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### Malting Barley

#### Rothamsted Research

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### MALTING BARLEY

A third conference on the growing of malting barley was held on December 2nd, 1936 on the lines of those that proved so successful in the two 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 denoted by the letters A to F. Those in grade A were quite exceptional barleys of the very finest quality and all grades from A to D would be used by some brewers for their pale ales. Grades E and F comprised barleys that met a good demand for mild ales and stouts. All these grades represented therefore malting barleys, the price range between grades being about five shillings per quarter.

The samples reaching the malting standard were 277, divided as follows :—

District	A	B	C	D	E	F	Total
Norfolk .. .. .	1	—	—	11	52	19	83
Suffolk .. .. .	—	—	3	11	22	3	39
Essex .. .. .	—	2	10	9	7	3	31
Kent .. .. .	5	5	3	3	1	—	17
Lincolnshire .. .. .	—	—	—	9	14	9	32
Yorkshire .. .. .	—	—	—	—	1	3	4
East Midland .. .. .	—	—	2	3	13	3	21
South .. .. .	—	—	3	5	5	9	22
West .. .. .	1	1	—	4	14	8	28
	7	8	21	55	129	57	277

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 Essex were distinctly better than average, while the Yorkshire, Norfolk, and Lincolnshire barleys were below it. The distribution of grades shows also how exceptional the really high class samples are, thus grades A and B together account for only little more than 5 per cent. of the total. Almost half of the samples fell into class E, and there were more in class F than in class D.

In addition to the details of cultivation and manuring recorded in the previous conferences, an estimate of yield was obtained for each of the fields sampled. The figures for the various districts were :

By Districts	Average yield, bushels per acre	
	By Grades (All districts)	
Norfolk .. 41	Spring	Autumn
Suffolk .. 42	Sown	Sown
Essex .. 40	A, B, C 46	37
Kent .. 47	D 41	40
Lincolnshire .. 37	E 42	41
Yorkshire .. 32	F 37	39
E. Midlands .. 44	Mean 41	39
West .. 42		
South .. 36		

Kent which produced the best samples also give the highest mean yield, while Yorkshire and Lincolnshire which were below the aver-

age in quality were also below the average in yield. The autumn sown barleys yielded on the average rather less than spring sown barleys. If this comparison is made within the county of Essex in which about two thirds of the autumn sown barleys were grown the advantage of the spring sown barleys is even more pronounced, the figures being spring sown, 45 bushels per acre, autumn sown, 38 bushels per acre. On the other hand the autumn sown samples were of excellent quality as the following figures show :—

Grade	Spring Sown		Autumn Sown	
	Actual	Per cent.	Actual	Per cent.
A, B, C	23	9.5	14	45.2
D	44	18.2	10	32.2
E	124	51.0	4	12.9
F	52	21.3	3	9.7
Total	243	100.0	31	100.0

Almost half the autumn sown samples were found in the first three groups, whereas only 10 per cent. of the spring sown samples were so placed.

The distribution of varieties by districts was similar to that observed in previous years. Spratt Archer and the rather similar variety New Cross accounted for almost all the Norfolk and Suffolk samples and were also much in evidence in Lincolnshire. Elsewhere Spratt Archer and Plumage Archer were much more equal in favour ; and in Kent every sample received was Plumage Archer. Plumage Archer also predominated in the autumn sown barleys.

The soil type as judged by the farmer's description of his land was not closely connected with barley quality in 1936 as the following classification shows :

Grades	Soil Type			Not	
	Light	Medium	Heavy	Calcareous	Calcareous
A, B, C	16	12	7	14	21
D	27	23	4	21	33
E	46	62	18	34	92
F	25	26	6	21	36
Total	114	123	35	90	182
Per cent.	42	45	13	33	67

Distribution of light, heavy and medium soils was much the same in the group of best barleys as in the lowest graded group. Heavy soils were rather unusual, accounting for only 13 per cent. of the total, but one third of all soils were of chalky character.

So far as the sequence of cropping was concerned a considerable proportion of the high class barleys followed corn rather than roots. Although several fine samples followed sugar beet and mangolds, most of the barleys after roots, representing the common sequence in the four course rotation, were only of moderate quality in 1936.

Grade	Previous Crop			
	Corn	Beet or Mangolds	Kale or Turnips	Seeds
A, B, C	20	8	3	2
D	24	16	5	7
E	43	57	19	10
F	17	21	14	5
Total	104	102	41	24

The main effect of time of sowing is shown between autumn and spring sowings. An examination of the spring sowing dates shows that whereas little benefit was derived in this particular season from very early spring sowings, when the date was postponed till after the end of March an unduly high proportion of low grade samples resulted.

Grade	Feb.	Time of Spring Sowing			
		March 1-14	March 15-28	March 28th-April 11th	After April 11th
A, B, C	1	9	10	1	—
D	2	16	23	4	—
E	7	26	63	22	7
F	2	9	16	19	7

No barley sown after April 11th was graded higher than E, and of those sixty samples sown after March 28th there were only five that were placed higher than grade E

The use of manures followed the lines reported in previous years. By far the commonest procedure was to grow the crop either on artificials only or on organic manures only. The organic manure was occasionally dung but more usually sheeping of roots or beet tops, or beet tops ploughed in for green manure. No manuring of any kind, or a combination of organic manure and artificials was somewhat unusual.

Grade	No Manure	Manuring		
		Artificials only	Organic Manures	Organic + Artificials
A, B, C	9	18	4	3
D	6	30	11	6
E	16	50	39	15
F	6	19	25	8
Total	37	117	79	32
Per cent	14	44	30	12

There is some suggestion that the no-manure group leads in quality, one quarter of the total being in the three highest grades. Of the barleys grown after organic manures only 6 per cent. attained these grades. When artificials were used some form of nitrogen was almost always included. On 41 farms this was practised when the previous crop was dunged, and on 11 farms further nitrogen was applied after the previous crop had been folded by sheep. The average dressing of nitrogen in artificial form was 20 lb. N per acre or almost the equivalent of 1 cwt. sulphate of ammonia.

Observations were made on the degree of lodging.

Grade	Standing or nearly so	Seriously Lodged	Percentage of
			crops seriously Lodged
A, B, C	29	5	15
D	45	5	10
E	98	30	23
F	39	17	30

The last two grades and particularly the lowest grade showed a higher proportion of lodged crops than the others.