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Yields of the Field Experiments 2009

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R/PG/5 Park Grass

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PARK GRASS

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

The 154th year, hay.

For previous years see 'Details' 1977 and 1973 and Yield Books for 74-08/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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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
02-Dec-08	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 and 16	171.00	kg/ha
08-Dec-08	f	Sulphate of Potash - Plots 2/1 ,6, 7, 9/1, 9/2, 11/1, 11/2, 14/1, 14/2, 15, 16 and 18, completed 09-Dec-08	542.00	kg/ha
	f	Sodium Sulphate - plots 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14/1, 14/2, 15, 16 and 18, completed 09-Dec-08	43.00	kg/ha
	f	Manganese Sulphate - plots 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14/1, 14/2, 15, 16 and 18, completed 09/12/08	111.00	kg/ha
	f	Silicate of Soda- plot 11-2, completed 09-Dec-08	450.00	kg/ha
11-Dec-08	f	Chalk - plot 13/2a	2.00	t/ha
	f	Chalk - plot 13/2b	0.50	t/ha
	f	Farm Yard Manure - plots 13/2, 19 and 20	35.00	t/ha
	a	Mow paths		
14-Jan-09	f	Chalk plots - 13/1a, 12a, 11/1c, 9/2b, 9/2c and 9/1a	2.00	t/ha
	f	Chalk plots - 13/1b, 12b, 9/1c, 7b, 4/2b and 4/2c	1.00	t/ha
	f	Chalk plots - 13/1c, 12c and 8c	0.30	t/ha
	f	Chalk plots - 11/2b, 11/2c, 11/1b and 10b	1.50	t/ha
	f	Chalk plots - 11/2a, 9/2a, 8a, 7a and 6b	3.00	t/ha
	f	Chalk - plot 11/1a	5.00	t/ha
	f	Chalk - plots 10a, 6a and 4/2a	4.00	t/ha
	f	Chalk - plot 9/1b	0.75	t/ha
	f	Chalk - plots 8b and 7c	0.50	t/ha
20-Jan-09	f	Chalk - plots 2/2c, 4/1b, 15c and 18c	0.30	t/ha
	f	Chalk - plots 1b and 1c	0.75	t/ha
	f	Chalk - plots 2/1c, 2/2b, 3a, 3b and 3c,	0.50	t/ha
	f	Chalk - plots 2/1a, 2/1b and 15b	1.00	t/ha
	f	Chalk - plots 1a and 18/b	1.50	t/ha
	f	Chalk - plots 4/1a, 14/1a, 14/2a and 17a	2.00	t/ha
	f	Chalk - plots 15a and 16a	3.00	t/ha
	f	Chalk - plot 18a	4.00	t/ha
29-Apr-09	f	Ammonium Sulphate Plots 1, 6a and b)	229.00	kg/ha
	f	Ammonium Sulphate Plots 4/2, 9/2, 10 18	457.00	kg/ha
	f	Ammonium Sulphate Plots 11/1, 11/2	686.00	kg/ha
30-Apr-09	f	Nitrate of Soda - Plots 16, 17	300.00	kg/ha
	f	Nitrate of Soda - Plot 14/2	600.00	kg/ha
19-May-09	a	Cut paths		
15-Jun-09	a	Mow paths		
17-Jun-09	a	Cut harvest strips, weighed and sampled		
18-Jun-09	a	Cut harvest strips, weighed and sampled		
	a	Mown discards		
19-Jun-09	a	Turned hay		
21-Jun-09	a	Turned hay		

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22-Jun-09	a	Turned hay
	a	Row up, baled and removed
09-Jul-09	a	Mow 1m path along fence
28-Jul-09	a	Put wooden marker posts in place
	a	Mow paths
09-Nov-09	a	Cut harvest strips, weighed and sampled - Started
10-Nov-09	a	Cut harvest strips, weighed and sampled - Finished
11-Nov-09	a	Mown, baled and bales removed
23-Dec-09	a	Fixed outer fence

1ST CUT (17-18/6/09) DRY MATTER TONNES/HECTARE

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

Grand mean 3.24

Lime Manure	a	b	c	d	Mean
N1 1	2.36	1.41	0.90	0.66	1.33
K 2/1	1.80	2.98	0.79	0.56	1.53
None (FYM) 2/2	2.31	2.07	0.89	0.95	1.56
None 3	2.29	2.33	0.82	0.88	1.58
P 4/1	3.02	3.19	1.65	1.64	2.38
N2P 4/2	1.84	2.11	2.05	1.42	1.86
N1PKNaMg 6	5.04	5.48			5.26
PKNaMg 7	5.27	5.73	5.13	3.18	4.83
PNaMg 8	2.53	2.51	2.25	2.12	2.35
PKNaMg (N2) 9/1	5.28	5.54	4.65	1.34	4.20
N2PKNaMg 9/2	5.37	5.49	4.20	3.26	4.58
N2PNaMg 10	2.49	2.65	3.58	1.65	2.59
N3PKNaMg 11/1	5.44	5.18	5.05	3.52	4.80
N3PKNaMgSi 11/2	4.75	5.17	4.79	3.34	4.51
None 12	1.97	2.03	0.85	1.14	1.50
(FYM/F) 13/1	3.10	3.29	2.25	2.13	2.69
FYM/PM 13/2	3.71	4.66	3.85	3.24	3.86
PKNaMg (N2*) 14/1	4.53	5.06	4.26	4.22	4.52
N2*PKNaMg 14/2	4.62	4.64	4.14	3.85	4.31
PKNaMg (N2*) 15	4.96	5.40	4.52	2.21	4.27
N1*PKNaMg 16	5.26	5.69	3.77	3.39	4.53
N1* 17	2.03	2.01	1.71	1.92	1.92
N2KNaMg 18	2.04	2.81	2.53	1.57	2.24
N2KNaMg 18/2					2.96
FYM 19/1					4.21
FYM 19/2					5.47
FYM 19/3					5.27
FYM/N*PK 20/1					4.77
FYM/N*PK 20/2					5.00
FYM/N*PK 20/3					5.55

1ST CUT MEAN DM% 28.1

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2ND CUT (09 – 10/11/08) DRY MATTER TONNES/HECTARE

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

Grand mean 1.13

Lime	a	b	c	d	Mean
Manure					
N1 1	0.95	0.84	0.52	0.20	0.63
K 2/1	0.57	0.64	0.35	0.30	0.47
None (FYM) 2/2	0.61	0.58	0.42	0.39	0.50
None 3	0.64	0.77	0.39	0.44	0.56
P 4/1	0.97	0.72	0.54	0.48	0.68
N2P 4/2	0.86	0.98	0.76	0.72	0.83
N1PKNaMg 6	1.31	1.60			1.45
PKNaMg 7	1.44	1.83	1.50	0.96	1.44
PNaMg 8	1.19	1.09	0.80	0.77	0.96
PKNaMg (N2) 9/1	1.78	1.80	1.41	0.39	1.34
N2PKNaMg 9/2	1.47	1.49	1.06	1.81	1.46
N2PNaMg 10	0.94	0.92	1.00	1.20	1.01
N3PKNaMg 11/1	1.13	1.18	0.84	2.20	1.34
N3PKNaMgSi 11/2	1.42	1.33	1.02	1.89	1.42
None 12	1.04	0.85	0.54	0.57	0.75
(FYM/F) 13/1	2.42	1.91	1.57	0.76	1.67
FYM/PM 13/2	2.81	3.07	2.21	1.74	2.46
PKNaMg (N2*) 14/1	1.51	1.58	1.15	1.03	1.32
N2*PKNaMg 14/2	1.39	1.45	1.23	1.21	1.32
PKNaMg (N2*) 15	1.36	1.55	1.04	0.33	1.07
N1*PKNaMg 16	1.66	1.86	0.86	0.65	1.26
N1* 17	0.63	0.67	0.43	0.72	0.61
N2KNaMg 18	0.68	0.80	0.94	0.45	0.72
N2KNaMg 18/2					1.12
FYM 19/1					1.74
FYM 19/2					2.04
FYM 19/3					1.91
FYM/N*PK 20/1					1.65
FYM/N*PK 20/2					1.83
FYM/N*PK 20/3					1.78

2ND CUT MEAN DM% 28.52

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TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

Grand mean 4.37

Lime Manure	a	b	c	d	Mean
N1 1	3.30	2.25	1.42	0.86	1.96
K 2/1	2.37	3.62	1.14	0.86	2.00
None (FYM) 2/2	2.92	2.65	1.31	1.34	2.05
None 3	2.93	3.10	1.21	1.32	2.14
P 4/1	4.00	3.92	2.19	2.12	3.06
N2P 4/2	2.70	3.09	2.82	2.15	2.69
N1PKNaMg 6	6.35	7.07			6.71
PKNaMg 7	6.71	7.56	6.64	4.15	6.26
PNaMg 8	3.72	3.59	3.06	2.89	3.31
PKNaMg (N2) 9/1	7.06	7.34	6.05	1.73	5.54
N2PKNaMg 9/2	6.84	6.99	5.26	5.07	6.04
N2PNaMg 10	3.42	3.57	4.58	2.85	3.60
N3PKNaMg 11/1	6.57	6.36	5.88	5.72	6.13
N3PKNaMgSi 11/2	6.17	6.50	5.82	5.24	5.93
None 12	3.01	2.88	1.39	1.70	2.25
(FYM/F) 13/1	5.53	5.20	3.82	2.89	4.36
FYM/PM 13/2	6.52	7.73	6.05	4.98	6.32
PKNaMg (N2*) 14/1	6.05	6.64	5.41	5.24	5.83
N2*PKNaMg 14/2	6.01	6.09	5.37	5.05	5.63
PKNaMg (N2*) 15	6.32	6.96	5.56	2.55	5.35
N1*PKNaMg 16	6.92	7.55	4.63	4.04	5.78
N1* 17	2.66	2.68	2.14	2.65	2.53
N2KNaMg 18	2.72	3.61	3.47	2.02	2.95
N2KNaMg 18/2					4.08
FYM 19/1					5.96
FYM 19/2					7.50
FYM 19/3					7.18
FYM/N*PK 20/1					6.43
FYM/N*PK 20/2					6.83
FYM/N*PK 20/3					7.33

TOTAL OF 2 CUTS MEAN DM% 28.31