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## Yields of the Field Experiments 1990

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

#### Rothamsted Research

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90/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 the experiment reverted to continuous s. barley.

The 139th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and 74-89/R/HB/2.

**Treatments:** All combinations of:-

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

	Form of N 1852-1966	Additional treatments 1852-1979	Changes since 1980
---	None	-	-
-P-	None	P	-
--K	None	K (Na) Mg	-
-PK	None	PK (Na) Mg	-
A--	A	-	-
AP-	A	P	-
A-K	A	K (Na) Mg	-
APK	A	PK (Na) Mg	-
N----	N	-	-
NP---	N	P	-
N-K--	N	K (Na) Mg	-
NPK--	N	PK (Na) Mg	-
N--S-	N	Si	Si omitted
NP-S-	N	P Si	"
N-KS-	N	K (Na) MgSi	"
NPKS-	N	PK (Na) MgSi	"
N---S	N	-	Si added
NP--S	N	P	"
N-K-S	N	K (Na) Mg	"
NPK-S	N	PK (Na) Mg	"
N--SS	N	Si	-
NP-SS	N	P Si	-
N-KSS	N	K (Na) MgSi	-
NPKSS	N	PK (Na) MgSi	-
C(--)	C	-	PKMg omitted
C(P-)	C	P	"
C(-K)	C	K (Na) Mg	"
C(PK)	C	PK (Na) Mg	"
D	None	D	-
(D)	(D)	-	-
(A)	(Ashes)	-	-
-	None	-	-

90/R/HB/2

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 single superphosphate (triple superphosphate in 1974, 1988 and 1989)

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 (sulphate of magnesia annually until 1973)

Si: Silicate of soda at 450 kg

D: Farmyard manure at 35 tonnes. (D): until 1871 only

(Ashes): Weed ash 1852-1916, furnace ash 1917-1932, none since

2. **N** Nitrogen fertilizer (kg N), as 'Nitro-Chalk' (27% N in 1990), since 1968 (cumulative N applications until 1973, on a cyclic system since 1974):

0  
48  
96  
144

Plus extra plots testing all combinations of:-

1. **MANURE** Fertilizers other than magnesium:

551AN2PK	Plot 551 AN2PK
561--PK	Plot 561 --PK
571NN2--	Plot 571 NN2
581NN2--	Plot 581 NN2

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

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

0  
35

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

**Basal applications:** Weedkillers: Glyphosate at 1.4 kg in 200 l. Mecoprop at 1.6 kg, bromoxynil at 0.20 kg and ioxynil at 0.20 kg applied with the fungicide in 200 l. Fungicide: Fenpropimorph at 0.75 kg. Insecticide: Demeton-s-methyl at 0.24 kg in 200 l.

**Seed:** Triumph, seed dressed triadimenol and fuberidazole, sown at 160 kg.

**Cultivations, etc.:-** Glyphosate applied: 2 Oct, 1989. P and silicate of soda applied: 29 Nov. K applied: 30 Nov. FYM applied: 4 Dec. Ploughed: 6 Dec. Spring-tine cultivated three times, seed sown: 5 Mar, 1990. N applied: 10 Apr. Insecticide applied: 10 May. Remaining weedkillers applied with the fungicide: 14 May. Combine harvested: 6 Aug.

90/R/HB/2

MAIN PLOTS

GRAIN TONNES/HECTARE

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

N	0	48	96	144	Mean
<b>MANURE</b>					
---	0.84	0.88	1.49	1.35	1.14
-P-	1.87	2.19	2.08	1.82	1.99
--K	1.70	2.38	2.40	2.26	2.19
-PK	1.89	3.50	3.58	3.84	3.20
A--	1.38	1.04	1.53	1.38	1.33
AP-	1.80	1.88	1.97	1.88	1.88
A-K	1.60	2.07	2.06	2.07	1.95
APK	2.52	3.68	4.48	4.39	3.77
N----	1.52	1.74	0.93	1.46	1.41
NP----	1.82	2.65	2.96	2.56	2.50
N-K--	1.94	2.24	2.20	2.04	2.11
NPK--	2.61	3.97	4.24	4.43	3.81
N--S-	1.59	2.13	2.47	1.71	1.98
NP-S-	2.30	3.05	2.48	2.56	2.60
N-KS-	2.38	2.75	3.16	2.99	2.82
NPKS-	2.08	3.89	4.31	4.36	3.66
N---S	1.86	1.99	1.85	1.92	1.91
NP--S	1.90	2.81	3.08	2.84	2.66
N-K-S	2.13	2.52	2.89	2.97	2.63
NPK-S	2.88	3.91	4.71	4.33	3.96
N--SS	1.93	1.53	1.85	1.78	1.77
NP-SS	1.79	2.32	3.06	2.50	2.42
N-KSS	2.20	2.88	3.22	2.91	2.80
NPKSS	3.03	3.90	4.67	4.23	3.96
C(--)	1.89	2.41	2.64	2.25	2.30
C(P-)	1.94	2.79	3.40	2.94	2.77
C(-K)	2.22	3.03	3.19	3.02	2.87
C(PK)	2.62	3.75	4.49	3.89	3.69
D	5.71	6.34	6.00	6.39	6.11
(D)	2.15	2.28	3.90	2.48	2.70
(A)	1.38	2.40	2.06	1.82	1.91
-	1.43	1.56	2.09	1.72	1.70
Mean	2.09	2.70	2.98	2.79	2.64

GRAIN MEAN DM% 86.7

90/R/HB/2

**STRAW TONNES/HECTARE**

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

N	0	48	96	144	Mean
<b>MANURE</b>					
---	0.26	0.30	0.57	0.40	0.38
-P-	0.61	0.83	0.87	0.84	0.79
--K	0.60	0.97	0.92	1.04	0.88
-PK	0.52	1.17	1.56	1.39	1.16
A--	0.43	0.17	0.47	0.40	0.37
AP-	0.71	0.66	0.74	0.75	0.72
A-K	0.56	0.72	0.58	0.73	0.65
APK	0.65	1.48	1.52	1.17	1.20
D	2.61	2.86	2.67	2.44	2.64
(D)	0.78	1.08	1.75	1.00	1.15
(A)	0.49	0.81	0.83	0.65	0.70
-	0.66	0.49	0.80	0.53	0.62
Mean	0.74	0.96	1.11	0.94	0.94

STRAW MEAN DM% 84.1

PLOT AREA HARVESTED 0.00154

**EXTRA PLOTS**

**GRAIN TONNES/HECTARE**

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

MANURE	551AN2PK	561--PK	571NN2--	581NN2--	Mean
<b>MAGNESIUM</b>					
0	3.85	1.22	2.88	1.59	2.39
35	4.13	1.26	2.76	1.55	2.43
Mean	3.99	1.24	2.82	1.57	2.41

GRAIN MEAN DM% 85.3

PLOT AREA HARVESTED 0.00329