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Yields of the Field Experiments 2007

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R/PG/5 Park Grass

Rothamsted Research

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07/R/PG/5

PARK GRASS

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

The 152nd year, hay.

For previous years see 'Details' 1977 and 1973 and Yield Books for 74-06/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	Plot11/1	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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1. Manure Fertilizers and organic manures (cont'd)

F:	Fishmeal every fourth year to supply 63 kg N (stopped 1999; replaced by PM
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 2006; the fifth 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 97-01/R/PG/5 Yield book entries.]

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Experimental diary:

			Rate	Unit
15-Jan-07	f	Triple Superphosphate - Plots 4/1, 4/2, 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14/1, 14/2, 15, 16	171.00	kg/ha
	f	Triple Superphosphate -Plot 20	73.00	kg/ha
01-Feb-07	f	Sulphate of Potash - Plots 2/1, 6, 7, 9/1, 9/2, 11/1, 11/2, 14-16, 18	542.00	kg/ha
	f	Sulphate of Potash - Plot 20	108.00	kg/ha
	f	Anhydrous Sulphate of Soda - Plots 6-11/2, 14-16, 18	43.00	kg/ha
	f	Magnesium Sulphate - Plots 6-11/2, 14-16, 18	111.00	kg/ha
	f	Silicate of Soda - Plot 11/2	450.00	kg/ha
02-Feb-07	f	Poultry manure - Plot 13/2	2.00	t/ha
13-Mar-07	a	Rolled		
05-Apr-07	f	Nitrate of Soda - Plot 20	188.00	kg/ha
	f	Nitrate of Soda - Plots 16, 17	300.00	kg/ha
	f	Nitrate of Soda - Plot 14/2	600.00	kg/ha
	f	Sulphate of Ammonia - Plots 1, 6a, 6b	229.00	kg/ha
	f	Sulphate of Ammonia - Plots 4/2, 9/2, 10, 18	457.00	kg/ha
	f	Sulphate of Ammonia - Plots 11/1, 11/2	686.00	kg/ha
13-Apr-07	a	Mow/Rotavate paths - External paths completed 16-Apr-07		
30-Apr-07	a	Mow/Rotavate paths - completed 8-May-07		
02-Jul-07	a	Cut harvest strips, weighed and sampled - plots 11/1-13/2, 18-20.		
03-Jul-07	a	Cut harvest strips, weighed and sampled -all remaining plots		
04-Jul-07	a	Mowed		
05-Jul-07	a	Turned hay		
	a	Rowed up hay		
	a	Baled (36 bales)		
09-Jul-07	a	Topped to tidy		
	a	Row up		
10-Jul-07	a	Baled discard topped grass		
30-Jul-07	a	Mow / Rotavate paths		
05-Nov-07	a	Mow / Rotavate paths		
06-Nov-07	a	Cut harvest strips, weighed and sampled completed 7-Nov-07		
07-Nov-07	a	Mowed		
	a	Row up		
	a	Baled		
13-Mar-07	a	Chain swiped discards around trees		

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1ST CUT (2-3/7/07) DRY MATTER TONNES/HECTARES

***** Table of means *****

Grand mean 3.44

Manure	Lime	a	b	c	d	Mean
N1	1	2.69	2.39	1.22	0.54	1.71
K	2/1	1.91	2.08	0.96	1.15	1.52
None(FYM)	2/2	2.37	2.87	1.18	1.60	2.01
None	3	2.27	2.36	1.23	1.38	1.81
P	4/1	2.84	3.24	2.21	2.20	2.62
N2P	4/2	2.64	2.76	2.87	1.44	2.43
N1PKNaMg	6	5.07	4.70			4.89
PKNaMg	7	4.84	4.92	4.18	2.28	4.05
PNaMg	8	2.62	3.04	2.98	3.17	2.95
PKNaMg(N2)	9/1	4.68	4.68	3.81	0.97	3.54
N2PKNaMg	9/2	5.13	4.93	4.80	4.08	4.73
N2PNaMg	10	3.21	2.96	3.69	2.31	3.04
N3PKNaMg	11/1	5.83	6.24	5.50	4.33	5.48
N3PKNaMgSi	11/2	5.79	5.52	5.78	5.03	5.53
None	12	2.40	2.12	1.41	1.64	1.90
(FYM/F)	13/1	3.86	3.84	3.06	2.62	3.35
FYM/PM	13/2	3.92	4.55	4.01	4.21	4.17
PKNaMg(N2*)	14/1	4.68	4.79	4.09	3.47	4.26
N2*PKNaMg	14/2	3.59	4.64	4.30	4.31	4.21
PKNaMg(N2*)	15	4.32	4.85	3.30	2.12	3.65
N1*PKNaMg	16	4.28	4.11	3.69	2.96	3.76
N1*	17	2.97	3.09	2.39	2.45	2.73
N2KNaMg	18	3.96	4.22	3.81	1.81	3.45
N2KNaMg	18/2					4.31
FYM	19/1					4.63
FYM	19/2					4.81
FYM	19/3					4.23
FYM/N*PK	20/1					4.81
FYM/N*PK	20/2					5.85
FYM/N*PK	20/3					4.87

1ST CUT MEAN DM% 21.1

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2ND CUT (6-7/11/07) DRY MATTER TONNES/HECTARES

****** Table of means *****

Grand mean 1.57

Manure	Lime	a	b	c	d	Mean
N1	1	1.14	1.08	0.64	0.49	0.84
K	2/1	0.80	0.85	0.35	0.52	0.63
None(FYM)	2/2	1.13	1.25	0.70	0.72	0.95
None	3	1.12	1.19	0.70	0.89	0.98
P	4/1	1.53	1.60	1.52	1.38	1.51
N2P	4/2	1.23	1.18	1.13	0.72	1.07
N1PKNaMg	6	2.74	2.53			2.64
PKNaMg	7	2.77	2.79	2.01	1.39	2.24
PNaMg	8	1.56	1.36	1.38	1.46	1.44
PKNaMg(N2)	9/1	2.71	2.76	1.64	0.24	1.84
N2PKNaMg	9/2	1.88	1.64	1.36	2.48	1.84
N2PNaMg	10	1.43	0.97	0.85	1.35	1.15
N3PKNaMg	11/1	2.39	2.24	1.39	3.24	2.31
N3PKNaMgSi	11/2	2.85	2.40	1.83	3.36	2.61
None	12	1.32	0.85	0.29	0.64	0.77
(FYM/F)	13/1	2.41	1.66	0.61	0.46	1.29
FYM/PM	13/2	1.24	1.72	1.30	1.19	1.36
PKNaMg(N2*)	14/1	2.48	2.41	2.41	1.94	2.31
N2*PKNaMg	14/2	1.42	1.82	2.04	1.68	1.74
PKNaMg(N2*)	15	2.24	2.47	2.07	1.25	2.01
N1*PKNaMg	16	2.47	2.40	1.63	1.24	1.94
N1*	17	1.45	1.24	0.81	0.84	1.08
N2KNaMg	18	1.03	1.17	1.58	0.86	1.16
N2KNaMg	18/2					1.48
FYM	19/1					2.28
FYM	19/2					2.48
FYM	19/3					2.12
FYM/N*PK	20/1					2.05
FYM/N*PK	20/2					2.47
FYM/N*PK	20/3					1.99

2ND CUT MEAN DM% 28.11

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TOTAL OF TWO CUTS DRY MATTER TONNES/HECTARES

***** Table of means *****

Grand mean 5.01

Manure	Lime	a	b	c	d	Mean
N1	1	3.82	3.47	1.87	1.02	2.55
K	2/1	2.71	2.93	1.31	1.67	2.16
None(FYM)	2/2	3.51	4.11	1.88	2.32	2.96
None	3	3.39	3.55	1.93	2.27	2.79
P	4/1	4.36	4.83	3.73	3.58	4.13
N2P	4/2	3.87	3.93	4.01	2.16	3.49
N1PKNaMg	6	7.81	7.23			7.52
PKNaMg	7	7.61	7.72	6.19	3.67	6.30
PNaMg	8	4.17	4.40	4.35	4.63	4.39
PKNaMg(N2)	9/1	7.39	7.45	5.45	1.21	5.37
N2PKNaMg	9/2	7.01	6.57	6.16	6.56	6.58
N2PNaMg	10	4.63	3.92	4.53	3.67	4.19
N3PKNaMg	11/1	8.21	8.48	6.89	7.57	7.79
N3PKNaMgSi	11/2	8.64	7.92	7.62	8.39	8.14
None	12	3.73	2.97	1.70	2.28	2.67
(FYM/F)	13/1	6.27	5.50	3.67	3.08	4.63
FYM/PM	13/2	5.16	6.27	5.31	5.40	5.53
PKNaMg(N2*)	14/1	7.16	7.20	6.50	5.41	6.57
N2*PKNaMg	14/2	5.02	6.47	6.34	6.00	5.96
PKNaMg(N2*)	15	6.57	7.32	5.37	3.37	5.65
N1*PKNaMg	16	6.75	6.51	5.32	4.20	5.69
N1*	17	4.42	4.33	3.20	3.29	3.81
N2KNaMg	18	4.99	5.39	5.39	2.67	4.61
N2KNaMg	18/2					5.79
FYM	19/1					6.91
FYM	19/2					7.30
FYM	19/3					6.35
FYM/N*PK	20/1					6.86
FYM/N*PK	20/2					8.32
FYM/N*PK	20/3					6.86

TOTAL OF 2 CUTS MEAN DM% 24.60

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