the basis of a discussion of the technical problems of barley growing. The grading distinguished six classes, grades I to III representing pale ale barleys, and grades IV to VI mild ale barleys. The price range between grades was about three shillings per quarter.



This year the value of the lowest grade was three-quarters of the highest, instead of one half as in 1936 or less than one half in 1935.

Yields were low, but the cash returns per acre were probably better than for many years.

The sowing conditions were very poor and continued until late spring; but good growing conditions followed, and harvest weather was good.

The samples reaching the malting standard were 231, divided as follows:

District	Grade						Total	Mean
	I	II	III	IV	V	VI		
Norfolk .. ..	—	3	6	12	10	4	35	4.17
Suffolk .. ..	4	12	7	7	4	—	34	2.85
Essex .. ..	3	4	7	5	1	1	21	3.00
Kent .. ..	2	7	4	1	—	—	14	2.29
Yorks and Lincs .. ..	—	—	5	9	9	3	26	4.38
E. Midlands .. ..	2	4	6	2	4	1	19	3.26
South .. ..	1	3	14	17	11	2	48	3.83
West .. ..	1	3	4	18	7	1	34	3.88
<b>Total</b>	<b>13</b>	<b>36</b>	<b>53</b>	<b>71</b>	<b>46</b>	<b>12</b>	<b>231</b>	<b>3.59</b>

So far as the samples sent in were representative of their districts, there is a marked effect of locality in the grading results. The Kent barleys were far above the average in quality, those from Suffolk and Essex were distinctly better than average, those from East Midlands slightly better and those from South and West slightly below the average, while those from Norfolk, Yorkshire and Lincolnshire were below it.

The distribution of the grades showed many more samples in the higher grades than in 1936.

1937 Grade	I	II	III	IV	V	VI
Percentage .. ..	5.6	15.6	22.9	30.7	19.9	5.2
1936 Grade	A	B	C	D	E	F
Percentage .. ..	2.5	2.9	7.6	19.9	46.6	20.6

The estimates of yield for the various districts were:

Average Yield, bushels per acre		
By Districts	By Grades (All Districts)	
	Spring Sown	Autumn Sown
Norfolk .. ..	35	33
Suffolk .. ..	I, II, III, .. 36	33
Essex .. ..	IV .. 34	28 (2 samples)
Kent .. ..	V .. 34	36 (1 sample)
Yorks and Lincs .. ..	VI .. 32	—
E. Midlands .. ..	Mean 1937 .. 34	33
West .. ..	„ 1936 .. 41	39
South .. ..	32	—
<b>1937 Mean .. ..</b>	<b>34</b>	
1937 Min. of Agric. ..	28	
1936 Mean .. ..	41	
1936 Min. of Agric. ..	34	



The mean yields of the samples were considerably higher than the Ministry of Agriculture estimates. This was not due to optimistic estimates by the senders of the samples, since this year there were 24 measured (threshed) yields which gave an average of 36 bushels per acre, or 2 bushels higher than the average of the estimated yields.

Kent, which produced the best samples also gave the highest mean yield, the West gave nearly as high a yield, while the remainder were very close to the average.

The autumn sown barleys yielded rather less than the spring sown. The best comparison was in grades I to III, where the autumn sown barleys yielded 3 bushels per acre less than the spring sown.

On the other hand, the autumn sown samples were of excellent quality as the following figures show :

Grade	<i>Spring Sown</i>		<i>Autumn Sown</i>	
	Number	Per cent.	Number	Per cent.
I, II, III	70	37.0	28	90.3
IV	66	34.9	2	6.5
V	43	22.8	1	3.2
VI	10	5.3	—	—
Total	189	100.0	31	100.0

Practically all the autumn sown samples fell into grades I to III and less than 10 per cent. into grades IV to VI, while of the spring sown samples only 37 per cent. fell into grades I to III and 63 per cent. into grades IV to VI.

The distribution of varieties by districts was similar to that observed in previous years.

So far as the sequence of cropping was concerned there did not appear to be any appreciable difference in the quality of the barleys following corn as compared with those following sugar beet or mangolds. However, the yield of barley following beet or mangolds averaged 3 bushels an acre more than that of barley following grain crops.

Grade	<i>Previous Crop</i>							
	<i>Average Yield in bushels per acre</i>							
	<i>Corn</i>		<i>Beet or Mangolds</i>		<i>Kale or Turnips</i>		<i>Seeds</i>	
	No.	Av. yield	No.	Av. yield	No.	Av. yield	No.	Av. yield
I, II, III	.. 46	34	29	36	6	37	5	33
IV	.. 30	31	19	34	11	37	5	37
V	.. 21	33	9	37	4	27	3	31
VI	.. 3	30	2	41	3	31	1	24
Total	100	33	59	36	24	34	14	33



The main effect of time of sowing is shown between autumn and spring sowings. An examination of the spring sowing dates shows that very few of the earlier spring sowings fell into the lower grades. However, any effect of time of sowing is rather masked by the general late sowing in 1937, as shown by the comparison of the sowing dates of 1936 and 1937.

Grade	<i>Time of Spring Sowing</i>				
	Feb.	March 1st-14th	March 15th-28th	March 29th- April 11th	After April 11th
I, II, III .. ..	3	6	16	34	9
IV .. ..	2	8	9	24	23
V .. ..	1	—	5	14	23
VI .. ..	—	—	—	5	5
Total 1937 ..	6	14	30	77	60
Per cent. 1937 ..	3.2	7.5	16.0	41.2	32.0
Per cent. 1936 ..	4.9	24.6	45.9	18.9	5.7

The use of manures followed the lines reported in previous years.

Grade	<i>Manuring</i>			
	No Manure	Artificial only	Organic Manures	Organic + Artificial
I, II, III .. ..	7	57	19	15
IV .. ..	8	33	17	11
V .. ..	3	22	10	9
VI .. ..	—	3	5	2
Total .. ..	18	115	51	37
Per cent. 1937 ..	8	52	23	17
Per cent. 1936 ..	14	44	30	12

Of the 152 samples for which artificials were used, just one third of them used the newer high analysis compound fertilisers.

There seems to be little indication from these figures that the use of no manure resulted in better quality. When artificials were used some form of nitrogen was practically always included, even when artificials were applied after sheepling or ploughing in tops. The average dressing of nitrogen in artificial form was just under 20 lb. N per acre or slightly less than the equivalent of 1 cwt. sulphate of ammonia.

In 1937, out of over 200 samples, only 23 cases of very slightly lodged samples were reported, as compared with 21 per cent. seriously lodged in 1936.

#### CHANGES IN STAFF

The Station has unfortunately lost a number of valuable members of staff during the year (see page 10) and serious consideration should be given to the avoidance of too great a rate of change. A certain movement through the Institution is desirable but when changes occur too frequently a serious loss of time and money becomes inevitable.