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Yields of the Field Experiments 2008

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R/PG/5 Park Grass

Rothamsted Research

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08/R/PG/5

PARK GRASS

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

The 153rd year, hay.

For previous years see 'Details' 1977 and 1973 and Yield Books for 74-07/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, fertilisers 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 2007; the sixth 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
03-Dec-07	f	Triple Superphosphate Plots 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
20-Dec-07	f	Sulphate of Potash Plots 2/1, 6, 7, 9/1, 9/2, 11/1, 11/2, 14-1/ 14/2, 15, 16, & 18	542.00	kg/ha
	f	Sulphate of potash Plot 20	108.00	kg/ha
	f	Anhydrous Sulphate of Soda Plots 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14-1/ 14/2, 15, 16, & 18	43.00	kg/ha
	f	Magnesium Sulphate Plots 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14-1/ 14/2, 15, 16, & 18	111.00	kg/ha
	f	Silicate of Soda Plot 11/2	450.00	kg/ha
03-Apr-08	f	Sulphate of Ammonia Plot 6 (a 12' 6" pass applied to C and D plots in error)	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
	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
05-Jun-08	a	Mow paths		
23-Jun-08	a	Cut harvest strips, weighed and sampled completed 24-Jun-08		
	a	Mowed completed 24-Jun-08		
25-Jun-08	a	Turned hay		
	a	Row up		
	a	Baled by contractor, 34 round bales		
26-Jun-08	a	Topped to remove straggly grass		
29-Jul-08	a	Mow / Rotavate paths		
28-Oct-08	a	Cut harvest strips (2nd cut), weighed and sampled, completed 4-Nov-08		
04-Nov-08	a	Mowed		
	a	Baled		

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1ST CUT (23-24/6/08) DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	3.23	2.78	2.40	1.96	2.59
K	2/1	2.86	2.77	1.23	1.31	2.04
None(FYM)	2/2	2.38	2.77	1.08	1.57	1.95
None	3	2.67	2.82	1.10	1.47	2.02
P	4/1	3.21	3.52	2.68	2.38	2.95
N2P	4/2	3.45	3.70	4.05	2.37	3.39
N1PKNaMg	6	6.01	5.93			5.97
PKNaMg	7	5.68	5.72	4.72	2.52	4.66
PNaMg	8	2.74	2.86	2.56	2.46	2.65
PKNaMg(N2)	9/1	5.51	5.58	4.98	0.98	4.26
N2PKNaMg	9/2	5.58	5.21	4.96	3.26	4.75
N2PNaMg	10	3.79	3.71	4.26	2.08	3.46
N3PKNaMg	11/1	6.42	5.60	5.04	3.71	5.20
N3PKNaMgSi	11/2	6.46	5.19	4.70	4.10	5.11
None	12	2.82	2.09	1.07	1.18	1.79
(FYM/F)	13/1	3.84	2.96	1.88	1.82	2.62
FYM/PM	13/2	3.19	3.19	3.26	3.17	3.20
PKNaMg(N2*)	14/1	5.40	5.43	5.62	4.85	5.33
N2*PKNaMg	14/2	7.24	5.52	5.25	5.02	5.76
PKNaMg(N2*)	15	5.59	5.97	5.06	2.75	4.84
N1*PKNaMg	16	5.67	5.80	4.77	4.55	5.20
N1*	17	3.12	3.08	2.44	2.81	2.86
N2KNaMg	18	3.17	3.68	3.22	1.77	2.96
N2KNaMg	18/2					4.08
FYM	19/1					3.58
FYM	19/2					3.83
FYM	19/3					4.41
FYM/N*PK	20/1					4.79
FYM/N*PK	20/2					4.55
FYM/N*PK	20/3					4.81

1ST CUT MEAN DM% 27.1

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2ND CUT (28/10/08 and 03/11/08) DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	1.72	1.52	1.29	0.93	1.36
K	2/1	1.60	1.41	0.89	0.88	1.19
None(FYM)	2/2	1.42	1.52	0.91	1.07	1.23
None	3	1.48	1.68	0.95	1.08	1.30
P	4/1	1.52	1.48	1.36	1.30	1.42
N2P	4/2	1.56	1.57	1.68	1.09	1.47
N1PKNaMg	6	2.90	3.16			3.03
PKNaMg	7	3.11	3.40	3.20	1.83	2.89
PNaMg	8	2.25	2.14	2.13	2.02	2.14
PKNaMg(N2)	9/1	3.30	3.48	3.11	0.50	2.60
N2PKNaMg	9/2	2.34	2.63	2.26	2.53	2.44
N2PNaMg	10	1.58	1.41	2.37	1.69	1.76
N3PKNaMg	11/1	2.78	2.65	2.76	3.05	2.81
N3PKNaMgSi	11/2	3.27	3.27	2.89	3.55	3.24
None	12	1.79	1.50	0.83	0.84	1.24
(FYM/F)	13/1	2.28	2.67	1.58	1.08	1.90
FYM/PM	13/2	2.50	3.02	2.78	2.59	2.72
PKNaMg(N2*)	14/1	1.99	2.54	2.49	2.12	2.29
N2*PKNaMg	14/2	1.83	2.40	2.27	2.04	2.13
PKNaMg(N2*)	15	2.54	2.35	2.51	1.32	2.18
N1*PKNaMg	16	2.77	2.87	2.38	2.05	2.52
N1*	17	2.19	2.02	1.53	1.33	1.77
N2KNaMg	18	1.66	1.86	2.59	0.97	1.77
N2KNaMg	18/2					2.16
FYM	19/1					2.97
FYM	19/2					3.27
FYM	19/3					3.16
FYM/N*PK	20/1					3.56
FYM/N*PK	20/2					3.60
FYM/N*PK	20/3					2.97

2ND CUT MEAN DM% 20.50

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TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	4.95	4.30	3.68	2.89	3.96
K	2/1	4.46	4.18	2.12	2.19	3.24
None(FYM)	2/2	3.80	4.29	1.98	2.64	3.18
None	3	4.16	4.50	2.06	2.55	3.32
P	4/1	4.73	5.00	4.04	3.68	4.36
N2P	4/2	5.00	5.26	5.73	3.46	4.86
N1PKNaMg	6	8.91	9.09			9.00
PKNaMg	7	8.78	9.12	7.93	4.35	7.54
PNaMg	8	4.99	5.01	4.69	4.48	4.79
PKNaMg(N2)	9/1	8.81	9.05	8.09	1.48	6.86
N2PKNaMg	9/2	7.91	7.84	7.22	5.79	7.19
N2PNaMg	10	5.37	5.12	6.63	3.77	5.22
N3PKNaMg	11/1	9.20	8.25	7.80	6.77	8.01
N3PKNaMgSi	11/2	9.73	8.46	7.59	7.65	8.36
None	12	4.61	3.58	1.90	2.01	3.02
(FYM/F)	13/1	6.12	5.63	3.46	2.90	4.53
FYM/PM	13/2	5.69	6.21	6.03	5.76	5.92
PKNaMg(N2*)	14/1	7.39	7.98	8.11	6.97	7.61
N2*PKNaMg	14/2	9.07	7.92	7.52	7.06	7.89
PKNaMg(N2*)	15	8.13	8.33	7.57	4.07	7.02
N1*PKNaMg	16	8.44	8.67	7.15	6.60	7.72
N1*	17	5.31	5.11	3.97	4.13	4.63
N2KNaMg	18	4.83	5.54	5.81	2.74	4.73
N2KNaMg	18/2					6.24
FYM	19/1					6.55
FYM	19/2					7.10
FYM	19/3					7.57
FYM/N*PK	20/1					8.34
FYM/N*PK	20/2					8.15
FYM/N*PK	20/3					7.78

TOTAL OF 2 CUTS MEAN DM% 23.80

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