

Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readable, or you suspect there are some problems, please let us know and we will correct that.



ROTHAMSTED
RESEARCH

Yields of the Field Experiments 1994

[Full Table of Content](#)



94/R/PG/5 Park Grass - Old Grass

Rothamsted Research

Rothamsted Research (1995) *94/R/PG/5 Park Grass - Old Grass* ; Yields Of The Field Experiments 1994, pp 26 - 31 - DOI: <https://doi.org/10.23637/ERADOC-1-49>

94/R/PG/5

PARK GRASS

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

The 139th year, hay.

For previous years see 'Details' 1967 and 1973 and 74-93/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	Plot 3	None
P	Plot 4/1	P
N2P	Plot 4/2	N2 P
N1MN	Plot 6	N1 P K Na Mg
MN	Plot 7	P K Na Mg
PNAMG	Plot 8	P Na Mg
MN(N2)	Plot 9/1	P K Na Mg (N2 until 1989)
N2MN	Plot 9/2	N2 P K Na Mg
N2PNAMG	Plot 10	N2 P Na Mg
N3MN	Plot 11/1	N3 P K Na Mg
N3MNSI	Plot 11/2	N3 P K Na Mg Si
O	Plot 12	None
D/F	Plot 13	D/F
MN(N2*)	Plot 14/1	P K Na Mg (N2* until 1989)
N2*MN	Plot 14/2	N2* P K Na Mg
MN(N2*)	Plot 15	P K Na Mg (N2* until 1875)
N1*MN	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 triple superphosphate in 1974 and since 1987, single superphosphate in other years
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
MN:	P K Na Mg

94/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. Lime last applied in 1994.

Chalk applied 1994 (tonnes CaCO₃):

Plot	a	b	c
1	7.0	1.5	0.8
2	7.0	-	0.3
3	7.0	-	0.3
4/1	7.0	-	0.3
4/2	12.1	8.6	3.6
6	7.0	1.5	-
7	7.0	-	0.3
8	7.0	-	0.3
9/1	21.0	11.5	8.8
9/2	15.1	8.6	5.1
10	12.1	8.6	5.1
11/1	22.0	10.5	9.0
11/2	14.0	10.5	9.0
12	3.0	0.8	0.3
13	5.0	-	0.3
14/1	7.0	-	-
14/2	2.2	-	-
15	3.0	0.8	1.3
16	2.2	-	-
17	2.2	-	-
18	12.1	6.6	8.1

None applied to plots 18/2, 19 and 20. This application was the first in a triennial scheme of soil pH analyses and chalk applications.

94/R/PG/5

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
DO	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'. Plots 19 and 20 received no further chalk after 1968; plot 18/2 no further chalk after 1972.

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

Experimental diary:

19-Nov-93 : T : P applied.
24-Nov-93 : T : K, Na, Mg and Si applied.
21-Jan-94 : T : Chalk application started.
08-Feb-94 : T : Chalk application finished.
21-Apr-94 : T : N applied.
27-Jun-94 : B : First sample cut. Remaining area cut for hay (started).
28-Jun-94 : B : Remaining area cut for hay (finished). Hay turned.
29-Jun-94 : B : Hay turned.
30-Jun-94 : B : Hay turned and rowed up.
01-Jul-94 : B : Hay baled.
29-Nov-94 : B : Second sample cut, herbage removed (started).
30-Nov-94 : B : Second sample cut, herbage removed (finished).
Remaining area cut, herbage removed.

NOTES: (1) Herbage samples from selected plots were taken for chemical analysis.
(2) A comparison of hay and silage yields was made on selected plots.
(3) Number and biomass of individual plant species were measured on all plots.

94/R/PG/5

1ST CUT (27/6/94) DRY MATTER TONNES/HECTARE

***** Tables of means *****

	LIME	A	B	C	D	MEAN
	MANURE					
N1	1	3.23	3.26	3.57	2.22	3.07
O(D)	2	2.82	3.84	2.44	2.22	2.83
O	3	2.90	3.39	1.95	2.17	2.60
P	4/1	3.88	4.74	3.28	3.22	3.78
N2P	4/2	4.33	3.68	4.00	2.48	3.62
N1MN	6	5.92	5.74			5.83
MN	7	5.39	5.62	5.80	4.56	5.34
PNAMG	8	3.93	4.76	3.80	3.55	4.01
MN(N2)	9/1	5.12	3.67	1.87	2.70	3.34
N2MN	9/2	6.45	6.50	5.70	6.19	6.21
N2PNAMG	10	4.92	4.24	4.15	3.13	4.11
N3MN	11/1	6.52	7.53	6.33	4.83	6.30
N3MNSI	11/2	6.57	6.56	6.60	5.73	6.36
O	12	3.09	3.04	1.88	1.95	2.49
D/F	13	4.58	5.53	5.19	5.13	5.11
MN(N2*)	14/1	5.02	4.57	4.00	3.37	4.24
N2*MN	14/2	2.82	6.66	5.31	4.88	4.92
MN(N2*)	15	4.47	5.44	5.29	4.71	4.98
N1*MN	16	5.12	5.61	4.85	4.82	5.10
N1*	17	3.85	3.56	3.19	3.04	3.41
N2KNAMG0	18/1			4.94	2.77	3.86
N2KNAMG2	18/2					4.32
N2KNAMG1	18/3	4.54	3.82			4.18
D0	19/1					5.76
D2	19/2					5.56
D1	19/3					5.99
D/N*PK0	20/1					5.63
D/N*PK2	20/2					5.82
D/N*PK1	20/3					5.48

1ST CUT MEAN DM% 28.1

94/R/PG/5

2ND CUT (30/11/94) DRY MATTER TONNES/HECTARE

***** Tables of means *****

LIME MANURE		A	B	C	D	MEAN
N1	1	2.36	1.17	0.86	0.20	1.15
O(D)	2	0.80	0.98	0.88	0.80	0.87
O	3	0.67	0.87	0.81	0.91	0.82
P	4/1	0.91	0.72	0.92	0.73	0.82
N2P	4/2	1.18	1.25	0.55	0.26	0.81
N1MN	6	0.80	0.84	.		0.82
MN	7	0.77	1.06	1.13	0.58	0.88
PNAMG	8	0.62	0.72	0.84	0.91	0.77
MN(N2)	9/1	0.56	0.55	0.19	0.02	0.33
N2MN	9/2	0.83	0.99	0.44	0.42	0.67
N2PNAMG	10	0.75	0.97	0.74	0.77	0.81
N3MN	11/1	1.17	0.86	0.82	0.55	0.85
N3MNSI	11/2	1.48	1.30	0.78	0.76	1.08
O	12	0.33	0.53	0.68	0.51	0.51
D/F	13	1.39	1.31	0.88	1.09	1.17
MN(N2*)	14/1	1.67	1.11	0.83	0.74	1.09
N2*MN	14/2	1.97	2.07	1.25	1.09	1.60
MN(N2*)	15	1.00	1.37	0.97	0.75	1.02
N1*MN	16	1.40	1.52	0.92	0.86	1.17
N1*	17	0.57	0.54	0.78	1.09	0.75
N2KNAMG0	18/1			0.67	0.18	0.42
N2KNAMG2	18/2					1.07
N2KNAMG1	18/3	0.79	0.79			0.79
D0	19/1					1.43
D2	19/2					3.29
D1	19/3					1.38
D/N*PK0	20/1					1.64
D/N*PK2	20/2					1.93
D/N*PK1	20/3					2.16

2ND CUT MEAN DM% 32.8

94/R/PG/5

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means *****

	LIME	A	B	C	D	MEAN
	MANURE					
N1	1	5.59	4.43	4.43	2.42	4.22
O(D)	2	3.62	4.83	3.32	3.02	3.70
O	3	3.57	4.26	2.76	3.08	3.42
P	4/1	4.79	5.46	4.20	3.94	4.60
N2P	4/2	5.50	4.93	4.55	2.74	4.43
N1MN	6	6.72	6.58			6.65
MN	7	6.16	6.68	6.93	5.14	6.23
PNAMG	8	4.55	5.47	4.65	4.46	4.78
MN(N2)	9/1	5.68	4.21	2.06	2.72	3.67
N2MN	9/2	7.28	7.49	6.15	6.61	6.88
N2PNAMG	10	5.68	5.21	4.89	3.91	4.92
N3MN	11/1	7.69	8.38	7.15	5.37	7.15
N3MNSI	11/2	8.04	7.86	7.38	6.49	7.44
O	12	3.41	3.58	2.56	2.46	3.00
D/F	13	5.98	6.84	6.07	6.22	6.28
MN(N2*)	14/1	6.69	5.68	4.83	4.12	5.33
N2*MN	14/2	4.79	8.73	6.56	5.97	6.51
MN(N2*)	15	5.47	6.81	6.25	5.46	6.00
N1*MN	16	6.52	7.13	5.77	5.67	6.27
N1*	17	4.42	4.09	3.97	4.14	4.15
N2KNAMG0	18/1			5.62	2.95	4.28
N2KNAMG2	18/2					5.39
N2KNAMG1	18/3	5.33	4.61			4.97
D0	19/1					7.18
D2	19/2					8.85
D1	19/3					7.38
D/N*PK0	20/1					7.28
D/N*PK2	20/2					7.75
D/N*PK1	20/3					7.64

TOTAL OF 2 CUTS MEAN DM% 30.4

PLOT AREA HARVESTED 0.00002