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## Yields of the Field Experiments 2000

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### 00/R/HB/2 Hoos Barley - S. Barley

#### Rothamsted Research

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00/R/HB/2

HOOS BARLEY

**Object:** To study the effects of organic and inorganic manures on continuous s. barley. From 1968 to 1978 a rotation of potatoes, beans and s. barley was practised. The rotation was discontinued in 1979 and continued in s. barley.

The 149th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and 74-99/R/HB/2.

**Treatments:** All combinations of:-

Whole plots

1. **MANURE** Plot Fertilizers and organic manures:

		Form of N 1852-1966	Additional treatments 1852-1979	Changes since 1980
---	11	None	-	-
-P-	21	None	P	-
--K	31	None	K (Na)Mg	-
-PK	41	None	PK (Na)Mg	-
A--	12	A	-	-
AP-	22	A	P	-
A-K	32	A	K (Na)Mg	-
APK	42	A	PK (Na)Mg	-
N----	131	N	-	-
NP---	231	N	P	-
N-K--	331	N	K (Na)Mg	-
NPK--	431	N	PK (Na)Mg	-
N--S-	134	N	Si	Si omitted
NP-S-	234	N	P Si	"
N-KS-	334	N	K (Na)MgSi	"
NPKS-	434	N	PK (Na)MgSi	"
N---S	132	N	-	Si added
NP--S	232	N	P	"
N-K-S	332	N	K (Na)Mg	"
NPK-S	432	N	PK (Na)Mg	"
N--SS	133	N	Si	-
NP-SS	233	N	P Si	-
N-KSS	333	N	K (Na)MgSi	-
NPKSS	433	N	PK (Na)MgSi	-
C(--)	14	C	-	PKMg omitted
C(P-)	24	C	P	"
C(-K)	34	C	K (Na)Mg	"
C(PK)	44	C	PK (Na)Mg	"
D	72	None	D	-
(D)	71	None	(D)	-
(A)	62	None	(Ashes)	-
-	61	None	-	-

Form of N: A sulphate of ammonia: N nitrate of soda - each to supply 48 kg N: C castor meal to supply 96 kg N  
 P: 35 kg P as triple superphosphate in 1974 and since 1988, single superphosphate in other years  
 K: 90 kg K as sulphate of potash  
 (Na): 16 kg Na as sulphate of soda until 1973  
 Mg: 35 kg Mg as kieserite every third year since 1974 (applied at 30 kg in 1992, 1995 and 1998) (sulphate of magnesia annually until 1973)  
 Si: Silicate of soda at 450 kg  
 D: Farmyard manure at 35 t. (D): until 1871 only  
 (Ashes): Weed ash 1852-1916, furnace ash 1917-1932, none since

00/R/HB/2

Sub-plots

2. **N** Nitrogen fertilizer (kg N), as 'Nitro-Chalk', since 1968 (cumulative N applications until 1973, on a cyclic system since 1974):

0  
48  
96  
144

Plus extra plots testing all combinations of:-

Whole plots

1 **MANURE** Fertilizers other than magnesium:

55AN2PK	Plot 55	AN2PK
56--PK	Plot 56	--PK
57NN2--	Plot 57	NN2
58NN2--	Plot 58	NN2

N2: 96 kg N as 'Nitro-Chalk' since 1968. Other symbols as above.

Sub-plots

2. **MAGNESIUM** Magnesium fertilizer (kg Mg) as kieserite every third year since 1974:

0  
35 (30 in 1992, 1995 and 1998)

**NOTE:** For a fuller record see 'Details' etc.

**Experimental diary:**

08-Dec-99 : **T** : P and K applied.  
14-Dec-99 : **T** : Si applied.  
15-Dec-99 : **T** : Farmyard manure applied.  
17-Dec-99 : **B** : Ploughed.  
06-Mar-00 : **B** : Combination drilled, Optic, tr. Raxil S, at 350 seeds/m<sup>2</sup> with the Accord drill.  
07-Mar-00 : **B** : Rolled.  
10-May-00 : **T** : N treatments applied as 27.0 % N.  
24-May-00 : **B** : Opus at 0.3 l with Unix at 0.5 kg in 100 l.  
03-Jun-00 : **B** : Ally at 30 g with Duplosan at 1.0 l in 200 l.  
20-Jun-00 : **B** : Opus at 0.3 l in 200 l.  
17-Jul-00 : **B** : Hand rogued wild oats.  
24-Aug-00 : **B** : Combine harvested.

**NOTE:** Samples of grain and straw were taken for chemical analysis. Unground grain and straw samples from selected treatments were archived.

00/R/HB/2 MAIN PLOTS

GRAIN TONNES/HECTARE

\*\*\*\*\* Tables of means \*\*\*\*\*

N	0	48	96	144	Mean
<b>MANURE</b>					
---	0.86	1.49	1.04	1.44	1.21
-P-	1.01	2.10	3.17	2.59	2.22
--K	0.55	1.83	1.46	2.46	1.58
-PK	0.70	2.84	3.67	4.46	2.92
A--	0.24	0.91	1.32	0.73	0.80
AP-	1.61	2.43	2.16	2.07	2.07
A-K	0.88	1.55	1.66	2.32	1.60
APK	1.06	3.15	4.59	4.68	3.37
N----	0.88	1.72	2.36	2.22	1.79
NP---	1.70	3.17	3.31	3.06	2.81
N-K--	1.31	1.32	1.76	2.53	1.73
NPK--	1.24	2.97	4.76	5.05	3.51
N--S-	0.99	2.04	2.05	2.54	1.91
NP-S-	1.32	2.61	3.47	3.59	2.75
N-KS-	1.31	2.28	3.56	3.88	2.76
NPKS-	1.36	3.50	5.07	4.97	3.73
N---S	1.32	1.97	2.99	3.50	2.44
NP--S	1.70	3.18	3.77	4.32	3.24
N-K-S	1.05	2.07	2.97	2.49	2.15
NPK-S	1.37	3.08	4.76	5.13	3.58
N--SS	1.27	2.36	2.54	2.67	2.21
NP-SS	1.38	3.12	4.09	4.02	3.16
N-KSS	1.17	2.84	3.09	3.58	2.67
NPKSS	1.33	3.79	4.33	5.74	3.80
C(--)	0.85	2.40	2.71	3.59	2.39
C(P-)	0.83	2.94	3.45	4.37	2.90
C(-K)	1.24	2.16	3.79	2.94	2.53
C(PK)	1.24	3.61	4.13	4.92	3.47
D	5.10	6.82	6.68	6.87	6.37
(D)	1.27	1.81	1.95	1.97	1.75
(A)	0.87	1.76	2.27	3.30	2.05
-	0.43	1.79	1.13	1.45	1.20
Mean	1.23	2.55	3.13	3.42	2.58

GRAIN MEAN DM% 86.0

00/R/HB/2 MAIN PLOTS

STRAW TONNES/HECTARE

\*\*\*\*\* Tables of means \*\*\*\*\*

N	0	48	96	144	Mean
<b>MANURE</b>					
---	0.21	0.34	0.24	0.37	0.29
-P-	0.28	0.62	1.14	0.67	0.68
--K	0.12	0.60	0.35	0.47	0.39
-PK	0.16	0.97	1.32	1.67	1.03
A--	0.10	0.31	0.17	0.13	0.18
AP-	0.52	0.86	0.75	0.50	0.65
A-K	0.20	0.39	0.43	0.52	0.39
APK	0.26	1.26	1.63	1.69	1.21
N----	0.13	0.44	0.32	0.58	0.37
NP---	0.50	1.08	1.09	0.88	0.89
N-K--	0.31	0.36	0.31	0.60	0.39
NPK--	0.18	1.26	1.88	2.08	1.35
N--S-	0.24	0.51	0.49	0.81	0.51
NP-S-	0.37	0.87	1.01	1.08	0.83
N-KS-	0.24	0.56	1.11	1.03	0.73
NPKS-	0.35	1.28	1.98	2.13	1.44
N---S	0.19	0.44	0.70	0.90	0.56
NP--S	0.44	1.19	1.27	1.00	0.97
N-K-S	0.24	0.48	0.68	0.48	0.47
NPK-S	0.29	0.91	1.85	1.83	1.22
N--SS	0.25	0.63	0.70	0.76	0.58
NP-SS	0.31	1.26	1.26	1.26	1.02
N-KSS	0.41	0.86	0.90	0.96	0.78
NPKSS	0.40	1.53	1.41	2.23	1.39
D	1.62	2.89	2.64	2.98	2.53
(D)	0.36	0.44	0.60	0.67	0.52
(A)	0.26	0.50	0.59	0.85	0.55
-	0.08	0.45	0.34	0.41	0.32
Mean	0.32	0.83	0.97	1.05	0.79

STRAW MEAN DM% 83.4

EXTRA PLOTS

GRAIN TONNES/HECTARE

\*\*\*\*\* Tables of means \*\*\*\*\*

MANURE	551AN2PK	561--PK	571NN2--	581NN2--	Mean
<b>MAGNESIUM</b>					
0	3.54	0.40	2.20	1.43	1.89
35	3.61	0.42	2.24	1.56	1.96
Mean	3.57	0.41	2.22	1.50	1.92

GRAIN MEAN DM% 83.8