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# Yields of the Field Experiments 1973

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## 73/R/HB/2 - Hoosfield - Potatoes, Beans, Barley

### Rothamsted Research

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73/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 122nd year, potatoes, beans and barley. The 6th year of revised scheme.

For previous years see 'Details' 1967, Station Report for 1966, 68/A/2(t), 69/R/HB/2(t), 70-72/R/HB/2.

Treatments to barley: All combinations of:- 1. Fertilisers, organic manures and frequency of barley cropping:- MANURE

Form of N 1852-1966	Additional treatments 1852-1973		MANURE
None	-	Continuous	---CON
None	P	Continuous	-P-CON
None	K Na Mg	Continuous	--KCON
None	P K Na Mg	Continuous	-PKCON
A	-	Continuous	A--CON
A	P	Continuous	AP-CON
A	K Na Mg	Continuous	A-KCON
A	P K Na Mg	Continuous	APKCON
N	-	Continuous	N--CON
N	- Si	Continuous	N--SiCON
N	-	In rotation (P, BE, B)	N--RTN
N	- Si	In rotation (P, BE, B)	N--SiRTN
N	P	Continuous	NP-CON
N	P Si	Continuous	NP-SiCON
N	P	In rotation (P, BE, B)	NP-RTN
N	P Si	In rotation (P, BE, B)	NP-SiRTN
N	K Na Mg	Continuous	N-KCON
N	K Na Mg Si	Continuous	N-KSiCON
N	K Na Mg	In rotation (P, BE, B)	N-KRTN
N	K Na Mg Si	In rotation (P, BE, B)	N-KSiRTN
N	P K Na Mg	Continuous	NPKCON
N	P K Na Mg Si	Continuous	NPKSiCON
N	P K Na Mg	In rotation (P, BE, B)	NPKRTN
N	P K Na Mg Si	In rotation (P, BE, B)	NPKSiRTN
C	-	Continuous	C--CON
C	-	In rotation (P, BE, B)	C--RTN
C	P	Continuous	CP-CON
C	P	In rotation (P, BE, B)	CP-RTN
C	K Na Mg	Continuous	C-KCON
C	K Na Mg	In rotation (P, BE, B)	C-KRTN
C	P K Na Mg	Continuous	CPKCON
C	P K Na Mg	In rotation (P, BE, B)	CPKRTN
None	D	Continuous	DCON
(D)	-	Continuous	(D)CON
(Ashes)	-	Continuous	(A)CON
None	-	Continuous	-CON

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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: Superphosphate to supply 34 kg P.  
 K: Sulphate of potash to supply 90 kg K.  
 Na: Sulphate of soda to supply 16 kg Na.  
 Mg: Sulphate of magnesia to supply 11 kg Mg.  
 Si: Silicate of soda at 448 kg.  
 D: Farmyard manure at 35 tonnes, (D): until 1871 only.  
 (Ashes): Weed ash 1852-1916, Furnace ash 1917-1932. None since.

2. Nitrogen fertiliser (kg N), as 'Nitro-Chalk', since 1968	N
None	0
48	48
96	96
144	144

There are four extra plots:-

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

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

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

1. Fertiliser and organic manures:

			MANURE
1852-1966	1852-1973		
C	-		C--
C	P		CP-
C	K Na Mg		C-K
C	P K Na Mg		CPK

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

			N
Beans (residual effects, applied to previous barley)	Potatoes (applied 1973)		
None	None	Beans	Potatoes
48	96	(0)	0
96	192	(48)	96
144	288	(96)	192
		(144)	288

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

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Standard applications:

Potatoes: Weedkiller: Linuron at 1.1 kg plus paraquat at 0.42 kg ion in 450 l. Fungicide: Mancozeb at 1.35 kg in 370 l on three occasions. Insecticide: Demeton-s-methyl at 0.25 kg applied with the mancozeb on the first occasion.  
Spring beans: Insecticide: Demeton-s-methyl at 0.25 kg in 370 l.  
Barley: Weedkiller: Dicamba, mecoprop and MCPA ('Tetralix Plus' at 7.0 l in 220 l).

Seed: Potatoes: King Edward, Rothamsted once grown.  
Spring beans: Maris Bead, sown at 220 kg.  
Barley: Julia, seed dressed with ethirimol, sown at 160 kg.

Cultivations, etc.: - Fertilisers, except N, applied: 1 Nov, 1972.  
FYM applied: 3 Nov. Ploughed: 6 Nov. N applied: 22 Mar, 1973.  
Potatoes: Planted: 6 Apr, 1973. Weedkiller applied: 15 May.  
Fungicide plus insecticide applied: 2 July. Fungicide applied: 18 July, 9 Aug. Haulm destroyed mechanically, sprayed with indiluted BCV at 220 l: 31 Aug. Lifted: 26 Sept.  
Spring beans: Seed sown: 8 Mar, 1973. Insecticide applied: 8 June.  
Combine harvested: 3 Sept.  
Barley: Seed sown: 8 Mar, 1973. Weedkiller applied: 11-15 May.  
Combine harvested: 10 Aug.

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TABLES OF MEANS

BARLEY

GRAIN: TONNES/HECTARE

	0	48	96	144	Mean
MANURE					
---CON	0.57	1.42	1.64	1.53	1.29
-P-CON	1.06	2.77	3.27	2.88	2.49
--KCON	0.49	2.94	3.75	4.25	2.86
--PKCON	0.84	3.59	5.09	5.29	3.70
A--CON	1.01	1.07	1.05	1.25	1.10
AP-CON	1.27	2.40	2.25	1.89	1.95
A-KCON	0.85	2.21	2.09	1.98	1.78
APKCON	1.11	3.48	4.66	4.97	3.56
N--CON	1.22	1.59	1.73	1.52	1.52
N--SICON	1.38	3.38	5.12	4.10	3.50
N--RIN	2.89	4.66	4.33	4.19	4.02
N--SIRIN	3.97	5.00	5.06	5.04	4.77
NP-CON	1.77	3.52	4.04	3.89	3.31
NP-SICON	1.66	4.29	5.31	4.71	3.99
NP-RIN	4.12	5.36	5.70	5.27	5.11
NP-SIRIN	4.91	6.05	6.08	5.69	5.68
N-KCON	1.24	2.31	2.99	3.04	2.39
N-KSICON	1.56	3.55	4.66	5.15	3.73
N-KRIN	3.15	4.55	4.73	5.10	4.38
N-KSIRIN	3.70	5.00	5.86	5.59	5.04
NPKCON	1.38	3.86	5.11	5.11	3.87
NPKSICON	1.75	4.18	5.28	4.57	3.95
NPKRIN	3.81	5.65	5.55	5.69	5.18
NPKSIRIN	3.82	5.64	5.43	5.86	5.19
C--CON	1.53	3.63	4.82	5.01	3.75
C--RIN	3.50	4.87	5.37	5.25	4.75
CP-CON	2.01	4.12	4.52	4.59	3.81
CP-RIN	4.30	5.68	5.83	4.83	5.16
C-KCON	1.59	3.78	4.97	5.50	3.96
C-KRIN	3.27	4.87	5.57	5.16	4.72
CPKCON	2.14	4.21	5.08	4.88	4.08
CPKRIN	4.51	5.76	5.00	5.32	5.15
DCON	6.02	5.45	5.73	4.95	5.54
(D)CON	1.12	3.40	5.76	5.08	3.84
(A)CON	0.90	3.36	3.50	4.21	2.99
-CON	0.73	1.82	2.44	3.06	2.02

Mean D.M. % 82.5

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BARLEY

STRAW: TONNES/HECTARE

	0	48	96	144	Mean
MANURE					
---CON	0.19	0.95	1.15	1.13	0.85
-P-CON	0.58	1.53	1.90	2.11	1.53
--KCON	0.19	1.86	2.82	3.64	2.13
-PKCON	0.37	2.30	3.80	4.54	2.75
A--CON	0.38	0.56	0.74	0.77	0.61
AP-CON	0.56	1.29	1.53	1.92	1.33
A-KCON	0.57	1.53	1.32	1.69	1.28
APKCON	0.76	1.95	3.83	3.79	2.58
N--CON	0.55	0.84	0.85	0.56	0.70
N--SICON	0.56	1.69	2.55	1.99	1.70
N--RTN	1.11	1.69	2.20	2.22	1.81
N--SIRTN	1.67	1.97	2.27	2.50	2.10
NP-CON	0.83	1.67	2.24	2.24	1.74
NP-SICON	0.56	1.97	2.29	2.54	1.84
NP-RTN	1.95	2.53	2.78	3.08	2.58
NP-SIRTN	2.23	2.77	3.32	3.42	2.93
N-KCON	0.28	1.38	1.63	1.69	1.24
N-KSICON	0.57	1.39	2.24	2.79	1.75
N-KRTN	1.40	2.18	2.80	2.75	2.28
N-KSIRTN	1.67	2.80	3.34	3.62	2.86
NPKCON	0.54	1.92	3.06	3.69	2.30
NPKSICON	0.57	1.98	3.34	3.36	2.31
NPKRTN	1.39	3.08	3.90	3.60	2.99
NPKSIRTN	1.69	3.40	3.63	3.65	3.09
C--CON	0.29	1.43	1.71	2.58	1.50
C--RTN	0.85	2.30	2.26	2.86	2.07
CP-CON	0.56	1.71	2.23	2.57	1.76
CP-RTN	1.44	2.82	2.83	2.88	2.49
C-KCON	0.57	1.69	2.85	3.39	2.13
C-KRTN	1.42	2.28	2.84	3.02	2.39
CPKCON	0.55	1.94	3.05	3.38	2.23
CPKRTN	1.67	2.82	3.13	3.71	2.83
DCON	4.91	4.48	4.59	5.30	4.82
(D)CON	0.49	2.06	3.78	3.32	2.41
(A)CON	0.51	2.02	1.99	2.54	1.76
-CON	0.51	1.27	1.73	2.30	1.45

Mean D.M. % 81.2

73/R/HB/2

BARLEY

EXTRA

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

GRAIN: TONNES/HECTARE

5.32      0.94      3.93      2.16

STRAW: TONNES/HECTARE

3.53      0.64      2.12      1.43

73/R/HE/2

POTATOES

N

	0	96	192	288	Mean
TOTAL TUBERS: TONNES/HECTARE					
MANURE					
C--	17.1	17.2	16.0	28.8	19.8
CP-	18.3	15.3	16.3	23.4	18.3
C-K	33.6	23.1	41.5	42.2	35.1
CPK	23.9	36.1	41.6	41.7	35.8
Mean	23.2	22.9	28.9	34.0	27.3
PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE					
C--	87.5	82.6	83.7	91.5	86.3
CP-	83.1	78.4	74.9	87.0	80.9
C-K	95.2	90.9	94.9	94.5	93.9
CPK	88.2	90.4	93.9	92.0	91.1
Mean	88.5	85.6	86.9	91.3	88.1



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BEANS

N

	(0)	(48)	(96)	(144)	Mean
GRAIN: TONNES/HECTARE					
MANURE					
C--	4.03	3.97	3.90	3.38	3.82
CP-	1.90	2.00	2.30	2.18	2.10
C-K	3.93	3.37	3.33	3.79	3.60
CPK	4.51	4.65	4.88	4.06	4.53
Mean	3.59	3.50	3.60	3.35	3.51
STRAW: TONNES/HECTARE					
C--	0.94	1.59	1.28	0.63	1.11
CP-	1.20	0.59	0.91	1.21	0.98
C-K	1.56	1.58	1.92	1.91	1.74
CPK	2.55	2.85	3.02	2.37	2.70
Mean	1.56	1.65	1.78	1.53	1.63

Mean D.M. % Grain: 83.5  
 Straw: 82.9