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# Yields of the Field Experiments 2009

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Results of the  
Classical and other  
Long-term Experiments  
2009

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## R/PG/5 Park Grass

### Rothamsted Research

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09/R/PG/5

PARK GRASS

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

The 154<sup>th</sup> 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.	<b>Manure</b>	Fertilizers and organic manures:
	N1	Plot 1
	K	Plot 2/1
	None (FYM)	Plot 2/2
	None	Plot 3
	P	Plot 4/1
	N2P	Plot 4/2
	N1PKNaMg	Plot 6
	PKNaMg	Plot 7
	PNaMg	Plot 8
	PKNaMg(N2)	Plot 9/1
	N2PKNaMg	Plot 9/2
	N2PNaMg	Plot 10
	N3PKNaMg	Plot 11/1
	N3PKNaMgSi	Plot 11/2
	None	Plot 12
	(FYM/F)	Plot 13/1
	FYM/PM	Plot 13/2
	PKNaMg (N2*)	Plot 14/1
	N2*PKNaMg	Plot 14/2
	PKNaMg (N2*)	Plot 15
	N1*PKNaMg	Plot 16
	N1*	Plot 17
	N2KNaMg	Plot 18
	FYM	Plot 19
	FYM/N*PK	Plot 20
	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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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		

**1<sup>ST</sup> CUT (17-18/6/09) DRY MATTER TONNES/HECTARE**

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

Grand mean 3.24

	Lime	a	b	c	d	Mean
	Manure					
	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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2<sup>ND</sup> 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	a	b	c	d	Mean
	Manure					
	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