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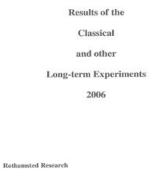
Results of the Classical and Other Long-term Experiments 2006



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06/R/PG/5

PARK GRASS

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

The 151st year, hay.

For previous years see 'Details' 1977 and 1973 and 74-05/R/PG/5.

Treatments: Combinations of:-

Whole plots

1. **Manure** — Fertilizers and organic manures:

N1	Plot 1	N1
K	Plot 2/1	K since 1996 (as 2/2 before)
None(FYM)	Plot 2/2	None (FYM until 1863)
None	Plot 3	None
P	Plot 4/1	P
N2P	Plot 4/2	N2 P
N1PKNaMg	Plot 6	N1 P K Na Mg
PKNaMg	Plot 7	P K Na Mg
PNaMg	Plot 8	P Na Mg
PKNaMg(N2)	Plot 9/1	P K Na Mg (N2 until 1989)
N2PKNaMg	Plot 9/2	N2 P K Na Mg
N2PNaMg	Plot 10	N2 P Na Mg
N3PKNaMg	Plot 11/1	N3 P K Na Mg
N3PKNaMgSi	Plot 11/2	N3 P K Na Mg Si
None	Plot 12	None
(FYM/F)	Plot 13/1	None (FYM/F until 1993/1995)
FYM/PM	Plot 13/2	FYM/PM (FYM/F until 1999)
PKNaMg(N2*)	Plot 14/1	P K Na Mg (N2* until 1989)
N2*PKNaMg	Plot 14/2	N2* P K Na Mg
PKNaMg(N2*)	Plot 15	P K Na Mg (N2* until 1875)
N1*PKNaMg	Plot 16	N1* P K Na Mg
N1*	Plot 17	N1*
N2KNaMg	Plot 18	N2 K Na Mg
FYM	Plot 19	FYM
FYM/N*PK	Plot 20	FYM/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 in years with no farmyard manure)
P:	35 kg P (15 kg P to plot 20 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 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
FYM:	Farmyard manure at 35 t every fourth year

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F: Fishmeal every fourth year to supply 63 kg N (stopped 1999; replaced by PM)

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1. **Manure** Fertilizers and organic manures(cont.)

PM Pelleted poultry manure at 2 t, every fourth year to supply 63 kg N (started 2003)

Sub-plots

2. **Lime** Liming plots 1-18 (excluding 18/2):

a Ground chalk applied as necessary to achieve pH7
b Ground chalk applied as necessary to achieve pH6
c Ground chalk applied as necessary to achieve pH5
d None

NOTE: Lime was applied regularly 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 was applied in 2003, the fourth application in a triennial scheme of soil pH analysis and remedial chalk applications.

[This note was incorrect in 97-01/R/PG/5 Yield book entries.]

Lime Liming plots 18-20:

NOTE: Differential rates of lime were applied to sub-plots 2 and 3 regularly 1920-1964. Since 1975 plot 18-1 has been split into two for treatments 'c' and 'd' as 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.

[This note was incorrect in 97-05/R/PG/5 Yield book entries.]

Experimental diary:
The amount of chalk applied in t/ha.

Plot	a	b	c
1	1.5	0.75	0.75
2/1	0.75	0.75	0.3
2/2	0	0.3	0
3	0.5	0	0
4/1	1.5	0.3	0
4/2	4.0	1.0	1.0
6	3.0	2.0	0
7	2.0	1.5	0.3
8	2.0	0.5	0
9/1	3.0	0.75	0
9/2	3.0	3.0	1.0
10	3.0	0	0.5
11/1	5.0	1.0	1.5
11/2	4.0	1.0	1.5
12	1.5	0.75	0

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13/1	1.5	0.75	0.3
13/2	2.0	0.3	0
14/1	2.0	1.5	0
14/2	2.0	0	0
15	3.0	1.5	0.3
16	3.0	0	0
17	1.5	0	0
18	4.0	1.0	1.0

21-Nov-05	T	Chalk applied
22-Nov-05	**T**	P applied.
29-Nov-05	**T**	K, Si, Na, Mg applied.
07-Feb-06	B	Rolled.
12-Apr-06	**T**	N applied (except to plots 14/2, 16 and 17).
13-Apr-06	**T**	Remaining N applied.
26-Apr-06		Cut paths.
23-May-06		Cut paths.
12-Jun-06	**T**	Cut sample areas for yield, sampled and weighed, and carted cut grass.
13-Jun-06	**T**	Finished cutting sample areas for yield, sampled and weighed. Cut discards.
14-Jun-06	B	Turned hay.
15-Jun-06	B	Turned hay.
16-Jun-06	B	Turned hay.
17-Jun-06	B	Turned hay, rowed up and baled hay.
04-Sep-06	B	Cut paths.
07-Nov-06	B	Cut paths.
13-Nov-06	**T**	Cut sample areas for yield, sampled and weighed.
14-Nov-06	T	Finished cutting sample areas for yield, sampled and weighed, cut discards and rowed up
15-Nov-06	B	Rowed up and baled.

NOTE: Samples of herbage from both cuts weres taken for chemical analysis. Unground samples of herbage from all plots from both cuts were archived.

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1ST CUT (12-13/6/06) DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	2.00	1.91	1.72	1.17	1.70
K	2/1	1.73	2.29	1.08	1.18	1.57
None(FYM)	2/2	2.37	2.36	1.15	1.28	1.79
None	3	2.22	1.95	1.18	1.21	1.64
P	4/1	2.37	2.35	1.82	1.71	2.06
N2P	4/2	2.50	2.74	2.52	1.16	2.23
N1PKNaMg	6	4.70	4.19			4.45
PKNaMg	7	3.80	3.98	3.56	2.54	3.47
PNaMg	8	2.15	2.00	2.28	2.14	2.14
PKNaMg(N2)	9/1	3.59	3.19	3.94	1.74	3.12
N2PKNaMg	9/2	4.85	4.36	4.43	3.00	4.16
N2PNaMg	10	2.71	2.81	2.86	1.43	2.45
N3PKNaMg	11/1	5.89	5.23	4.95	1.94	4.50
N3PKNaMgSi	11/2	5.73	5.36	5.83	3.62	5.14
None	12	1.37	1.77	1.32	1.32	1.45
(FYM/F)	13/1	1.96	2.37	1.83	1.95	2.03
FYM/PM	13/2	2.92	3.46	3.53	2.78	3.17
PKNaMg(N2*)	14/1	3.01	3.61	3.26	2.65	3.14
N2*PKNaMg	14/2	3.15	4.18	4.32	4.32	3.99
PKNaMg(N2*)	15	3.67	4.03	3.12	2.25	3.27
N1*PKNaMg	16	3.59	3.17	2.73	3.00	3.12
N1*	17	2.64	2.59	2.73	2.45	2.60
N2KNaMg	18	1.74	2.61	2.07	0.28	1.67
N2KNaMg	18/2					2.17
FYM	19/1					3.02
FYM	19/2					3.47
FYM	19/3					3.11
FYM/N*PK	20/1					3.63
FYM/N*PK	20/2					4.52
FYM/N*PK	20/3					3.77

1ST CUT MEAN DM% 25.9

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2ND CUT (13-14/11/06) DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	1.11	1.23	0.87	0.34	0.89
K	2/1	0.84	0.82	0.38	0.50	0.64
None(FYM)	2/2	0.91	0.95	0.62	0.72	0.80
None	3	0.86	1.07	0.68	1.14	0.94
P	4/1	1.14	1.17	1.36	1.29	1.24
N2P	4/2	1.16	1.32	0.94	0.94	1.09
N1PKNaMg	6	1.48	1.56			1.52
PKNaMg	7	1.80	2.03	1.34	0.81	1.49
PNaMg	8	0.98	1.24	1.31	1.56	1.27
PKNaMg(N2)	9/1	1.82	1.57	0.96	0.39	1.18
N2PKNaMg	9/2	1.44	1.49	1.35	2.00	1.57
N2PNaMg	10	1.19	1.59	1.55	1.90	1.56
N3PKNaMg	11/1	2.19	2.08	2.00	1.97	2.06
N3PKNaMgSi	11/2	2.56	2.07	1.87	2.52	2.26
None	12	0.93	0.78	0.69	0.79	0.80
(FYM/F)	13/1	1.90	2.10	1.46	0.88	1.59
FYM/PM	13/2	1.64	2.45	1.99	2.02	2.03
PKNaMg(N2*)	14/1	1.53	1.79	1.73	2.24	1.82
N2*PKNaMg	14/2	1.53	1.88	1.85	2.08	1.83
PKNaMg(N2*)	15	1.72	1.91	0.93	0.76	1.33
N1*PKNaMg	16	3.02	1.63	1.41	1.10	1.79
N1*	17	1.68	1.44	1.34	1.28	1.44
N2KNaMg	18	1.08	1.01	0.72	0.17	0.74
N2KNaMg	18/2					1.09
FYM	19/1					1.65
FYM	19/2					2.02
FYM	19/3					1.84
FYM/N*PK	20/1					1.80
FYM/N*PK	20/2					2.02
FYM/N*PK	20/3					1.80

2ND CUT MEAN DM% 26.9

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TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	3.11	3.14	2.60	1.51	2.59
K	2/1	2.57	3.12	1.46	1.68	2.21
None(FYM)	2/2	3.29	3.30	1.77	2.00	2.59
None	3	3.07	3.02	1.86	2.35	2.57
P	4/1	3.51	3.52	3.19	3.00	3.30
N2P	4/2	3.66	4.06	3.46	2.10	3.32
N1PKNaMg	6	6.18	5.75			5.96
PKNaMg	7	5.60	6.01	4.90	3.35	4.96
PNaMg	8	3.13	3.24	3.59	3.70	3.41
PKNaMg(N2)	9/1	5.40	4.76	4.90	2.14	4.30
N2PKNaMg	9/2	6.29	5.85	5.79	5.00	5.73
N2PNaMg	10	3.89	4.40	4.41	3.33	4.01
N3PKNaMg	11/1	8.08	7.31	6.94	3.91	6.56
N3PKNaMgSi	11/2	8.29	7.43	7.70	6.14	7.39
None	12	2.30	2.55	2.02	2.11	2.24
(FYM/F)	13/1	3.86	4.47	3.29	2.84	3.61
FYM/PM	13/2	4.57	5.91	5.52	4.80	5.20
PKNaMg(N2*)	14/1	4.55	5.40	4.99	4.89	4.96
N2*PKNaMg	14/2	4.67	6.06	6.17	6.40	5.83
PKNaMg(N2*)	15	5.39	5.93	4.05	3.02	4.60
N1*PKNaMg	16	6.61	4.80	4.13	4.10	4.91
N1*	17	4.32	4.02	4.07	3.73	4.04
N2KNaMg	18	2.81	3.62	2.79	0.45	2.42
N2KNaMg	18/2					3.26
FYM	19/1					4.67
FYM	19/2					5.49
FYM	19/3					4.95
FYM/N*PK	20/1					5.44
FYM/N*PK	20/2					6.54
FYM/N*PK	20/3					5.56

TOTAL OF 2 CUTS MEAN DM% 26.4