ROTHAMSTED RESEARCH

Yields of the Field Experiments 1985

Full Table of Content

Experiments - Classicals

Rothamsted Research

Rothamsted Research (1986) *Experiments - Classicals ;* Yields Of The Field Experiments 1985, pp 9 - 43 **- DOI: https://doi.org/10.23637/ERADOC-1-19**

85/R/BK/1

BROADBALK

Object: To study the effects of organic and inorganic manures on continuous w. wheat. From 1968 two three-year rotations were included: potatoes, beans, w. wheat and fallow, w. wheat, w. wheat. In 1979 the first rotation was changed to fallow, potatoes, w. wheat. In 1980 the second rotation reverted to continuous w. wheat. In 1985 part of the second rotation was added to the first to extend the rotation to fallow, potatoes, w. wheat, w. wheat, w. wheat.

The 142nd year, w. wheat, fallow, potatoes.

For previous years see 'Details' 1967 and 1973, Station Report for 1966, pp. 229-231, Station Report for 1968, Part 2, 74-84/R/BK/1.

Areas harvested:

	Section	
Wheat:	0	0.00434
	1	0.00798
	2,3,6,and 7	0.00659
	8 and 9	0.00694
Potatoes:	4	0.00659

Treatments:

Whole plots

PLOT	Plot	Fertilizers and organic manures:- Treatments until 1967	Treatments from 1968	Treatments from 1985
01DN4PK	01	-	D N2 P K	D N4 P K
21DN2	21	D	D N2	D N2
22D	22	D	D	D
030	03	None	None	None
05F	05	P K Na Mg	P K (Na) Mg	PK Mg
06N1F	06	N1 P K Na Mg	N1 P K (Na) Mg	N1 P K Mg
07N2F	07	N2 P K Na Mg	N2 P K (Na) Mg	N2 P K Mg
08N3F	08	N3 P K Na Mg	N3 P K (Na) Mg	N3 P K Mg
09N4F	09	N*1 P K Na Mg	N4 P K (Na) Mg	N4 P K Mg
10N2	10	N2	N2	N2
11N2P	11	N2 P	N2 P	N2 P
12N2PNA	12	N2 P Na	N2 P Na	N2 P Na
13N2PK	13	N2 P K	N2 P K	N2 P K
14N2PKMG	14	N2 P Mg	N2 P K Mg	N2 P K Mg
15N5F	15	N2 P K Na Mg	N3 P K (Na) Mg	N5 P K Mg
16N6F	16	N*2 P K Na Mg	N2 P K (Na) Mg	N6 P K Mg
17NO+3FH	17	N2(A)	N2 1/2(P K (Na) Mg)	NO+3 1/2(PK Mg)+
18N1+3FH	18	P K Na Mg(A)	N2 1/2(P K (Na) Mg)	N1+3 1/2(PK Mg)+
19C	19	C	C	C
20NKMG	20	N2 K Na Mg	N2 K (Na) Mg	N2 K Mg

(A) Alternating

\+ This change since 1980. Treatments shown are those to w. wheat; autumn N alternates. Potatoes receive N3 1/2 (PK Mg) on both Plots 17 and 18.

https://doi.org/10.23637/ERADOC-1-19

85/R/BK/1

N1,N2,N3,N4,N5,N6: 48, 96, 144, 192, 240, 288 kg N (as sulphate of ammonia until 1967, except N* which was nitrate of soda. All as 'Nitro-Chalk' in spring from 1968)
N0+3; N1+3: None in autumn + 144 kg N in spring; 48 kg N in autumn + 144 kg N in spring
P: 35 kg P as single superphosphate (triple superphosphate in 1974)
K: 90 kg K as sulphate of potash
Na: 55 kg Na as sulphate of soda
(Na): 16 kg Na as sulphate of soda until 1973
Mg: 30 kg Mg annually to Plot 14, 35 kg Mg every third year to other plots since 1974. All as kieserite since 1974, previously as sulphate of magnesia annually
D: Farmyard manure at 35 tonnes
C: Castor meal to supply 96 kg N
F: P K (Na) Mg H: Half rate

Strips of sub-plots: Until 1967 wheat alone was grown on the experiment, with some bare fallowing on strips of sub-plots. From 1968, ten sub-plots were started with the following cropping:-

SECTION	Section	68	69	70, 71, 72, 73, 74, 75, and 76	77	78	79	80	81	82	83	84	85
SC0/W34	0	W	W	W	W	W	W	W	W	W	W	W	W
SC1/W19	1	W	W	W	W	W	W	W	W	W	W	W	W
SC2/W2P	2	BE	W	P	BE	W	F	P	W	F	P	W	W
SC3/W6	3	W	W	F	W	W	F	W	W	W	W	W	W
POTATOES	4	W	P	BE	W	P	P	W	F	P	W	F	P
-	5	W	F	W	W	F	W	W	W	W	W	W	F
SC6/W8	6+	F	W	W	F	W	W	W	W	W	W	W	W
SC7/W1P	7	P	BE	W	P	BE	W	F	P	W	F	P	W
SC8/W4	8*	W	W	W	W	W	W	W	F	W	W	W	W
SC9/W27	9	W	W	W	W	W	W	W	W	W	W	W	W

W = w. wheat, P = potatoes, BE = s. beans, F = fallow

\+ No sprays, except weedkillers, since 1985 * No weedkillers

NOTES: (1) For a fuller record of treatments see 'Details' etc.
(2) Since autumn 1975 chalk is applied at 2.9 t each autumn to sets of Sections on a three-year cycle.
Year 1: Sections 1,2,3. Year 2: Sections 6,7,8 and 9.
Year 3: Sections 0,4,5. Chalk is applied to all plots of each section.
(3) 'Nitro-Chalk' (26% N) was used for Plot 18 in autumn 1984; 'Nitro-Chalk' (27.5% N) for all spring applications.

https://doi.org/10.23637/ERADOC-1-19 *pp 3*

85/R/BK/1

Standard applications:
W. wheat: Manures: Sections 1, 2 and 3 only: Chalk at 2.9 t. Weedkillers (not applied to section 8): Isoproturon at 2.0 kg with mecoprop at 1.6 kg, bromoxynil at 0.20 kg and ioxynil at 0.20 kg in 200 l. Fungicides (not applied to section 6): Prochloraz at 0.40 kg and carbendazim at 0.15 kg in 200 l applied with the growth regulator. Fenpropimorph at 0.75 kg with captafol at 1.3 kg in 200 l. Propiconazole at 0.12 kg with carbendazim and maneb (as 'Septal' at 2.5 kg) in 200 l. Insecticide (not applied to section 6): Pirimicarb at 0.14 kg in 200 l. Growth regulator (not applied to section 6): Chlormequat at 1.3 kg.
Potatoes: Weedkillers: Linuron at 1.3 kg with paraquat at 0.50 kg ion in 500 l. Fungicides: Mancozeb at 1.4 kg in 200 l on four occasions, with the insecticide on the second and third occasions. Fentin hydroxide at 0.28 kg in 200 l. Insecticide: Pirimicarb at 0.14 kg on two occasions. Haulm desiccant: Diquat at 0.80 kg ion in 500 l.

Seed: W. wheat: Brimstone, sown at 190 kg.
Potatoes: Pentland Crown.

Cultivations, etc.:-
All sections: Sulphate of soda, kieserite and castor meal applied: 18 Sept, 1984. Sulphate of potash, superphosphate applied: 28 Sept. FYM applied, ploughed: 1 Oct. Spring-tine cultivated: 16 Oct.
Cropped Sections:
W. wheat: Chalk to sections 1, 2 and 3: 8 Sept, 1984. Autumn N treatment applied: 28 Sept. Rotary harrowed, seed sown: 31 Oct. Weedkillers applied (except section 8): 10 Apr, 1985. Spring N treatments applied: 18 Apr. Prochloraz, carbendazim and the growth regulator applied (except section 6): 19 Apr. Fenpropimorph and captafol applied (except section 6): 14 June. Propiconazole and 'Septal' applied (except section 6): 2 July. Insecticide applied (except section 6): 17 July. Combine harvested: 6 Sept.
Potatoes: N treatments applied: 19 Apr, 1985. Rotary harrowed, potatoes planted: 24 Apr. Weedkillers applied: 17 May. Mancozeb applied: 20 June, 6 Aug. Mancozeb with the insecticide applied: 3 July, 23 July. Fentin hydroxide applied: 21 Aug. Haulm mechanically destroyed: 3 Sept. Haulm desiccant applied: 5 Sept. Lifted: 17 Sept.
Fallow: Ploughed: 2 May, 15 July, 1985. Spring-tine cultivated: 16 May, 2 Aug.

NOTE: The percentage weights of weed seeds in the recorded grain yields of plots in section 8 were measured. On five plots these exceeded 3% (Plot 22 6%; Plot 03 5%; Plots 05 and 06 20% and Plot 9 16%). No adjustments to yields have been made.

https://doi.org/10.23637/ERADOC-1-19

85/R/BK/1 W.WHEAT

GRAIN TONNES/HECTARE

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

SECTION PLOT	SC7/W1P	SC2/W2P	SC8/W4	SC3/W6	SC6/W8	SC1/W19	SC9/W27	SC0/W34	MEAN
01DN4PK	9.28	8.86	*	8.22	7.20	*	*	*	8.39
21DN2	9.83	9.91	8.88	9.12	8.43	8.64	9.37	9.48	9.21
22D	8.27	7.42	7.10	7.37	6.91	7.58	7.98	7.66	7.54
030	2.99	1.95	1.93	1.80	1.47	1.77	1.78	2.41	2.01
05F	3.57	2.00	3.69	1.88	1.58	1.54	1.67	1.62	2.19
06N1F	5.82	4.93	4.44	4.99	4.14	4.57	4.97	5.02	4.86
07N2F	7.30	6.97	5.60	6.56	6.24	7.54	6.92	7.52	6.83
08N3F	7.69	8.58	6.53	8.06	6.40	8.12	8.19	7.79	7.67
09N4F	8.51	8.41	7.46	8.04	6.56	8.21	7.89	7.09	7.77
10N2	3.19	6.10	4.73	4.40	4.19	3.46	3.58	4.06	4.21
11N2P	4.36	6.62	3.73	4.33	3.84	5.76	3.55	5.62	4.73
12N2PNA	4.77	6.59	4.55	5.60	4.98	5.65	3.75	6.06	5.24
13N2PK	6.51	6.65	5.06	6.29	5.68	6.81	6.79	6.38	6.27
14N2PKMG	7.24	6.87	5.33	6.71	6.18	6.87	6.90	7.08	6.65
15N5F	7.92	8.87	6.46	7.74	6.48	8.34	7.42	7.85	7.64
16N6F	8.44	8.72	7.15	8.58	6.64	8.23	7.45	7.53	7.84
17NO+3FH	8.85	8.10	6.49	7.66	7.26	8.06	7.40	7.68	7.69
18N1+3FH	9.47	8.65	7.68	7.95	7.31	8.10	7.21	7.54	7.99
19C	4.95	3.14	4.39	3.32	2.54	3.50	3.93	2.74	3.57
20NKMG	*	*	*	*	*	3.05	*	3.31	3.18

GRAIN MEAN DM% 77.7

STRAW TONNES/HECTARE

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

SECTION PLOT	SC7/W1P	SC1/W19	MEAN
01DN4PK	6.91	*	6.91
21DN2	6.49	6.25	6.37
22D	4.83	4.79	4.81
030	1.24	0.84	1.04
05F	1.37	0.84	1.10
06N1F	2.78	3.15	2.97
07N2F	3.89	3.57	3.73
08N3F	4.44	4.27	4.35
09N4F	5.46	4.78	5.12
10N2	0.99	2.98	1.98
11N2P	1.88	2.25	2.06
12N2PNA	2.14	2.31	2.23
13N2PK	3.42	3.39	3.41
14N2PKMG	4.01	3.42	3.71
15N5F	5.61	5.41	5.51
16N6F	6.56	5.59	6.07
17NO+3FH	5.39	4.45	4.92
18N1+3FH	6.39	4.60	5.50
19C	2.06	2.10	2.08
20NKMG	*	1.60	1.60

STRAW MEAN DM% 74.3

https://doi.org/10.23637/ERADOC-1-19

85/R/BK/1 POTATOES

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

PLOT	TOTAL TUBERS TONNES/ HECTARE	% WARE 3.81 CM(1.5 INCH) RIDDLE
01DN2PK	44.6	96.7
21DN2	48.8	93.7
22D	41.1	95.3
030	6.4	71.3
05F	12.4	80.0
06N1F	21.0	78.0
07N2F	19.7	82.7
08N3F	37.8	94.7
09N4F	43.4	95.7
10N2	10.4	89.7
11N2P	13.0	75.2
12N2PNA	14.1	77.0
13N2PK	19.8	79.6
14N2PKMG	37.5	93.6
15N5F	43.2	95.7
16N6F	48.5	96.2
17N3FH	24.1	91.5
18N3FH	29.5	94.9
19C	14.2	86.1

https://doi.org/10.23637/ERADOC-1-19

85/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 134th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and 74-84/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	-	-

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

https://doi.org/10.23637/ERADOC-1-19

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', 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. MGNESIUM Magnesium fertilizer (kg Mg) as kieserite every third year since 1974:

0
35

NOTES: (1) 'Nitro-Chalk' (27.5% N) was used in 1985. Smaller N analyses were used in earlier years.
(2) For a fuller record see 'Details' etc.

Basal applications: Manures: Chalk at 2.9 t. Weedkillers: Clopyralid at 0.05 kg and bromoxynil octanoate at 0.24 kg with mecoprop at 1.7 kg and the fungicide in 500 l. Fungicide: Tridemorph at 0.52 kg.

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

Cultivations, etc.:- Chalk applied: 1 Oct, 1984. Silicate of soda applied: 30 Oct. P applied: 21 Nov. K applied: 26 Nov. FYM applied, ploughed: 27 Nov. Spring-tine cultivated: 12 Mar, 1985. Spring-tine cultivated, seed sown: 13 Mar. N applied: 22 Apr. Weedkillers and fungicide applied: 9 May. Combine harvested: 23 Aug.

https://doi.org/10.23637/ERADOC-1-19

85/R/HB/2

BARLEY

GRAIN TONNES/HECTARE

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

N / MANURE	0	48	96	144	MEAN
---	1.15	1.79	1.77	2.02	1.68
-P-	2.46	4.13	3.20	3.39	3.29
--K	1.88	3.29	4.88	4.13	3.55
-PK	2.29	5.31	6.55	6.28	5.11
A--	1.04	1.91	1.58	1.89	1.61
AP-	2.39	2.95	2.00	2.80	2.54
A-K	1.83	2.94	3.52	3.11	2.85
APK	2.69	5.10	6.60	6.58	5.24
N----	1.53	1.67	2.10	2.08	1.84
NP---	2.96	3.31	3.10	3.31	3.17
N-K--	1.72	2.93	3.08	3.30	2.76
NPK--	2.47	5.54	7.09	6.51	5.40
N--S-	1.67	3.15	3.94	4.24	3.25
NP-S-	3.04	5.01	4.58	4.07	4.18
N-KS-	2.54	5.01	4.69	4.70	4.23
NPKS-	2.96	5.27	6.76	6.51	5.38
N---S	1.50	3.34	2.70	2.70	2.56
NP--S	2.86	5.09	5.17	5.36	4.62
N-K-S	2.37	3.46	3.72	4.09	3.41
NPK-S	2.36	5.60	6.92	7.25	5.53
N--SS	1.79	2.66	2.76	2.67	2.47
NP-SS	2.91	5.28	5.17	5.40	4.69
N-KSS	2.08	3.78	4.74	4.35	3.74
NPKSS	2.86	5.40	7.23	6.70	5.55
C(--)	2.24	3.85	3.95	3.60	3.41
C(P-)	2.56	4.24	4.09	4.60	3.87
C(-K)	2.05	4.60	5.54	6.07	4.56
C(PK)	2.64	4.43	5.64	6.28	4.75
D	7.59	7.46	7.40	7.05	7.38
(D)	2.92	4.48	4.37	6.67	4.61
(A)	2.36	3.79	4.34	3.92	3.60
-	2.00	2.44	3.01	3.16	2.65
MEAN	2.43	4.04	4.44	4.52	3.86

GRAIN MEAN DM% 80.7

https://doi.org/10.23637/ERADOC-1-19

85/R/HB/2

BARLEY

STRAW TONNES/HECTARE

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

N / MANURE	0	48	96	144	MEAN
---	0.34	0.52	0.87	0.85	0.64
-P-	0.74	2.02	2.23	2.40	1.85
--K	0.67	1.85	2.75	2.43	1.93
-PK	0.69	2.52	3.89	3.99	2.77
A--	0.34	0.54	0.36	0.72	0.49
AP-	0.91	1.83	1.29	1.81	1.46
A-K	0.52	1.23	1.52	1.75	1.25
APK	0.87	2.28	3.75	3.94	2.71
D	4.06	4.97	5.62	5.31	4.99
(D)	0.71	2.07	2.40	4.37	2.39
(A)	0.69	1.67	2.41	2.66	1.86
-	0.71	1.80	1.65	1.76	1.48
MEAN	0.94	1.94	2.39	2.67	1.98

STRAW MEAN DM% 82.6

PLOT AREA HARVESTED 0.00007

BARLEY

GRAIN TONNES/HECTARE

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

MANURE / MGNESIUM	551AN2PK	561--PK	571NN2--	581NN2--	MEAN
0	5.03	1.32	4.12	2.33	3.20
35	6.04	1.52	3.72	2.83	3.53
MEAN	5.54	1.42	3.92	2.58	3.36

GRAIN MEAN DM% 82.0

PLOT AREA HARVESTED 0.00327

https://doi.org/10.23637/ERADOC-1-19

85/R/WF/3

WHEAT AND FALLOW

Object: To study the effects of fallowing on unmanured w. wheat - Hoosfield.

The 130th year, w. wheat.

For previous years see 'Details' 1967, 1973 and 74-84/R/WF/3.

Whole plot dimensions: 9.60 x 211.

Treatments:
Each year there are two plots, one is sown to w. wheat, one is fallow; they alternate in successive years.

Standard applications:
Wheat plot: Weedkillers: Clopyralid at 0.10 kg with bromoxynil and ioxynil (as 'Deloxil' at 0.70 l) in 500 l.

Seed: Brimstone, sown at 190 kg.

Cultivations, etc.:-
Wheat plot: Ploughed: 1 Oct, 1984. Rotary harrowed, seed sown: 1 Nov. Weedkillers applied: 10 June, 1985. Combine harvested: 6 Sept.
Fallow plot: Ploughed: 1 Oct, 1984 and 2 May, 1985. Rolled: 7 May. Spring-tine cultivated: 16 May, 14 June. Ploughed: 15 July. Spring-tine cultivated: 2 Aug.

GRAIN AND STRAW TONNES/HECTARE

	GRAIN	STRAW
YIELD	0.27	0.23
MEAN DM%	67.2	77.1
PLOT AREA HARVESTED	0.06009	

https://doi.org/10.23637/ERADOC-1-19

85/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures, applied 1856-1901, on the yield of continuous s. barley - Hoosfield.

The 130th year, s. barley.

For previous years see 'Details' 1967, 1973 and 74-84/R/EX/4.

Treatments: All combinations of:-

Whole plots

1. PLOTFERT(01) Plot numbers and manuring 1876-1901:

1-	Plot 1 none
2-	Plot 2 None
3D	Plot 3 D
4D	Plot 4 D
5N	Plot 5 N
6N*	Plot 6 N*
7NMIN	Plot 7 N P K Na Mg
8N*MIN	Plot 8 N* P K Na Mg
9P	Plot 9 P
10MIN	Plot 10 P K Na Mg

N - 96 kg N as ammonium salts
N* - 96 kg N as nitrate of soda
P - 34 kg P as superphosphate
K - 137 kg K as sulphate of potash
Na - 16 kg Na as sulphate of soda
Mg - 11 kg Mg as sulphate of magnesia
D - Farmyard manure at 35 tonnes
MIN - P K Na Mg

Sub plots

2. N Nitrogen fertilizer (kg N) as 'Nitro-Chalk' (27.5% N) (basal until 1975, on a cyclic system since 1976):

0
48
96
144

For a fuller record of treatments see 'Details' 1967 etc.

Basal applications: Weedkillers: Clopyralid at 0.10 kg with bromoxynil and ioxynil (as 'Deloxil' at 0.70 l) in 500 l. Fungicide: Tridemorph at 0.52 kg in 200 l.

https://doi.org/10.23637/ERADOC-1-19 *pp 12*

85/R/EX/4

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

Cultivations, etc.:- Ploughed: 1 Oct, 1984. Spring-tine cultivated, seed sown: 18 Mar, 1985. N applied: 18 Apr. Weedkillers applied: 10 June. Fungicide applied: 28 June. Combine harvested: 23 Aug.

GRAIN TONNES/HECTARE

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

N PLOTFERT(01)	0	48	96	144	MEAN
1-	1.57	1.99	2.11	2.31	2.00
2-	1.38	2.35	2.31	2.42	2.12
3D	2.98	3.75	4.05	3.55	3.58
4D	2.95	3.63	3.86	4.24	3.67
5N	1.90	2.38	2.34	2.09	2.18
6N*	1.18	2.16	2.30	2.28	1.98
7NMIN	2.99	3.21	3.66	3.49	3.34
8N*MIN	2.23	3.00	3.58	3.93	3.18
9P	2.65	2.82	3.67	3.17	3.08
10MIN	1.73	3.41	3.73	3.28	3.04
MEAN	2.16	2.87	3.16	3.08	2.82

GRAIN MEAN DM% 77.2

STRAW TONNES/HECTARE

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

N PLOTFERT(01)	0	48	96	144	MEAN
1-	0.46	0.73	0.83	0.82	0.71
2-	0.39	0.81	0.85	0.91	0.74
3D	0.97	1.88	2.49	2.50	1.96
4D	0.95	1.79	2.78	2.65	2.04
5N	0.65	0.91	0.91	0.86	0.83
6N*	0.52	0.83	0.92	0.77	0.76
7NMIN	0.92	1.68	2.09	2.15	1.71
8N*MIN	1.03	1.82	3.07	2.12	2.01
9P	0.92	1.40	1.99	2.14	1.61
10MIN	1.15	2.24	2.55	2.81	2.19
MEAN	0.80	1.41	1.85	1.77	1.46

STRAW MEAN DM% 80.2

SUB PLOT AREA HARVESTED 0.00728

https://doi.org/10.23637/ERADOC-1-19

85/R/PG/5

PARK GRASS

Object: To study the effects of organic and inorganic manures and lime on old grass (for hay).

The 130th year, hay.

For previous years see 'Details' 1967 and 1973 and 74-84/R/PG/5.

Treatments: Combinations of:-

Whole plots

1. MANURE — Fertilizers and organic manures:

N1	Plot 1	N1
O(D)	Plot 2	None (D until 1863)
O/PLOT3	Plot 3	None
P	Plot 4-1	P
N2P	Plot 4-2	N2 P
N1MIN	Plot 6	N1 P K Na Mg
MIN	Plot 7	P K Na Mg
PNAMG	Plot 8	P Na Mg
N2MIN	Plot 9	N2 P K Na Mg
N2PNAMG	Plot 10	N2 P Na Mg
N3MIN	Plot 11-1	N3 P K Na Mg
N3MINSI	Plot 11-2	N3 P K Na Mg Si
O/PLOT12	Plot 12	None
D/F	Plot 13	D/F
N2*MIN	Plot 14	N2* P K Na Mg
MIN(N2*)	Plot 15	P K Na Mg (N2* until 1875)
N1*MIN	Plot 16	N1* P K Na Mg
N1*	Plot 17	N1*
N2KNAMG	Plot 18	N2 K Na Mg
D	Plot 19	D
D/N*PK	Plot 20	D/N*P K

N1, N2, N3:	48, 96, 144 kg N as sulphate of ammonia
N1*, N2*:	48, 96 kg N as nitrate of soda (30 kg N to Plot 20, only in years with no farmyard manure)
P:	35 kg P (15 kg P to Plot 20, only in years with no farmyard manure) as single superphosphate (triple superphosphate in 1974)
K:	225 kg K (45 kg K to Plot 20, only in years with no farmyard manure) as sulphate of potash
Na:	15 kg Na as sulphate of soda
Mg:	10 kg Mg as sulphate of magnesia
Si:	Silicate of soda at 450 kg
D:	Farmyard manure at 35 tonnes every fourth year
F:	Fish meal every fourth year to supply 63 kg N
MIN:	P K Na Mg

https://doi.org/10.23637/ERADOC-1-19

85/R/PG/5

Sub plots

2. LIME Liming:

A	a Ground chalk applied as necessary to achieve pH7
B	b Ground chalk applied as necessary to achieve pH6
C	c Ground chalk applied as necessary to achieve pH5
D	d None

NOTE: Lime was applied regularly, and at the same rate, to all a and b sub plots of Plots 1 to 17 (except 12) from 1924. Differential liming started in 1965 on certain b and c sub plots (except on Plot 12) and in 1976 on certain a sub plots (including Plot 12) and 12b.

Additional sub plots (Plots 18, 19 and 20 only) (tonnes CaCO3 applied every fourth year 1920-1964):

N2KNAMG0	18-1	None
N2KNAMG2	18-2	13.5
N2KNAMG1	18-3	7.9
D0	19-1	None
D2	19-2	6.3
D1	19-3	1.1
D/N*PK0	20-1	None
D/N*PK2	20-2	5.6
D/N*PK1	20-3	1.1

Since 1965 Plot 18-1 has been split into two for treatments 'c' and 'd' above and Plot 18-3 split into two for treatments 'a' and 'b'. The remaining sub plots of Plots 18, 19 and 20 are treated as 'a'.

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

Cultivations, etc.:- Mineral fertilizers (other than superphosphate) applied: 10 Dec, 1984. Superphosphate applied: 11 Dec. FYM applied: 8 Jan, 1985. N applied: 18 Apr. Cut: 1 July, 7 Nov.

https://doi.org/10.23637/ERADOC-1-19

85/R/PG/5

1ST CUT (1/7/85) DRY MATTER TONNES/HECTARE

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

LIME / MANURE	A	B	C	D	MEAN
N1	2.87	2.98	1.97	1.20	2.26
0(D)	2.62	3.27	2.06	1.70	2.41
0/PLOT3	2.26	3.13	1.44	1.58	2.10
P	3.53	3.70	3.59	3.26	3.52
N2P	3.89	3.79	4.21	2.86	3.69
N1MIN	6.10	5.77			5.94
MIN	5.28	5.20	4.77	3.75	4.75
PNAMG	3.30	3.47	3.88	3.89	3.64
N2MIN	5.48	5.94	4.86	5.08	5.34
N2PNAMG	4.04	4.56	5.14	3.45	4.30
N3MIN	5.95	6.09	7.08	3.58	5.67
N3MINSI	6.11	5.50	4.87	3.77	5.06
0/PLOT12	2.58	1.98	1.68	1.65	1.97
D/F	4.70	4.73	4.73	4.22	4.59
N2*MIN	5.77	5.49	5.32	5.32	5.47
MIN(N2*)	5.62	4.90	4.72	4.03	4.82
N1*MIN	5.18	5.42	4.84	4.00	4.86
N1*	3.10	3.52	3.45	2.98	3.26
N2KNAMG0			1.00	0.94	0.97
N2KNAMG2	2.83				2.83
N2KNAMG1	2.19	2.43			2.31
D0	5.01				5.01
D2	5.83				5.83
D1	5.56				5.56
D/N*PK0	5.45				5.45
D/N*PK2	5.57				5.57
D/N*PK1	4.59				4.59

1ST CUT MEAN DM% 22.1

https://doi.org/10.23637/ERADOC-1-19

85/R/PG/5

2ND CUT (7/11/85) DRY MATTER TONNES/HECTARE

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

LIME / MANURE	A	B	C	D	MEAN
N1	2.54	3.05	2.02	1.79	2.35
0(D)	2.21	3.02	2.51	2.67	2.60
0/PLOT3	2.14	3.09	2.10	2.96	2.57
P	2.69	2.76	3.28	3.30	3.01
N2P	2.27	2.54	2.37	1.95	2.28
N1MIN	3.96	3.73			3.84
MIN	4.26	4.62	3.34	3.23	3.86
PNAMG	4.50	3.69	4.15	4.35	4.17
N2MIN	3.66	3.18	2.89	2.73	3.11
N2PNAMG	2.46	2.43	2.33	1.90	2.28
N3MIN	4.26	3.66	3.47	6.29	4.42
N3MINSI	5.26	4.09	3.49	5.69	4.63
0/PLOT12	3.27	2.89	2.66	2.43	2.81
D/F	6.29	5.68	4.64	4.09	5.18
N2*MIN	3.27	3.58	3.32	2.61	3.20
MIN(N2*)	2.85	2.98	4.34	3.65	3.46
N1*MIN	3.08	3.16	3.24	2.49	2.99
N1*	2.55	2.92	3.22	2.46	2.78
N2KNAMG0			2.68	2.66	2.67
N2KNAMG2	3.23				3.23
N2KNAMG1	3.06	3.35			3.21
D0	4.34				4.34
D2	5.35				5.35
D1	4.61				4.61
D/N*PK0	4.59				4.59
D/N*PK2	4.79				4.79
D/N*PK1	3.87				3.87

2ND CUT MEAN DM% 39.8

https://doi.org/10.23637/ERADOC-1-19

85/R/PG/5

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

LIME / MANURE	A	B	C	D	MEAN
N1	5.41	6.04	3.99	2.99	4.61
0(D)	4.83	6.29	4.57	4.37	5.01
0/PLOT3	4.40	6.23	3.54	4.54	4.68
P	6.21	6.46	6.87	6.57	6.53
N2P	6.15	6.33	6.59	4.81	5.97
N1MIN	10.06	9.50			9.78
MIN	9.53	9.82	8.12	6.98	8.61
PNAMG	7.80	7.16	8.04	8.24	7.81
N2MIN	9.14	9.12	7.75	7.81	8.46
N2PNAMG	6.50	6.99	7.47	5.36	6.58
N3MIN	10.21	9.75	10.54	9.87	10.09
N3MINSI	11.37	9.59	8.37	9.46	9.70
0/PLOT12	5.86	4.88	4.33	4.08	4.79
D/F	10.99	10.41	9.37	8.31	9.77
N2*MIN	9.04	9.07	8.64	7.93	8.67
MIN(N2*)	8.47	7.88	9.06	7.68	8.27
N1*MIN	8.26	8.57	8.08	6.49	7.85
N1*	5.65	6.44	6.67	5.43	6.05
N2KNAMG0			3.68	3.60	3.64
N2KNAMG2	6.06				6.06
N2KNAMG1	5.24	5.78			5.51
D0	9.35				9.35
D2	11.17				11.17
D1	10.17				10.17
D/N*PK0	10.04				10.04
D/N*PK2	10.36				10.36
D/N*PK1	8.46				8.46

TOTAL OF 2 CUTS MEAN DM% 30.9

PLOT AREA HARVESTED 0.00002

https://doi.org/10.23637/ERADOC-1-19

AGDELL

Object: To study, by crop yields and soil analyses, the residual values of phosphate and potash applied in the period 1848-1951 and further dressings since 1964.

The 16th year of revised scheme, w. wheat.

For previous years see 'Details' 1967 and 1973, and 74-84/R/AG/6.

Treatments: All combinations of:-

Whole plots

1. OLDRESD — Fertilizers and organic manures applied to roots every fourth year, in the period 1848-1948:

NONE	None
PKNAMG	P K Na Mg
NPKNAMGC	N P K Na Mg C

N:	48 kg N as sulphate of ammonia
P:	41 kg P as superphosphate
K:	224 kg K as sulphate of potash
Na:	16 kg Na as sulphate of soda
Mg:	11 kg Mg as sulphate of magnesia
C:	Castor meal at 2240 kg supplying about 112 kg N

2. RN CROP — Rotation 1848-1951 and crop in 1984 (all w. wheat 1985):

F/WHEAT	With fallow: Roots (turnips or swedes), s. barley, fallow, w. wheat 1848-1951. Wheat in 1984.
L/FALLOW	With legume: Roots, s. barley, legume (clover or beans), w. wheat 1848-1951. Fallow in 1984.

Half plots

3. 1964RESD — Residues of 1964 treatments:

P
K

Quarter plots

4. PREVCROP — Previous cropping 1958-69 on P-test half plots, 1958-70 on K-test half plots:

ARABLE	Arable or fallow
GRASS	Grass

https://doi.org/10.23637/ERADOC-1-19

85/R/AG/6

Sixteenth plots

5. P205 64 K20 64 — Rates of 1964 treatments(kg):

P205 to P-test half plots	K20 to K-test half plots
0	0
500	315
1000	630
2000	1260

Thirty second plots

6. To RN CROP F/WHEAT. Residues of P205 applied 1970-72 (kg) and in 1979, 1981 and 1984 (kg):

P205 724

(0)0	None
(375)450	375 total in 1970-72, 150 in 1980, 1981 and 1984

To RN CROP F/WHEAT. Residues of K20 applied 1973-76 (kg) and in 1979, 1981 and 1984 (kg):

K20 764

(0)0	None
(870)900	870 total in 1973-76, 300 in 1980, 1982 and 1984

To RN CROP L/FALLOW. Residues of P205 applied 1970-72 (kg) and in 1980, 1982 and 1985 (kg):

P205 725

(0)0	None
(375)450	375 total in 1970-72, 150 in 1980, 1982 and 1985

To RN CROP L/FALLOW. Residues of K20 applied 1973-76 (kg) and in 1980, 1982 and 1985 (kg):

K20 765

(0)0	None
(870)900	870 total in 1973-76, 300 in 1980, 1982 and 1985

Standard applications: To P-test half plots: K20 at 300 kg. To K-test half plots: P205 at 150 kg.

Basal applications: Manures: 'Nitro-Chalk' (27.5% N) at 870 kg. Weedkillers: Paraquat at 0.60 kg ion in 250 l. Cyanazine at 0.24 kg with mecoprop at 1.6 kg in 200 l. Fungicides: Propiconazole at 0.25 kg with carbendazim and maneb (as 'Septal' at 2.5 kg) in 200 l.

Seed: Avalon, dressed fonofos, sown at 200 kg.

https://doi.org/10.23637/ERADOC-1-19 *pp 20*

85/R/AG/6

Cultivations, etc.:- Test and standard P and K applied: 25 July, 1984.
Paraquat applied: 11 Oct. Cultivated by rotary digger: 15 Oct.
Rotary harrowed, seed sown: 6 Feb, 1985. N applied: 15 Apr.
Cyanazine and mecoprop applied: 16 May. Fungicides applied: 3 July.
Combine harvested: 7 Sept.

WHEAT AFTER WHEAT P PLOTS

GRAIN TONNES/HECTARE

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

	OLDRESD	NONE		PKNAMG		NPKNAMGC	
	P205 724	(0)0	(375)450	(0)0	(375)450	(0)0	(375)450
PREVCROP	P205 64						
ARABLE	0	4.31	5.43	6.08	6.32	4.11	4.83
	500	5.23	6.46	6.46	6.87	5.24	6.04
	1000	6.55	7.24	6.35	6.33	3.91	5.58
	2000	5.11	6.43	6.53	6.39	5.77	5.47
GRASS	0	4.25	6.29	2.46	4.78	4.23	4.99
	500	5.66	5.93	4.72	6.23	3.53	5.84
	1000	5.11	6.62	4.47	6.02	5.84	6.30
	2000	6.13	7.14	6.78	7.10	6.70	5.71

GRAIN MEAN DM% 78.4

PLOT AREA HARVESTED (OLDRESD NONE) 0.00113
PLOT AREA HARVESTED (REMAINDER) 0.00127

WHEAT AFTER WHEAT K PLOTS

GRAIN TONNES/HECTARE

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

	OLDRESD	NONE		PKNAMG		NPKNAMGC	
	K20 764	(0)0	(870)900	(0)0	(870)900	(0)0	(870)900
PREVCROP	K20 64						
ARABLE	0	6.51	6.64	5.83	7.50	6.92	6.27
	315	6.05	7.02	6.91	6.49	5.94	5.87
	630	6.74	6.69	7.05	6.76	6.58	6.36
	1260	7.02	6.46	7.38	5.87	6.47	6.30
GRASS	0	5.58	7.06	6.23	6.58	6.11	6.64
	315	6.88	7.22	7.21	7.16	5.84	7.16
	630	6.82	6.73	5.99	6.60	6.23	6.49
	1260	6.73	7.18	7.72	6.83	6.43	6.41

GRAIN MEAN DM% 78.4

PLOT AREA HARVESTED (OLDRESD NONE) 0.00113
PLOT AREA HARVESTED (REMAINDER) 0.00127

https://doi.org/10.23637/ERADOC-1-19 *pp 21*

85/R/AG/6

WHEAT AFTER FALLOW P PLOTS

GRAIN TONNES/HECTARE

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

	OLDRESD	NONE		PKNAMG		NPKNAMGC	
	P205 725	(0)0	(375)450	(0)0	(375)450	(0)0	(375)450
PREVCROP	P205 64						
ARABLE	0	6.39	6.89	7.67	7.12	6.80	6.60
	500	6.86	7.18	7.61	7.32	6.06	7.29
	1000	7.48	7.29	7.23	7.45	8.10	7.21
	2000	7.11	7.18	7.76	7.32	6.97	6.88
GRASS	0	7.36	6.75	7.58	7.23	5.20	7.63
	500	7.22	6.40	6.48	7.34	7.03	7.51
	1000	6.68	6.73	6.94	7.62	7.47	7.74
	2000	7.02	6.78	7.01	7.21	7.81	7.39

GRAIN MEAN DM% 78.6

PLOT AREA HARVESTED (OLDRESD NONE) 0.00113
PLOT AREA HARVESTED (REMAINDER) 0.00127

WHEAT AFTER FALLOW K PLOTS

GRAIN TONNES/HECTARE

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

	OLDRESD	NONE		PKNAMG		NPKNAMGC	
	K20 765	(0)0	(870)900	(0)0	(870)900	(0)0	(870)900
PREVCROP	K20 64						
ARABLE	0	5.09	6.48	8.16	6.23	7.60	7.81
	315	5.54	7.20	7.31	7.15	7.21	7.07
	630	6.84	6.82	7.33	6.50	7.77	7.34
	1260	7.08	7.13	7.05	7.93	7.49	7.12
GRASS	0	7.00	6.43	3.53	6.54	7.21	7.54
	315	6.70	5.11	5.69	6.36	7.31	7.60
	630	6.84	6.87	7.46	5.05	6.97	7.88
	1260	6.88	3.79	7.20	7.27	6.82	7.86

GRAIN MEAN DM% 77.4

PLOT AREA HARVESTED (OLDRESD NONE) 0.00113
PLOT AREA HARVESTED (REMAINDER) 0.00127

https://doi.org/10.23637/ERADOC-1-19

85/R/BN/7

BARNFIELD

Object: The experiment was designed to study the effects of organic and inorganic manures on continuous root crops. It has been progressively modified to study effects on other crops.

Sections 1 and 2 the second year of grass/clover. The eleventh year of grass on the rest of the experiment.

For previous years see 'Details' 1967 and 1973 and 74-84/R/BN/7.

Plot dimensions: 10.7 x 55.9.

Treatments to grass: All combinations of:-

Whole plots

1. MANURE	Fertilizers and organic manures:
D	D
DPK	D P K
PKMG	P K (Na) Mg
P	P
PK	P K
PMG	P (Na) Mg
0	0

P: 35 kg P as single superphosphate (triple superphosphate in 1974)
K: 225 kg K as sulphate of potash
(Na): 90 kg Na as sodium chloride until 1973
Mg: 90 kg Mg as kieserite every fourth year since 1974 (sulphate of magnesia until 1973)
D: Farmyard manure at 35 tonnes (until 1975).

Quarter plots

2. N PERCUT	Nitrogen fertilizer in 1985 (kg N per cut) as 'Nitro-Chalk' (27.5% N) and residues of forms of N previously each supplying 96 kg N per annum:
75	75, previously nitrate of soda
100	100, previously sulphate of ammonia
125	125, previously sulphate of ammonia + castor meal
150	150, previously castor meal

Castor meal last applied 1961, nitrate of soda and sulphate of ammonia until 1959.

plus one plot MANURE KMG 100

Treatments to grass/clover (not given nitrogen fertilizer):

MANURE	Fertilizer and organic manures as for grass above, excluding KMG.

NOTES: (1) P K and D treatments were applied to Sections 1 and 2 until 1980. None were applied subsequently until the resumption of P and K treatments, only, for 1985.
(2) Yields were not taken from section 2.

https://doi.org/10.23637/ERADOC-1-19

85/R/BN/7

Cultivations, etc.:-
All sections: P applied: 13 Dec, 1984. K applied: 3 Jan, 1985. Cut: 29 May, 6 Nov.
Grass (Sections 3, 4, 5 and 6) only: N applied: 28 Mar, 31 May.

GRASS/CLOVER

1ST CUT (29/5/85) DRY MATTER TONNES/HECTARE

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

MANURE	D	DPK	PKMG	P	PK	PMG	0	MEAN
	3.46	2.99	3.77	3.29	3.31	2.62	1.63	3.01

1ST CUT MEAN DM% 13.7

2ND CUT (6/11/85) DRY MATTER TONNES/HECTARE

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

MANURE	D	DPK	PKMG	P	PK	PMG	0	MEAN
	5.14	5.18	4.32	3.92	4.47	4.46	2.45	4.28

2ND CUT MEAN DM% 33.2

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

MANURE	D	DPK	PKMG	P	PK	PMG	0	MEAN
	8.60	8.17	8.09	7.21	7.78	7.08	4.08	7.29

TOTAL OF 2 CUTS MEAN DM% 23.5

GRASS

1ST CUT (29/5/85) DRY MATTER TONNES/HECTARE

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

N PERCUT / MANURE	75	100	125	150	MEAN
D	5.00	6.25	6.04	5.65	5.74
DPK	5.79	5.94	5.73	5.78	5.81
PKMG	5.40	5.84	5.95	5.52	5.68
P	4.63	3.65	3.31	3.32	3.73
PK	5.12	5.63	5.59	5.30	5.41
PMG	4.58	3.98	3.61	3.57	3.94
0	3.97	3.75	3.18	3.56	3.61
MEAN	4.93	5.01	4.77	4.67	4.85

MANURE KMG 100 5.79

GRAND MEAN 4.88

1ST CUT MEAN DM% 19.3

https://doi.org/10.23637/ERADOC-1-19

85/R/BN/7

2ND CUT (6/11/85) DRY MATTER TONNES/HECTARE

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

N PERCUT MANURE	75	100	125	150	MEAN
D	3.32	6.10	6.49	6.88	5.70
DPK	4.04	6.14	6.36	6.97	5.88
PKMG	3.50	5.39	5.92	6.13	5.24
P	2.95	3.46	4.08	4.41	3.73
PK	3.68	5.74	6.58	6.02	5.50
PMG	3.19	3.50	4.55	4.15	3.85
0	2.39	3.47	4.64	4.34	3.71
MEAN	3.30	4.83	5.52	5.56	4.80

MANURE KMG 100 4.77

GRAND MEAN 4.80

2ND CUT MEAN DM% 51.5

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

N PERCUT MANURE	75	100	125	150	MEAN
D	8.31	12.35	12.53	12.53	11.43
DPK	9.83	12.08	12.09	12.75	11.69
PKMG	8.91	11.23	11.87	11.65	10.91
P	7.58	7.11	7.39	7.73	7.46
PK	8.80	11.37	12.16	11.32	10.91
PMG	7.78	7.48	8.16	7.72	7.79
0	6.36	7.22	7.82	7.90	7.32
MEAN	8.22	9.83	10.29	10.23	9.64

MANURE KMG 100 10.56

GRAND MEAN 9.68

TOTAL OF 2 CUTS MEAN DM% 35.4

SUB PLOT AREA HARVESTED 0.00568

https://doi.org/10.23637/ERADOC-1-19

85/R/GC/8

GARDEN CLOVER

Object: To study yields and pathogens of red clover grown continuously - Manor Garden.

Sponsor: J. McEwen.

The 132nd year, red clover.

For previous years see 'Details' 1967 and 1973, and 74-84/R/GC/8.

Design: 2 blocks of 2 plots.

Whole plot dimensions: 1.02 x 1.42.

Treatments:

FUNGCIDE	Fungicide to control Sclerotinia trifoliorum:
NONE	None
BENOMYL	Benomyl at 0.6 kg in 800 l on 30 Oct, 1984; 30 Nov, 21 Dec, and 27 Feb, 1985.

NOTE: An additional planned treatment application of benomyl in January was omitted because of snow.

Basal applications: Manures: Chalk at 1.25 t. (0:18:36) at 420 kg. Mg at 50 kg, as Epsom Salts. Nematicide: Aldicarb at 10 kg.

NOTE: Additional K was applied to replace that removed by the crop in 1984. FUNGCIDE NONE required 250 and 289 kg K20 to the first and second blocks respectively, FUNGCIDE BENOMYL 410 and 400 kg K20. This was applied as muriate of potash, one third in spring 1985 and one third after the first and second cuts.

Seed: Hungaropoly, sown at 34 kg in April 1983, gaps, 85% FUNGCIDE NONE, 8% FUNGCIDE BENOMYL, resown at 34 kg in April, 1984.

Cultivations, etc.:- Chalk, PK and Mg applied: 2 Nov, 1984. K and aldicarb applied: 2 Apr, 1985. Cut and K applied: 27 June, 6 Aug. Cut: 25 Sept.

https://doi.org/10.23637/ERADOC-1-19 *pp 26*

85/R/GC/8

1ST CUT (27/6/85) DRY MATTER TONNES/HECTARE

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

FUNGCIDE	NONE	BENOMYL	MEAN
	6.77	6.25	6.51

1ST CUT MEAN DM% 16.8

2ND CUT (6/8/85) DRY MATTER TONNES/HECTARE

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

FUNGCIDE	NONE	BENOMYL	MEAN
	4.65	5.02	4.84

2ND CUT MEAN DM% 16.2

3RD CUT (25/9/85) DRY MATTER TONNES/HECTARE

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

FUNGCIDE	NONE	BENOMYL	MEAN
	1.69	1.70	1.70

3RD CUT MEAN DM% 15.7

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

FUNGCIDE	NONE	BENOMYL	MEAN
	13.12	12.97	13.05

TOTAL OF 3 CUTS MEAN DM% 16.2

PLOT AREA HARVESTED 0.00010

https://doi.org/10.23637/ERADOC-1-19 *pp 27*

85/S/RN/1

ROTATION I

Object: To compare nutrient cycles, uptakes of nutrients and responses to fresh P and K. To obtain an estimate of the rate of release of nutrients, particularly K, from Saxmundham soil - Saxmundham.

Sponsor: A.E. Johnston.

The 86th year, grass, w. wheat, w. beans.

For previous years see 'Details' 1967 and 1973, and 74-84/S/RN/1.

Whole plot dimensions (original treatments): 5.49 x 40.2.

Treatments: From 1899 to 1969 the experiment followed a four-course rotation of w. wheat, roots, s. barley, legumes. Each phase of the rotation was present each year on a separate block. From 1966 each plot was divided. A small area at the south end continued under the original treatment until 1979, these plots were sown to grass in 1970, the treatments were discontinued after 1979 and yields no longer taken although the plots remain in grass. Modified treatments (NEWTREAT) were applied on the larger sub-plots from 1966 (see below).

In 1970 the rotation was stopped and each pair of blocks was divided for lucerne and grass (the original treatment sub-plots formed part of the grass area). In 1977 lucerne was ploughed on one pair of blocks to start an arable rotation testing fresh K to plots previously given none since 1899 (S/RN/1-2). In 1978 lucerne on the other pair of blocks was replaced by a grass/clover mixture; this was ploughed in 1979 for a continuing test of subsoil loosening and incorporation of PK to the subsoil (S/RN/1-3).

Since autumn 1980 the four sections of NEWTREAT grass have been ploughed up progressively to start a sequence of arable crops (S/RN/1-1) measuring the effects of soil K depletion. The sequence of crops has been:

Section	1970-80	1981	1982	1983	1984	1985
(a)	G	W	BE	W	W	W
(b)	G	G	G	BE	W	W
(c)	G	G	G	G	BE	W
(d)	G	G	G	G	G	BE

G = NEWTREAT grass, W = w. wheat, BE = w. beans.

https://doi.org/10.23637/ERADOC-1-19

85/S/RN/1

Treatments to crops in these sections were:

TREATMENT 1899-1965	NEWTREAT Grass 1966-1984	W. wheat and w. beans until 1984	W. wheat and w. beans 1985
	MANURE	MANURE	MANURE
D	(D)N	(D)P2	(D)P2
B	BN	B	BP2
N	(N)P2N	(N)P2	(N)P2
P	(P)P1N	(P)P1	(P1)P2
K	(K)P2KN	(K)P2K	(K)P2K
-	(-)P2N	(-)P2	(-)P2
PK	(PK)P1KN	(PK)P1K	(P1K)P2K
NK	(NK)P2KN	(NK)P2K	(NP2K)P2K
NP	(NP)P1N	(NP)P1	(NP1)P2
NPK	(NPK)P1KN	(NPK)P1K	(NP1K)P2K

D: Farmyard manure at 15 tonnes
(D): Farmyard manure at 30 tonnes, 60 tonnes in autumn 1969, none since
B: Bonemeal at 0.5 tonnes
N: 1899-1965, 38 kg N as nitrate of soda. Since 1970, 100 kg N as 'Nitro-Chalk' per cut of grass
P: 1899-1965, 40 kg P2O5 as single superphosphate. 1966-79, 50 kg P2O5 as triple superphosphate
P1, P2: 50, 100 kg P2O5 as triple superphosphate
K: 1899-1965, 63 kg K2O as muriate of potash. Since 1966, 126 kg K2O

W. wheat in Sections (a), (b) and (c) tested in addition to MANURE all the combinations with the following nitrogen rates (kg N) applied in spring as 'Nitro-Chalk' (26% N) on 17 Apr, 1985:

N(NC)
120
160
200
240

Part of the w. wheat in Section (b) tested in addition to MANURE all the combinations with the following nitrogen rates (kg N) applied on 17 Apr as prilled urea:

N(PU)
0
160
200

NOTE: All w. wheat in Sections (a), (b) and (c) was given 45 kg N to the seedbed, as prilled urea, in addition to the spring nitrogen rates. On S/RN/1-2 and S/RN/1-3 w. beans were grown, yields not taken.

https://doi.org/10.23637/ERADOC-1-19 *pp 29*

85/S/RN/1

Standard applications:

W. wheat, on S/RN/1-1. Manures: P205 at 100 kg (as triple superphosphate). N at 45 kg (as prilled urea). Weedkillers: Mecoprop at 1.2 kg, bromoxynil at 0.26 kg and ioxynil at 0.26 kg in 220 l (to Section (c) only). Mecoprop at 1.2 kg, bromoxynil at 0.26 kg and ioxynil at 0.26 kg with isoproturon at 2.1 kg applied with the prochloraz in 220 l. (To Sections (a), (b) and (c) but on Section (c) the isoproturon was applied separately and earlier). Fungicides: Prochloraz at 0.42 kg. Maneb at 1.6 kg, carbendazim at 0.15 kg and tridemorph at 0.37 kg with captafol at 1.0 kg applied with the insecticide in 220 l. Insecticide: Pirimicarb at 0.14 kg.

W. beans, on S/RN/1-1, S/RN/1-2 and S/RN/1-3: Manures: P205 at 100 kg (as triple superphosphate). Weedkillers: Simazine at 1.1 kg in 220 l (except to S/RN/1-3). Fungicide: Benomyl at 0.56 kg in 220 l.

Seed: W. wheat: Galahad, sown at 400 seeds per square metre.
W. beans: Banner, sown at 250 kg.

Cultivations, etc.:-

W. wheat: S/RN/1-1 (Sections (a) and (b) only). K and bonemeal treatments applied: 6 Sept, 1984. P applied: 13 Sept. Ploughed: 15 Sept. Power harrowed, seed sown, seedbed N applied: 17 Oct. N treatments applied: 17 Apr, 1985. Mecoprop, bromoxynil and ioxynil with isoproturon and prochloraz applied: 23 Apr. Remaining fungicides and insecticide applied: 26 June. Combine harvested: 28 Aug (Section (a)), 29 Aug (Section (b)).

W. wheat: S/RN/1-1 (Section (c)): P applied: 9 Oct, 1984. Ploughed, K and bonemeal treatments applied: 11 Oct. Power harrowed, seed sown, seedbed N applied: 30 Oct. Isoproturon applied: 31 Oct. Mecoprop, bromoxynil and ioxynil applied: 4 Dec. N treatments applied: 17 Apr, 1985. Mecoprop, bromoxynil and ioxynil with prochloraz applied: 23 Apr. Remaining fungicides and insecticide applied: 26 June. Combine harvested: 28 Aug.

W. beans: S/RN/1-1 (Section (d)): P applied: 9 Oct, 1984. Ploughed, K and bonemeal treatments applied: 11 Oct. Seed sown: 17 Oct. Weedkiller applied: 31 Oct. Fungicide applied: 22 Apr, 1985. Combine harvested: 16 Sept.

W. beans: S/RN/1-2 and S/RN/1-3: K and bonemeal treatments applied: 6 Sept, 1984. P applied: 13 Sept. Ploughed: 15 Sept (S/RN/1-2), 11 Oct (S/RN/1-3). Power harrowed, seed sown, weedkiller applied (S/RN/1-2 only): 17 Oct. Power harrowed, seed sown (S/RN/1-3 only): 31 Oct. Fungicide applied: 22 Apr, 1985. Combine harvested (yields not recorded): 19 Sept.

https://doi.org/10.23637/ERADOC-1-19 *pp 30*

85/S/RN/1

3RD W.WHEAT AFTER W.BEANS SECTION (a)

GRAIN TONNES/HECTARE

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

N(NC) MANURE	120	160	200	240	MEAN
(D)P2	7.38	6.51	6.18	7.09	6.79
BP2	4.62	5.43	4.62	4.39	4.77
(N)P2	5.63	6.25	5.94	4.36	5.54
(P1)P2	6.00	5.14	6.15	6.28	5.89
(K)P2K	7.02	7.00	7.37	6.67	7.01
(-)P2	6.40	4.93	5.90	6.77	6.00
(P1K)P2K	6.62	6.39	6.67	7.20	6.72
(NP2K)P2K	6.84	7.38	6.76	7.50	7.12
(NP1)P2	6.14	6.44	6.12	6.57	6.32
(NP1K)P2K	7.38	5.74	6.65	7.31	6.77
MEAN	6.40	6.12	6.24	6.41	6.29

GRAIN MEAN DM% 85.6

PLOT AREA HARVESTED 0.00073

2ND W. WHEAT AFTER W.BEANS SECTION (b)

GRAIN TONNES/HECTARE

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

N(NC) MANURE	120	160	200	240	MEAN
(D)P2	6.65	6.43	7.46	6.09	6.66
BP2	6.57	8.14	6.64	5.70	6.76
(N)P2	8.28	7.06	5.88	6.26	6.87
(P1)P2	7.77	7.22	6.74	7.40	7.28
(K)P2K	7.59	8.18	6.94	6.53	7.31
(-)P2	6.88	7.90	7.96	7.35	7.52
(P1K)P2K	7.70	8.86	7.30	7.24	7.78
(NP2K)P2K	8.25	7.22	8.50	8.63	8.15
(NP1)P2	7.42	8.21	7.96	7.01	7.65
(NP1K)P2K	7.48	7.96	6.91	7.88	7.56
MEAN	7.46	7.72	7.23	7.01	7.35

GRAIN MEAN DM% 82.4

PLOT AREA HARVESTED 0.00073

https://doi.org/10.23637/ERADOC-1-19

85/S/RN/1

2ND W. WHEAT AFTER W.BEANS SECTION (b)

GRAIN TONNES/HECTARE

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

N(PU) MANURE	0	160	220	MEAN
(D)P2	3.64	6.89	6.37	5.13
BP2	2.18	4.79	6.41	3.89
(N)P2	1.71	3.77	6.56	3.44
(P1)P2	1.52	7.40	4.49	3.73
(K)P2K	2.01	7.63	7.46	4.78
(-)P2	1.95	7.75	6.57	4.56
(P1K)P2K	1.92	8.41	7.01	4.81
(NP2K)P2K	1.71	8.69	7.34	4.86
(NP1)P2	1.17	6.22	6.89	3.86
(NP1K)P2K	2.04	7.93	7.29	4.82
MEAN	1.98	6.95	6.64	4.39

GRAIN MEAN DM% 81.7

PLOT AREA HARVESTED 0.00073

1ST W.WHEAT AFTER W.BEANS SECTION (c)

GRAIN TONNES/HECTARE

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

N(NC) MANURE	120	160	200	240	MEAN
(D)P2	7.04	8.28	8.17	7.07	7.64
BP2	6.96	7.33	6.09	7.88	7.06
(N)P2	6.96	7.62	8.05	7.51	7.54
(P1)P2	7.85	7.76	7.19	6.96	7.44
(K)P2K	8.26	8.63	8.98	9.74	8.90
(-)P2	8.21	8.00	7.64	8.25	8.03
(P1K)P2K	8.72	9.27	8.99	7.88	8.72
(NP2K)P2K	8.32	10.57	8.87	6.93	8.67
(NP1)P2	7.74	7.75	7.52	7.90	7.73
(NP1K)P2K	7.05	8.60	8.67	6.05	7.59
MEAN	7.71	8.38	8.02	7.62	7.93

GRAIN MEAN DM% 85.3

PLOT AREA HARVESTED 0.00073

https://doi.org/10.23637/ERADOC-1-19

85/S/RN/1

W. BEANS SECTION (d)

GRAIN TONNES/HECTARE

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

MANURE	
(D)P2	1.07
BP2	1.01
(N)P2	0.93
(P1)P2	0.93
(K)P2K	2.15
(-)P2	1.19
(P1K)P2K	2.28
(NP2K)P2K	2.14
(NP1)P2	0.95
(NP1K)P2K	1.98
MEAN	1.46

GRAIN MEAN DM% 80.7

PLOT AREA HARVESTED 0.00229

https://doi.org/10.23637/ERADOC-1-19

85/S/RN/2

ROTATION II

Object: To measure, by crop yields and soil analysis, the residual value of P applied as FYM or superphosphate in the periods 1899-1964 and 1965-1967 and of fresh dressings since - Saxmundham.

Sponsor: A.E. Johnston.

The 16th year of revised scheme, w. wheat, w. beans.

For previous years see 'Details' 1967 and 1973, and 74-84/S/RN/2.

Whole plot dimensions: 5.49 x 39.8.

Treatments: From 1899-1964 the experiment tested farmyard manure and nitrogen and phosphate fertilizers applied to a rotation of crops. Since 1965 the treatments have been changed to evaluate old residues of P (from FYM and superphosphate) and new residues from treatments applied 1965-1967. All crops of the rotation - potatoes, s. barley, sugar beet, s. barley - were grown until 1974. The whole experiment was sown to s. barley in 1975 and 1976, alternating w. wheat and s. barley from 1977 to 1979, alternating w. beans and w. wheat in 1980 and 1981, w. wheat alone in 1982 and 1983, w. wheat and w. beans in 1984. Combinations of the following treatments were tested on w. beans and on a first wheat after beans in 1984:

Whole plots

1. RESIDUE — Residues of previous treatments:-

		Approximate total dressing 1899-1964	Total dressing 1965-1967
(0)0	Plot 1	None	None
(D)0	Plot 2	400 tonnes FYM	None
(DP)0	Plot 3	400 tonnes FYM, 2.7 tonnes P205	None
(DP)D2	Plot 4	400 tonnes FYM, 2.7 tonnes P205	100 tonnes FYM
(DP)D2P1	Plot 5	400 tonnes FYM, 2.7 tonnes P205	100 tonnes FYM, 0.56 tonnes P205
(DP)P1	Plot 6	400 tonnes FYM, 2.7 tonnes P205	0.56 tonnes P205
(DP)P2	Plot 7	400 tonnes FYM, 2.7 tonnes P205	1.13 tonnes P205
(DP52)0	Plot 8	326 tonnes FYM, 4.3 tonnes P205 (until 1952 only)	None

https://doi.org/10.23637/ERADOC-1-19 *pp 34*

85/S/RN/2

Sub plots

2. P Phosphate (total P2O5 applied in each period (kg)):

	1969-71	1973-75	1978*	1980*	1982*	1984*
(0)(0)0	0	0	0	0	0	0
(0)(3)0	0	378	0	0	0	0
(1)(3)1	126	378	120	120	120	120
(2)(3)1	252	378	120	120	120	120
(3)(3)0	378	378	0	0	0	0

* 1978, 1980, 1982 and 1984 are the years of application for wheat in 1985. Years of application for beans in 1985 were 1979, 1981, 1983 and 1985.

and, for wheat only, some of the combinations of 2 with:-

3. N Nitrogen fertilizer in spring (kg N) as 'Nitro-Chalk' (26% N) in addition to 45 kg N at sowing:

120
160
200
240

NOTE: Plots with the combinations of RESIDUE (DP)D2, (DP)D2P1, (DP)P1, (DP)P2 with P(3)(3)(0) were used for N15 studies, yields not taken.

Standard applications:

W. wheat: Manures: N at 45 kg as prilled urea. Weedkillers: Isoproturon at 2.5 kg in 220 l. Mecoprop at 1.2 kg, bromoxynil at 0.26 kg and ioxynil at 0.26 kg applied with the prochloraz in 220 l. Fungicides: Prochloraz at 0.42 kg. Maneb at 1.6 kg, carbendazim at 0.15 kg and tridemorph at 0.37 kg with captafol at 1.0 kg applied with the insecticide in 220 l. Insecticide: Pirimicarb at 0.14 kg.

W. beans: Weedkiller: Simazine at 1.1 kg in 220 l. Fungicide: Benomyl at 0.56 kg in 220 l.

Seed: W. wheat: Galahad, sown at 400 seeds per square metre.
W. beans: Banner, sown at 250 kg.

Cultivations, etc.:-

W. wheat: Ploughed: 12 Oct, 1984. Power harrowed, seed sown, N applied: 30 Oct. Isoproturon applied: 31 Oct. N treatments applied: 17 Apr, 1985. Mecoprop, bromoxynil, ioxynil and prochloraz applied: 23 Apr. Remaining fungicides and insecticide applied: 26 June. Combine harvested: 29 Aug.

W. beans: P and chalk treatments applied: 6 Sept, 1984. Ploughed: 12 Oct. Power harrowed, seed sown, weedkiller applied: 31 Oct. Fungicide applied: 22 Apr, 1985. Combine harvested (yields not recorded): 19 Sept.

https://doi.org/10.23637/ERADOC-1-19 *pp 35*

85/S/RN/2

W.WHEAT AFTER BEANS

GRAIN TONNES/HECTARE

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

RESIDUE	N P	120	160	200	240
(0)0	(0)(0)0			4.97	6.95
(0)0	(0)(3)0	7.39	5.33		
(0)0	(1)(3)1	8.46		8.61	
(0)0	(2)(3)1		8.51		8.95
(0)0	(3)(3)0		8.89		8.19
(D)0	(0)(0)0	6.19	7.75		
(D)0	(0)(3)0			7.89	7.56
(D)0	(1)(3)1		8.34		8.30
(D)0	(2)(3)1	8.72		7.97	
(D)0	(3)(3)0	7.44		7.52	
(DP)0	(0)(0)0			8.88	8.94
(DP)0	(0)(3)0	7.65	8.54		
(DP)0	(1)(3)1	8.80		8.26	
(DP)0	(2)(3)1		8.88		8.45
(DP)0	(3)(3)0		8.45		8.96
(DP)D2	(0)(0)0	8.34	8.51		
(DP)D2	(0)(3)0			8.36	8.40
(DP)D2	(1)(3)1	9.45		9.05	
(DP)D2	(2)(3)1		9.13		9.49
(DP)D2	(3)(3)0		9.47		9.28
(DP)D2P1	(0)(0)0			7.98	8.79
(DP)D2P1	(0)(3)0	8.49	8.76		
(DP)D2P1	(1)(3)1	9.24		8.07	
(DP)D2P1	(2)(3)1		9.67		9.12
(DP)D2P1	(3)(3)0		10.15		7.97
(DP)P1	(0)(0)0			8.45	8.36
(DP)P1	(0)(3)0	8.22	9.48		
(DP)P1	(1)(3)1		9.41		8.03
(DP)P1	(2)(3)1	8.46		8.16	
(DP)P1	(3)(3)0	8.87		9.56	
(DP)P2	(0)(0)0	9.11	8.95		
(DP)P2	(0)(3)0			9.19	8.15
(DP)P2	(1)(3)1		9.92		8.47
(DP)P2	(2)(3)1	8.59		9.68	
(DP)P2	(3)(3)0	8.85		9.07	
(DP52)0	(0)(0)0	7.68	7.74		
(DP52)0	(0)(3)0			8.61	8.17
(DP52)0	(1)(3)1		8.92		8.84
(DP52)0	(2)(3)1	8.30		8.09	
(DP52)0	(3)(3)0	9.50		8.66	

GRAIN MEAN DM% 83.5

PLOT AREA HARVESTED 0.00073

https://doi.org/10.23637/ERADOC-1-19