ROTHAMSTED RESEARCH

Yields of the Field Experiments 1981

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81/R/HB/2 Hoosfield - S. Barley

Rothamsted Research

Rothamsted Research (1982) *81/R/HB/2 Hoosfield - S. Barley ;* Yields Of The Field Experiments 1981, pp 14 - 17 **- DOI: https://doi.org/10.23637/ERADOC-1-35**

81/R/HB/2

HOOSFIELD

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 130th year, s. barley.

For previous years see 'Details' 1967 & 1973, Station Report for 1966 and 74-80/R/HB/2.

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

	Form of N 1852-1966	Additional treatments 1852-1979	Changes since 1980	Number of barley crops since last non-cereal
---14F	None	-	-	14 after fallow
-P-14F	None	P	-	14 after fallow
--K14F	None	K(Na)Mg	-	14 after fallow
-PK14F	None	PK(Na)Mg	-	14 after fallow
A--14F	A	-	-	14 after fallow
AP-14F	A	P	-	14 after fallow
A-K14F	A	K(Na)Mg	-	14 after fallow
APK14F	A	PK(Na)Mg	-	14 after fallow
N----14F	N	-	-	14 after fallow
NP---14F	N	P	-	14 after fallow
N-K--14F	N	K(Na)Mg	-	14 after fallow
NPK--14F	N	PK(Na)Mg	-	14 after fallow
N--S-14F	N	Si	Si omitted	14 after fallow
NP-S-14F	N	P Si	"	14 after fallow
N-KS-14F	N	K(Na)MgSi	"	14 after fallow
NPKS-14F	N	PK(Na)MgSi	"	14 after fallow
N---S3BE	N	-	Si added	3 after beans
NP--S3BE	N	P	"	3 after beans
N-K-S3BE	N	K(Na)Mg	"	3 after beans
NPK-S3BE	N	PK(Na)Mg	"	3 after beans
N--SS3BE	N	Si	-	3 after beans
NP-SS3BE	N	P Si	-	3 after beans
N-KSS3BE	N	K(Na)MgSi	-	3 after beans
NPKSS3BE	N	PK(Na)MgSi	-	3 after beans
C(--)14F	C	-	PKMg omitted	14 after fallow
C(P-)14F	C	P	"	14 after fallow
C(-K)14F	C	K(Na)Mg	"	14 after fallow
C(PK)14F	C	PK(Na)Mg	"	14 after fallow
C(--)4BE	C	-	"	4 after beans
C(P-)4BE	C	P	"	4 after beans
C(-K)4BE	C	K(Na)Mg	"	4 after beans
C(PK)4BE	C	PK(Na)Mg	"	4 after beans
C(--)3BE	C	-	"	3 after beans
C(P-)3BE	C	P	"	3 after beans
C(-K)3BE	C	K(Na)Mg	"	3 after beans
C(PK)3BE	C	PK(Na)Mg	"	3 after beans
C(--)3PO	C	-	"	3 after potatoes
C(P-)3PO	C	P	"	3 after potatoes
C(-K)3PO	C	K(Na)Mg	"	3 after potatoes
C(PK)3PO	C	PK(Na)Mg	"	3 after potatoes

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D14F	None	D	PKMg omitted	14 after fallow
(D)14F	(D)	-	"	14 after fallow
(A)14F	(Ashes)	-	"	14 after fallow
-14F	None	-	"	14 after fallow

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

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 AN2PK	14th barley
561--PK	Plot 561 --PK	14th barley
571NN2--	Plot 571 NN2	14th barley
581NN2--	Plot 581 NN2	14th barley

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

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

0
35

NOTES: (1) For a fuller record see 'Details' etc.
(2) Chalk was applied at 2.9 t to plots in 3rd barley after potatoes.

Basal applications: Weedkillers: Paraquat at 0.84 kg ion in 250 l. Mecoprop with ioxynil and bromoxynil (as 'Brittox' at 2.5 l) in 250 l applied with the fungicide. Fungicide: Tridemorph at 0.53 kg.

Seed: Georgie, sown at 160 kg.

Cultivations, etc.:- Paraquat applied: 1 Sept, 1980. Chalk applied: 7 Oct. P, K, and silicate of soda applied: 1 Dec. FYM applied, ploughed: 3 Dec. Spring-tine cultivated, seed sown: 17 Feb, 1981. N applied: 21 Apr. 'Brittox' applied: 12 May. Combine harvested: 17 and 18 Aug.

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BARLEY

GRAIN TONNES/HECTARE

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

N	0	48	96	144	MEAN
MANURE					
---14F	1.19	1.50	1.87	1.69	1.56
-P-14F	1.55	3.93	3.63	3.02	3.03
--K14F	1.26	1.95	3.05	3.41	2.42
-PK14F	1.57	4.12	4.77	5.01	3.87
A--14F	0.79	0.95	1.66	1.75	1.29
AP-14F	2.03	3.20	3.07	3.08	2.84
A-K14F	1.02	1.74	2.48	2.59	1.96
APK14F	1.57	4.08	5.07	4.75	3.87
N----14F	0.56	1.55	1.40	1.75	1.31
NP---14F	1.97	4.03	4.29	3.49	3.45
N-K--14F	1.13	1.89	2.79	3.22	2.26
NPK--14F	1.96	4.30	5.02	4.68	3.99
N--S-14F	1.70	1.97	3.32	3.69	2.67
NP-S-14F	2.06	4.05	4.34	3.92	3.59
N-KS-14F	1.55	3.69	3.91	4.39	3.39
NPKS-14F	1.98	3.84	5.20	5.61	4.16
N---S3BE	2.17	2.79	3.63	3.91	3.12
NP--S3BE	2.62	4.76	5.15	4.83	4.34
N-K-S3BE	1.80	3.67	3.89	4.48	3.46
NPK-S3BE	2.39	4.87	5.70	5.19	4.54
N--SS3BE	2.12	3.12	4.04	4.18	3.37
NP-SS3BE	2.63	4.68	5.39	4.83	4.38
N-KSS3BE	2.26	4.10	4.76	4.58	3.93
NPKSS3BE	2.25	4.78	5.47	5.25	4.44
C(--)14F	1.70	3.26	4.08	3.42	3.11
C(P-)14F	1.78	4.27	4.58	3.65	3.57
C(-K)14F	2.12	3.99	4.36	4.86	3.83
C(PK)14F	2.06	4.20	4.78	4.78	3.96
C(--)4BE	2.28	3.77	4.08	4.17	3.58
C(P-)4BE	1.42	4.01	4.23	4.17	3.46
C(-K)4BE	1.35	3.77	4.94	4.50	3.64
C(PK)4BE	1.70	4.55	4.95	4.94	4.03
C(--)3BE	2.20	4.13	4.44	4.38	3.79
C(P-)3BE	2.11	4.42	5.08	4.36	3.99
C(-K)3BE	2.27	3.98	5.15	5.01	4.10
C(PK)3BE	2.98	4.78	5.57	5.23	4.64
C(--)3PO	1.77	3.79	4.10	4.14	3.45
C(P-)3PO	2.06	3.77	4.58	4.09	3.63
C(-K)3PO	2.06	4.20	4.85	4.71	3.96
C(PK)3PO	2.42	4.19	5.06	5.37	4.26
D14F	4.45	6.12	5.54	5.37	5.37
(D)14F	1.50	2.72	3.64	5.09	3.24
(A)14F	1.26	2.43	4.19	3.31	2.80
-14F	0.78	2.16	2.33	2.31	1.90
MEAN	1.87	3.59	4.19	4.12	3.44

GRAIN MEAN DM% 86.6

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BARLEY

STRAW TONNES/HECTARE

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

N MANURE	0	48	96	144	MEAN
---14F	0.61	0.60	0.81	0.60	0.66
-P-14F	0.41	1.23	1.64	1.21	1.12
--K14F	0.40	0.79	1.00	1.20	0.85
-PK14F	0.39	1.83	2.03	2.42	1.67
A--14F	0.41	0.41	0.60	0.82	0.56
AP-14F	0.81	1.01	1.23	1.02	1.02
A-K14F	0.40	0.61	0.80	1.00	0.70
APK14F	0.76	1.84	2.68	2.47	1.94
D14F	2.37	2.70	2.44	2.19	2.42
(D)14F	0.51	1.30	1.07	2.17	1.26
(A)14F	0.54	1.07	1.63	1.33	1.14
-14F	0.52	0.79	0.79	0.79	0.72
MEAN	0.68	1.18	1.39	1.44	1.17

STRAW MEAN DM% 88.9

PLOT AREA HARVESTED 0.00007

GRAIN TONNES/HECTARE

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

MANURE MGNESIUM	551AN2PK	561--PK	571NN2--	581NN2--	MEAN
0	4.32	0.36	2.53	1.39	2.15
35	4.50	0.49	2.42	1.83	2.31
MEAN	4.41	0.43	2.47	1.61	2.23

GRAIN MEAN DM% 85.9

PLOT AREA HARVESTED 0.00306

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