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# Yields of the Field Experiments 2007

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Results of the  
Classical and other  
Long-term 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 152<sup>nd</sup> 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.	<b>Manure</b>	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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1<sup>ST</sup> 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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2<sup>ND</sup> 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

<b>Manure</b>	<b>Lime</b>	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