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Yields of the Field Experiments 2010

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Results of the
Classical and other
Long-term Experiments

2010

R/PG/5 Park Grass

Rothamsted Research

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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 155th year, hay.

For previous years see 'Details' 1977 and 1973 and Yield Books for 74-09/R/PG/5.

Treatments: Combinations of:-

Whole plots

1.	Manure	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
04-Jan-10	a	Cut back scrub and trees along North headland		
01-Feb-10	f	TSP - 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	TSP - Plots 20-1, 20-2, 20-3	73.00	kg/ha
15-Feb-10	f	Potassium Sulphate - Plots 6,7,9-1,9-2,11-1,14-1,14-2,15,16,18 and 20	542.00	kg/ha
	f	Sodium Sulphate - Plots 6,7,9-1,9-2,11-1,14-1,14-2,15,16 and 18	43.00	kg/ha
	f	Magnesium Sulphate - Plots 6,7,9-1,9-2,11-1,14-1,14-2,15,16 and 18	111.00	kg/ha
	a	Spread fertiliser - Plots 6,7,9-1,9-2,11-1,14-1,14-2,15,16,18 and 20		
16-Feb-10	f	Potassium Sulphate - Plot 11-2	542.00	kg/ha
	f	Sodium Sulphate - Plot 11-2	43.00	kg/ha
	f	Magnesium Sulphate - Plot 11-2	111.00	kg/ha
	f	Silicate of soda - Plot 11-2	450.00	kg/ha
	a	Spread fertiliser		
18-Feb-10	f	Sodium Sulphate - Plot 10	43.00	kg/ha
	f	Magnesium Sulphate - Plot 10	111.00	kg/ha
	a	Spread fertiliser		
19-Feb-10	f	Potassium Sulphate - plot 11-2	542.00	kg/ha
	a	Spread fertiliser		
20-Feb-10	f	Sodium Sulphate - plot 11-2	43.00	kg/ha
	f	Magnesium Sulphate	111.00	kg/ha
	a	Spread fertiliser		
22-Mar-10	f	Sulphate of Ammonia - Treatments indicated on plan		
	a	Cleared branches		
24-Mar-10	f	Nitrate of Soda - Treatments indicated on plan		
16-Apr-10	a	Cut paths - Started		
20-Apr-10	a	Cut paths		
05-May-10	a	Cut surrounds		
06-May-10	a	Mow / Rotavate paths		
13-May-10	a	Mow / Rotavate paths		
14-May-10	a	Mow / Rotavate paths		
07-Jun-10	a	Cut paths		
09-Jun-10	a	Cut paths - Finished		
21-Jun-10	a	Cut harvest strips, weighed and sampled		
21-Jun-10	a	Cut o+es - Started		
22-Jun-10	a	Cut harvest strips, weighed and sampled, finished		
22-Jun-10	a	Cut o+es - Finished		
	a	Turned grass		
23-Jun-10	a	Turned grass		

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23-Jun-10	a	Contractor baled grass
24-Jun-10	a	Rowed up grass - Second time to tidy up bits left by contractor
25-Jun-10	a	Baled left over grass
12-Aug-10	a	Mow paths
28-Oct-10	a	Mown - internal paths
29-Oct-10	a	Mown - internal paths
01-Nov-10	a	Mown - internal paths
02-Nov-10	a	Cut harvest strips, weighed and sampled
03-Nov-10	a	Mown
	a	Baled - removed bales

1ST CUT (21-22/6/10) DRY MATTER TONNES/HECTARE

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

Grand mean 3.50

	Manure	Lime	a	b	c	d	Mean
N1	1		2.23	1.98	1.40	0.50	1.53
K	2/1		1.93	2.37	0.75	0.66	1.42
None (FYM)	2/2		1.72	2.06	1.12	0.90	1.45
None	3		1.85	2.41	0.85	1.07	1.55
P	4/1		3.21	3.31	2.33	2.33	2.79
N2P	4/2		2.83	2.92	3.23	1.78	2.69
N1PKNaMg	6		5.59	6.44			6.02
PKNaMg	7		5.12	5.32	5.20	2.64	4.57
PNaMg	8		2.76	3.22	2.65	2.58	2.80
PKNaMg (N2)	9/1		4.66	5.29	3.99	0.84	3.69
N2PKNaMg	9/2		5.63	5.63	4.54	2.92	4.69
N2PNaMg	10		2.95	3.04	3.53	1.89	2.85
N3PKNaMg	11/1		7.22	5.92	5.85	3.98	5.74
N3PKNaMgSi	11/2		6.45	6.49	6.11	4.25	5.82
None	12		1.94	1.87	0.84	0.94	1.40
(FYM/F)	13/1		3.03	3.39	2.33	1.65	2.60
FYM/PM	13/2		4.00	4.82	3.75	2.79	3.84
PKNaMg (N2*)	14/1		5.40	5.87	5.97	5.18	5.60
N2*PKNaMg	14/2		4.99	5.08	4.95	4.30	4.83
PKNaMg (N2*)	15		5.22	5.39	5.59	1.90	4.53
N1*PKNaMg	16		5.56	6.22	4.75	3.30	4.96
N1*	17		1.97	2.09	1.90	2.06	2.00
N2KNaMg	18		2.22	2.52	2.75	0.35	1.96
N2KNaMg	18/2						3.11
FYM	19/1						4.26
FYM	19/2						5.78
FYM	19/3						5.33
FYM/N*PK	20/1						6.05
FYM/N*PK	20/2						5.12
FYM/N*PK	20/3						6.02

1ST CUT MEAN DM% 29.5

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2ND CUT (02/11/10) DRY MATTER TONNES/HECTARE

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

Grand Mean 1.29

	Manure	Lime	a	b	c	d	Mean
N1	1		0.72	1.01	0.83	0.23	0.70
K	2/1		0.53	0.76	0.06	0.27	0.40
None (FYM)	2/2		0.45	0.74	0.34	0.34	0.47
None	3		0.42	0.71	0.22	0.50	0.46
P	4/1		0.86	0.94	0.90	1.05	0.94
N2P	4/2		0.95	1.31	1.01	0.80	1.02
N1PKNaMg	6		1.22	1.95			1.59
PKNaMg	7		1.64	1.84	1.97	0.97	1.60
PNaMg	8		1.04	1.27	1.17	1.47	1.24
PKNaMg (N2)	9/1		1.80	1.62	1.18	0.32	1.23
N2PKNaMg	9/2		1.67	1.70	1.11	1.36	1.46
N2PNaMg	10		0.67	0.98	1.04	0.76	0.86
N3PKNaMg	11/1		2.03	1.63	1.35	2.07	1.77
N3PKNaMgSi	11/2		1.81	2.04	1.75	2.76	2.09
None	12		1.04	0.80	0.46	0.55	0.71
(FYM/F)	13/1		1.79	1.97	1.24	0.64	1.41
FYM/PM	13/2		1.72	3.46	1.82	1.37	2.09
PKNaMg (N2*)	14/1		1.82	1.92	2.27	2.16	2.04
N2*PKNaMg	14/2		1.63	1.62	1.91	1.86	1.75
PKNaMg (N2*)	15		1.45	1.83	2.02	0.91	1.55
N1*PKNaMg	16		1.76	2.24	1.82	1.35	1.79
N1*	17		0.99	1.01	0.79	1.10	0.97
N2KNaMg	18		0.84	0.85	0.95	0.23	0.72
N2KNaMg	18/2						1.19
FYM	19/1						1.73
FYM	19/2						2.31
FYM	19/3						2.05
FYM/N*PK	20/1						2.71
FYM/N*PK	20/2						2.13
FYM/N*PK	20/3						1.99

2ND CUT MEAN DM% 21.07

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TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

Grand Mean 4.80

	Manure	Lime	a	b	c	d	Mean
N1	1		2.95	2.99	2.23	0.73	2.23
K	2/1		2.46	3.12	0.81	0.92	1.83
None (FYM)	2/2		2.17	2.79	1.46	1.24	1.91
None	3		2.27	3.12	1.08	1.52	2.01
P	4/1		4.07	4.25	3.23	3.38	3.73
N2P	4/2		3.79	4.23	4.24	2.58	3.71
N1PKNaMg	6		6.82	8.40			7.61
PKNaMg	7		6.75	7.16	7.17	3.61	6.17
PNaMg	8		3.80	4.49	3.82	4.05	4.04
PKNaMg (N2)	9/1		6.46	6.91	5.16	1.17	4.92
N2PKNaMg	9/2		7.30	7.33	5.65	4.28	6.14
N2PNaMg	10		3.62	4.02	4.57	2.65	3.71
N3PKNaMg	11/1		9.25	7.55	7.20	6.05	7.51
N3PKNaMgSi	11/2		8.25	8.52	7.86	7.01	7.91
None	12		2.98	2.67	1.30	1.49	2.11
(FYM/F)	13/1		4.81	5.37	3.57	2.30	4.01
FYM/PM	13/2		5.72	8.28	5.57	4.16	5.93
PKNaMg (N2*)	14/1		7.23	7.79	8.23	7.34	7.65
N2*PKNaMg	14/2		6.62	6.70	6.86	6.16	6.59
PKNaMg (N2*)	15		6.68	7.21	7.61	2.81	6.08
N1*PKNaMg	16		7.31	8.46	6.57	4.65	6.75
N1*	17		2.95	3.09	2.69	3.16	2.98
N2KNaMg	18		3.06	3.38	3.70	0.58	2.68
N2KNaMg	18/2						4.30
FYM	19/1						5.99
FYM	19/2						8.09
FYM	19/3						7.38
FYM/N*PK	20/1						8.77
FYM/N*PK	20/2						7.25
FYM/N*PK	20/3						8.01

TOTAL OF 2 CUTS MEAN DM% 25.27