

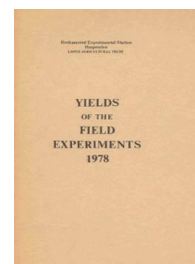
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Yields of the Field Experiments 1978

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78/R/HB/2 Hoosfield - Barley, Potatoes , Beans

Rothamsted Research

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78/R/HB/2

HOOSFIELD

Object: To study the effects of organic and inorganic manures on continuous spring barley. Since 1968 a rotation of potatoes, beans and barley has been included.

The 127th year, barley, potatoes and beans. The 11th year of revised scheme.

For previous years see 'Details' 1967 & 1973, Station Report for 1966, and 74-77/R/HB/2.

Treatments to barley: All combinations of:-

1. MANURE Fertilisers, organic manures and frequency of barley cropping:-

	Form of N 1852-1966	Additional treatments 1852-1978	
---CON	None	-	Continuous
-P-CON	None	P	Continuous
--KCON	None	K (Na) Mg	Continuous
-PKCON	None	P K (Na) Mg	Continuous
A--CON	A	-	Continuous
AP-CON	A	P	Continuous
A-KCON	A	K (Na) Mg	Continuous
APKCON	A	P K (Na) Mg	Continuous
N--CON	N	-	Continuous
N--SICON	N	- Si	Continuous
NP-CON	N	P	Continuous
NP-SICON	N	P Si	Continuous
N-KCON	N	K (Na) Mg	Continuous
N-KSICON	N	K (Na) Mg Si	Continuous
NPKCON	N	P K (Na) Mg	Continuous
NPKSICON	N	P K (Na) Mg Si	Continuous
C--CON	C	-	Continuous
C--RTN	C	-	In rotation (P, BE, B)
CP-CON	C	P	Continuous
CP-RTN	C	P	In rotation (P, BE, B)
C-KCON	C	K (Na) Mg	Continuous
C-KRTN	C	K (Na) Mg	In rotation (P, BE, B)
CPKCON	C	P K (Na) Mg	Continuous
CPKRTN	C	P K (Na) Mg	In rotation (P, BE, B)
DCON	None	D	Continuous
(D)CON	(D)	-	Continuous
(A)CON	(Ashes)	-	Continuous
-CON	None	-	Continuous

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).

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.

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

0
48
96
144

There are four extra plots testing all combinations of:-

1. MANURE Fertilisers other than magnesium:

551AN2PK	Plot 551	A N2 P K	Continuous
561--PK	Plot 561	- P K	Continuous
571NN2--	Plot 571	N N2	Continuous
581NN2--	Plot 581	N N2	Continuous

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

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

0
35

Treatments to potatoes and beans:- All combinations of:-

1. MANURE Fertiliser and organic manures:

To potatoes and beans:
1852-1966 1852-1978

C---	C	-	
CP--	C	P	
C-KMG	C	K (Na) Mg	
CPKMG	C	P K (Na) Mg	

To beans only:

N----	N	-	
N---SI	N		Si
NP---	N	P	
NP--SI	N	P	Si
N-KMG-	N	K (Na) Mg	
N-KMGSI	N	K (Na) Mg	Si
NPKMG	N	P K (Na) Mg	
NPKMGSI	N	P K (Na) Mg	Si

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2. NRES(77) N Nitrogen fertiliser (kg N), as 'Nitro-Chalk':

Beans	Potatoes	Beans (residual effects, applied to previous potatoes)	Potatoes (applied 1978)
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0	0		
96	96		
192	192		
288	288		

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

Standard applications:

Barley: Weedkillers: Glyphosate at 1.7 kg in 220 l. Ioxynil at 0.53 kg and mecoprop at 1.6 kg in 220 l applied with the fungicide. Fungicide: Tridemorph at 0.53 kg.

Potatoes: Manures: Chalk at 2.9 t. Weedkiller: Glyphosate at 1.7 kg in 220 l. Linuron at 1.1 kg in 220 l. Fungicides: Mancozeb at 1.3 kg in 220 l on three occasions, the second and third with insecticide. Fentin acetate and maneb ('Fennite A' at 1.7 kg) in 220 l on two occasions. Insecticide: Pirimicarb at 0.14 kg on two occasions.

Beans: Insecticide: Pirimicarb at 0.14 kg in 220 l.

Seed: Barley: Julia, dressed ethirimol, sown at 160 kg.

Potatoes: Pentland Crown.

Beans: Minden sown at 220 kg.

Cultivations, etc.:-

All plots: Autumn manures applied: 13 Dec, 1977. Ploughed: 14 Dec. Spring-tine cultivated: 10 Mar, 1978.

Barley: Glyphosate applied: 10 Oct, 1977. Seed sown (except 'Form of N 1852-1966' 'N and C' plots and 'extra' plots): 22 Mar, 1978. Seed sown on remaining plots: 30 Mar. N applied: 17 May. Ioxynil, mecoprop and tridemorph applied to all plots except 'Form of N 1852-1966' 'N and C' plots and 'extra' plots: 23 May. Remaining plots sprayed: 26 May. Combine harvested: 9 Sept.

Potatoes: Glyphosate applied: 10 Oct, 1977. Chalk applied: 11 Oct. N applied: 11 May, 1978. Spike rotary cultivated, potatoes planted: 12 May. Linuron applied: 15 May. Grubbed and rotary ridged: 19 June. Mancozeb applied: 5 July. Mancozeb and pirimicarb applied: 17 July, 4 Aug. 'Fennite A' applied twice: 17 Aug, 8 Sept. Lifted: 26 Oct.

Beans: Seed sown: 30 Mar, 1978. Tractor hoed twice: 19 May, 8 June.

Insecticide applied: 7 July. Combine harvested: 25 Sept.

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BARLEY

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

N	0	48	96	144	MEAN
MANURE					
---CON	0.76	1.53	1.68	1.92	1.47
-P-CON	1.78	3.62	4.11	4.04	3.39
--KCON	1.35	2.64	2.87	3.47	2.58
-PKCON	2.05	4.02	5.25	5.17	4.12
A--CON	1.23	1.22	1.97	2.12	1.63
AP-CON	2.35	3.18	3.14	3.04	2.93
A-KCON	1.09	2.35	2.12	2.37	1.98
APKCON	2.20	4.08	4.95	5.37	4.15
N--CON	1.41	1.98	2.32	2.29	2.00
N--SICON	2.31	3.37	3.74	4.58	3.50
NP-CON	2.65	4.18	3.74	3.90	3.62
NP-SICON	1.91	5.07	5.54	5.51	4.51
N-KCON	1.97	2.03	3.40	3.17	2.64
N-KSICON	2.01	4.01	5.39	4.68	4.02
NPKCON	2.45	4.35	4.77	5.59	4.29
NPKSICON	2.61	4.92	5.52	6.09	4.79
C--CON	2.14	4.21	4.87	4.84	4.01
C--RTN	3.32	5.09	5.57	5.12	4.77
CP-CON	2.65	4.83	5.50	5.04	4.50
CP-RTN	3.38	5.29	5.61	5.73	5.00
C-KCON	1.81	3.62	5.09	5.16	3.92
C-KRTN	2.64	5.20	5.29	5.11	4.56
CPKCON	2.79	4.89	5.47	5.50	4.66
CPKRTN	3.73	5.78	5.47	5.71	5.17
DCON	5.12	6.19	5.63	5.53	5.62
(D)CON	2.51	3.59	2.91	3.75	3.19
(A)CON	1.74	2.71	3.60	4.58	3.16
-CON	1.16	2.46	2.10	2.62	2.09
MEAN	2.25	3.80	4.20	4.36	3.65

GRAIN MEAN DM% 78.7

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BARLEY

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

N	0	48	96	144	MEAN
MANURE					
---CON	0.40	0.81	0.81	0.82	0.71
-P-CON	0.81	1.63	2.43	2.04	1.73
--KCON	0.40	2.00	1.82	2.25	1.62
-PKCON	1.02	2.45	3.69	3.26	2.60
A--CON	0.41	0.60	0.82	0.83	0.66
AP-CON	0.82	1.55	1.85	1.84	1.51
A-KCON	0.60	1.02	1.42	1.43	1.12
APKCON	1.02	2.46	3.07	3.08	2.41
N--CON	0.65	0.67	1.35	1.35	1.01
N--SICON	0.68	1.73	1.72	2.41	1.64
NP-CON	0.99	2.39	2.05	2.71	2.04
NP-SICON	0.68	2.05	2.45	2.78	1.99
N-KCON	0.67	1.34	1.35	2.02	1.34
N-KSICON	1.02	1.72	3.10	2.06	1.98
NPKCON	0.99	2.74	3.09	2.74	2.39
NPKSICON	1.01	2.42	3.46	3.47	2.59
C--CON	0.68	2.10	2.44	2.08	1.83
C--RTN	1.45	2.16	2.55	1.81	1.99
CP-CON	0.68	2.44	2.78	2.45	2.09
CP-RTN	0.72	2.17	2.86	2.88	2.16
C-KCON	1.02	2.05	2.06	2.77	1.97
C-KRTN	1.42	2.51	2.16	2.16	2.06
CPKCON	0.69	2.77	2.45	2.75	2.16
CPKRTN	2.12	2.87	2.51	1.80	2.33
DCON	3.00	3.57	4.41	3.25	3.56
(D)CON	1.36	2.16	2.71	3.23	2.36
(A)CON	0.54	1.36	1.63	2.47	1.50
-CON	0.54	1.36	1.59	1.63	1.28
MEAN	0.94	1.97	2.31	2.30	1.88

STRAW MEAN DM% 86.7

PLOT AREA HARVESTED 0.00007

78/R/HB/2

BARLEY

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

MANURE MAGNESIUM	551AN2PK	561--PK	571NN2--	581NN2--	MEAN
0	4.83	0.75	3.99	2.04	2.90
35	5.21	1.14	3.17	1.94	2.87
MEAN	5.02	0.95	3.58	1.99	2.88

GRAIN MEAN DM% 77.7

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

MANURE MAGNESIUM	551AN2PK	561--PK	571NN2--	581NN2--	MEAN
0	2.64	0.34	2.09	0.86	1.48
35	2.82	0.52	2.76	0.69	1.69
MEAN	2.73	0.43	2.42	0.77	1.59

STRAW MEAN DM% 89.9

PLOT AREA HARVESTED 0.00306

POTATOES

TOTAL TUBERS TONNES/HECTARE

***** TABLES OF MEANS *****

N MANURE	0	96	192	288	MEAN
C---	16.5	20.9	25.3	24.0	21.7
CP--	16.3	15.9	16.2	16.7	16.3
C-KMG	18.4	30.2	36.5	38.3	30.8
CPKMG	18.5	41.6	43.7	46.5	37.6
MEAN	17.4	27.1	30.4	31.4	26.6

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

***** TABLES OF MEANS *****

N MANURE	0	96	192	288	MEAN
C---	95.9	96.2	96.9	96.3	96.3
CP--	92.3	88.4	89.6	91.5	90.5
C-KMG	96.6	98.0	98.6	98.5	98.0
CPKMG	97.7	96.3	95.8	98.5	97.1
MEAN	95.6	94.8	95.2	96.2	95.5

PLOT AREA HARVESTED 0.00191

78/R/HB/2

BEANS

GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

NRES(77)	0	96	192	288	MEAN
MANURE					
C---	4.04	2.15	2.00	2.09	2.57
CP--	0.77	1.33	0.70	1.33	1.03
C-KMG	3.65	2.86	3.71	2.23	3.11
CPKMG	3.49	3.67	3.25	4.03	3.61
N----	0.41	0.55	0.74	0.41	0.53
N---SI	1.75	1.84	1.17	1.08	1.46
NP---	0.48	0.41	0.75	0.61	0.56
NP--SI	0.41	0.66	1.00	0.55	0.66
N-KMG-	1.80	1.79	2.41	0.97	1.74
N-KMGSI	3.17	2.05	3.19	1.23	2.41
NPKMG	2.53	2.35	1.17	2.83	2.22
NPKMGSI	2.60	2.54	3.26	3.48	2.97
MEAN	2.09	1.85	1.95	1.74	1.91

GRAIN MEAN DM% 83.6

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

NRES(77)	0	96	192	288	MEAN
MANURE					
C---	2.20	0.97	1.03	0.66	1.21
CP--	0.66	1.38	1.25	0.94	1.06
C-KMG	1.36	1.33	1.65	0.63	1.24
CPKMG	1.71	2.51	1.73	1.69	1.91
N----	0.29	0.30	0.57	0.75	0.48
N---SI	1.34	1.12	1.33	0.84	1.16
NP---	1.12	0.81	1.26	0.86	1.01
NP--SI	0.59	0.91	1.05	1.08	0.91
N-KMG-	1.19	0.97	1.49	0.58	1.06
N-KMGSI	1.28	1.33	1.30	1.32	1.30
NPKMG	1.94	1.87	1.19	1.63	1.66
NPKMGSI	1.60	2.29	2.00	2.06	1.98
MEAN	1.27	1.32	1.32	1.09	1.25

STRAW MEAN DM% 75.4

PLOT AREA HARVESTED 0.00143