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Yields of the Field Experiments 1975

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

Rothamsted Research

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75/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 12th year, potatoes, beans and barley. The 8th year of revised scheme.

For previous years see 'Details' 1967, Station Report for 1966, 68/A/2(t), 69/R/HB/2(t) and 70-74/R/HB/2.

Treatments to barley: All combinations of:-

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

Form of N 1852-1966	Additional treatments 1852-1975	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	P	Continuous NP-CON
N	P Si	Continuous NP-SICON
N	K (Na) Mg	Continuous N-KCON
N	K (Na) Mg Si	Continuous N-KSICON
N	P K (Na) Mg	Continuous NPKCON
N	P K (Na) Mg Si	Continuous NPKSICON
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: 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 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. Nitrogen fertiliser (kg N), as 'Nitro-Chalk', since 1968 (cumulative N applications until 1973, on a cyclic system since 1974): N

None	0
48	48
96	96
144	144

There are four extra plots testing all combinations of:-

1. Fertilisers other than magnesium:

MANURE

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.

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

MAGNESIUM

None	0
35	35

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

1. Fertiliser and organic manures:

MANURE

To potatoes and beans:

1852-1966 1852-1975

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

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To beans only:

MANURE

1852-1966 1852-1975

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

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

Beans (residual effects, applied to previous potatoes)	Potatoes (applied 1975)	NRESID Beans	N Potatoes
None	None	(0)	0
96	96	(96)	96
192	192	(192)	192
288	288	(288)	288

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

Standard applications:

Potatoes: Weedkillers: Linuron at 1.1 kg plus paraquat at 0.42 kg ion in 450 l. Fungicide: Mancozeb at 1.3 kg applied with demeton-s-methyl on second occasion. Insecticide: Demeton-s-methyl at 0.25 kg in 450 l on two occasions.
Spring beans: Insecticide: Demeton-c-methyl at 0.25 kg in 450 l.
Barley: Weedkiller: Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 220 l).

Seed: Potatoes: King Edward, once grown Rothamsted seed.
Spring beans: Minor, sown at 220 kg.
Barley: Julia, sown at 160 kg.

Cultivations, etc.:-

All crops: P applied: 25 Nov, 1974. K, silicate of soda and FYM applied: 8 Jan, 1975. Ploughed: 10 Jan. Spring-tine cultivated: Once 10 Feb, twice 24 Feb.
Potatoes: N applied: 29 Apr. Spike rotary cultivated, seed machine planted: 7 May. Grubbed: 13 May. Linuron and paraquat applied: 4 June. Insecticide applied and grubbed: 27 June. Rotary ridged: 18 July. Fungicide and insecticide applied: 21 July. Haulm mechanically destroyed: 16 Sept. Lifted: 19 Sept.
Spring beans: Seed sown and spring-tine cultivated: 25 Mar. Tractor hoed: 16 May and 24 June. Insecticide applied: 9 July. Combine harvested: 29 Aug.
Barley: Seed sown and spring-tine cultivated: 25 Feb. N applied: 29 Apr. Weedkiller applied: 20 May. Combine harvested: 7 Aug.

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POTATOES

TOTAL TUBERS TONNES/HECTARE

*** TABLES OF MEANS ***

N	0	96	192	288	MEAN
MANURE					
C---	4.8	5.7	6.4	7.9	6.2
CP--	5.6	5.1	5.7	5.9	5.6
C-KMG	7.0	7.6	9.0	11.1	8.6
CPKMG	8.6	11.4	12.4	10.7	10.8
MEAN	6.5	7.4	8.4	8.9	7.8

PERCENTAGE WARE 3.81CM(1.5INCH) RIDDLE

*** TABLES OF MEANS ***

N	0	96	192	288	MEAN
MANURE					
C---	62.0	67.6	69.9	78.8	69.6
CP--	63.2	51.5	56.5	58.4	57.4
C-KMG	69.9	61.4	68.4	65.9	66.4
CPKMG	65.5	70.5	72.2	75.1	70.8
MEAN	65.1	62.8	66.7	69.6	66.0

PLOT AREA HARVESTED 0.00191

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BEANS

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

NRESID	(0)	(96)	(192)	(288)	MEAN
MANURE					
C---	0.90	0.91	0.81	1.01	0.91
CP--	0.80	0.65	0.77	0.65	0.72
C-KMG	0.39	1.46	0.77	0.96	0.89
CPKMG	1.11	1.03	1.19	1.23	1.14
N----	0.65	0.59	0.49	0.74	0.62
N---SI	0.65	0.69	0.77	0.56	0.67
NP---	0.39	0.45	0.60	0.62	0.51
NP--SI	0.45	0.36	0.45	0.38	0.41
N-KMG-	1.01	0.83	0.85	1.10	0.95
N-KMGS I	1.13	1.07	0.92	1.01	1.03
NP KMG-	0.95	0.98	0.95	0.98	0.96
NP KMGS I	1.17	0.92	1.15	0.97	1.05
MEAN	0.80	0.83	0.81	0.85	0.82

GRAIN MEAN DM% 87.9

PLOT AREA HARVESTED 0.00143

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BARLEY

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

	N	0	48	96	144	MEAN
MANURE						
--CON	1.03	2.04	2.50	2.73	2.09	
-P-CON	1.35	3.09	3.97	4.40	3.20	
--KCON	0.71	2.30	3.24	2.81	2.26	
-PKCON	1.13	2.93	4.40	4.05	3.13	
A--CON	1.08	1.56	2.00	2.16	1.70	
AP-CON	2.13	3.47	3.61	2.86	3.02	
A-KCON	0.96	1.84	2.03	2.58	1.85	
APKCON	1.65	3.29	4.66	4.88	3.62	
N--CON	1.13	1.29	1.60	2.45	1.62	
N--SICON	1.15	3.19	2.69	3.17	2.55	
NP-CON	2.11	3.34	4.25	4.18	3.47	
NP-SICON	1.70	3.08	3.87	4.82	3.37	
N-KCON	1.34	2.24	2.23	2.59	2.10	
N-KSICON	1.33	2.52	3.62	4.79	3.07	
NPKCON	1.29	3.34	4.59	4.47	3.42	
NPKSICON	1.58	3.45	4.76	4.86	3.66	
C--CON	1.37	3.12	4.17	4.05	3.18	
C--RTN	2.75	4.44	4.78	4.58	4.14	
CP-CON	2.16	3.36	4.80	4.79	3.78	
CP-RTN	2.65	4.09	4.22	4.28	3.81	
C-KCON	1.06	2.56	3.74	4.44	2.96	
C-KRTN	1.66	2.52	4.01	3.76	2.99	
CPKCON	1.48	3.73	4.51	4.87	3.65	
CPKRTN	2.61	4.06	5.10	4.73	4.13	
DCON	2.79	4.26	5.08	4.46	4.15	
(D)CON	0.74	2.91	3.02	2.81	2.37	
(A)CON	1.43	2.37	2.97	2.96	2.43	
-CON	0.88	1.59	2.03	2.22	1.68	
MEAN	1.54	2.93	3.66	3.78	2.98	

GRAIN MEAN DM% 86.0

75/R/HB/2

BARLEY

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

N	0	48	96	144	MEAN
MANURE					
--CON	0.35	0.88	0.87	1.02	0.78
-P-CON	0.53	1.20	1.42	1.57	1.18
--KCON	0.17	1.05	1.35	1.18	0.94
-PKCON	0.52	1.20	2.25	2.05	1.50
A--CON	0.35	0.70	0.70	1.04	0.70
AP-CON	0.52	1.43	1.23	1.23	1.11
A-KCON	0.35	0.69	0.86	1.04	0.73
APKCON	0.52	1.21	2.11	2.19	1.51
N--CON	0.67	0.65	0.66	1.00	0.74
N--SICON	0.65	1.32	1.00	1.30	1.07
NP-CON	0.66	1.31	1.98	1.96	1.48
NP-SICON	0.66	1.33	1.63	1.99	1.40
N-KCON	0.33	1.00	0.97	1.31	0.90
N-KSICON	0.66	0.66	2.00	2.28	1.40
NPKCON	0.66	1.70	2.32	2.26	1.74
NPKSICON	0.67	1.68	2.31	1.99	1.66
C--CON	0.68	1.02	1.70	1.99	1.35
C--RTN	1.02	2.02	2.36	1.98	1.84
CP-CON	0.68	1.35	2.36	2.00	1.60
CP-RTN	1.35	1.67	1.91	2.02	1.74
C-KCON	0.33	1.01	1.68	2.37	1.35
C-KRTN	1.00	1.38	2.02	2.03	1.61
CPKCON	0.69	1.70	2.37	2.35	1.78
CPKRTN	1.02	2.37	2.70	2.72	2.20
DCON	1.35	2.03	2.91	2.62	2.22
(D)CON	0.20	1.15	1.37	1.36	1.02
(A)CON	0.47	0.93	1.17	1.40	0.99
-CON	0.23	0.72	0.93	1.37	0.81
MEAN	0.62	1.26	1.68	1.77	1.33

STRAW MEAN DM% 87.1

75/R/HB/2

BARLEY

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

MANURE MAGNESIUM	551AN2PK	561--PK	571NN2-	581NN2-	MEAN
0	4.15	0.48	2.33	1.70	2.17
35	5.05	0.47	2.01	1.65	2.29
MEAN	4.60	0.47	2.17	1.67777	2.23

GRAIN MEAN DM% 82.6

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

MANURE MAGNESIUM	551AN2PK	561--PK	571NN2-	581NN2-	MEAN
0	1.80	0.14	0.88	0.60	0.85
35	2.13	0.13	0.83	0.75	0.97
MEAN	1.96	0.13	0.83	0.67	0.91

STRAW MEAN DM% 82.7