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Yields of the Field Experiments 1999

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99/R/PG/5 Park Grass - Hay

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99/R/PG/5

PARK GRASS

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

The 144th year, hay.

For previous years see 'Details' 1977 and 1973 and 74-98/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) |
| O(D) | Plot 2/2 | None (D until 1863) |
| O | Plot 3 | None |
| P | Plot 4/1 | P |
| N2P | Plot 4/2 | N2 P |
| N1MN | Plot 6 | N1 P K Na Mg |
| MN | Plot 7 | P K Na Mg |
| PNAMG | Plot 8 | P Na Mg |
| MN(N2) | Plot 9/1 | P K Na Mg (N2 until 1989) |
| N2MN | Plot 9/2 | N2 P K Na Mg |
| N2PNAMG | Plot 10 | N2 P Na Mg |
| N3MN | Plot 11/1 | N3 P K Na Mg |
| N3MNSI | Plot 11/2 | N3 P K Na Mg Si |
| O | Plot 12 | None |
| (D/F) | Plot 13/1 | None (D/F until 1994) |
| D/F | Plot 13/2 | D/F |
| MN(N2*) | Plot 14/1 | P K Na Mg (N2* until 1989) |
| N2*MN | Plot 14/2 | N2* P K Na Mg |
| MN(N2*) | Plot 15 | P K Na Mg (N2* until 1875) |
| N1*MN | Plot 16 | N1* P K Na Mg |
| N1* | Plot 17 | N1* |
| N2KNAMG | Plot 18 | N2 K Na Mg |
| D | Plot 19 | D |
| D/N*PK | Plot 20 | D/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, only in years with no farmyard manure) |
| P: | 35 kg P (15 kg P to plot 20, only 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, only 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 |
| D: | Farmyard manure at 35 t every fourth year |
| F: | Fishmeal every fourth year to supply 63 kg N |
| MN: | P K Na Mg as above |

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2ND CUT (14/10/99) DRY MATTER TONNES/HECTARE

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

| | LIME | A | B | C | D | MEAN |
|----------|---------------|------|------|------|------|------|
| | MANURE | | | | | |
| N1 | 1 | 1.73 | 1.81 | 1.28 | 0.10 | 1.23 |
| K | 2/1 | 1.82 | 2.03 | 1.57 | 1.17 | 1.65 |
| O(D) | 2/2 | 1.67 | 2.04 | 1.42 | 1.34 | 1.62 |
| O | 3 | 1.65 | 1.55 | 1.40 | 1.57 | 1.54 |
| P | 4/1 | 1.43 | 1.47 | 1.73 | 1.61 | 1.56 |
| N2P | 4/2 | 1.16 | 1.27 | 0.99 | 0.34 | 0.94 |
| N1MN | 6 | 2.67 | 2.31 | | | 2.49 |
| MN | 7 | 2.37 | 2.86 | 2.73 | 1.70 | 2.41 |
| PNAMG | 8 | 1.43 | 1.69 | 1.74 | 1.46 | 1.58 |
| MN(N2) | 9/1 | 2.00 | 2.21 | 1.37 | 0.42 | 1.50 |
| N2MN | 9/2 | 2.19 | 2.56 | 2.01 | 1.33 | 2.02 |
| N2PNAMG | 10 | 2.00 | 2.23 | 2.12 | 0.94 | 1.82 |
| N3MN | 11/1 | 2.44 | 2.66 | 2.42 | 2.28 | 2.45 |
| N3MNSI | 11/2 | 2.61 | 2.64 | 2.16 | 2.51 | 2.48 |
| O | 12 | 1.31 | 1.17 | 1.40 | 1.25 | 1.28 |
| (D/F) | 13/1 | 1.62 | 1.99 | 1.79 | 1.66 | 1.76 |
| D/F | 13/2 | 1.84 | 2.41 | 2.56 | 2.21 | 2.25 |
| MN(N2*) | 14/1 | 2.30 | 2.36 | 2.30 | 2.11 | 2.27 |
| N2*MN | 14/2 | 1.79 | 1.77 | 1.43 | 1.45 | 1.61 |
| MN(N2*) | 15 | 2.75 | 2.41 | 2.04 | 1.06 | 2.07 |
| N1*MN | 16 | 2.46 | 2.11 | 1.99 | 1.63 | 2.05 |
| N1* | 17 | 1.87 | 1.96 | 1.54 | 1.36 | 1.68 |
| N2KNAMG0 | 18/1 | | | 1.29 | 0.10 | 0.69 |
| N2KNAMG2 | 18/2 | | | | | 1.87 |
| N2KNAMG1 | 18/3 | 1.67 | 1.80 | | | 1.73 |
| D0 | 19/1 | | | | | 2.57 |
| D2 | 19/2 | | | | | 2.24 |
| D1 | 19/3 | | | | | 2.27 |
| D/N*PK0 | 20/1 | | | | | 2.33 |
| D/N*PK2 | 20/2 | | | | | 3.00 |
| D/N*PK1 | 20/3 | | | | | 2.26 |

2ND CUT MEAN DM% 26.3

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TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

| LIME MANURE | A | B | C | D | MEAN |
|----------------|------|------|------|------|------|
| N1 1 | 5.42 | 5.28 | 3.71 | 1.48 | 3.97 |
| K 2/1 | 5.27 | 6.07 | 3.43 | 3.23 | 4.50 |
| O(D) 2/2 | 4.79 | 5.50 | 3.03 | 2.91 | 4.06 |
| O 3 | 4.65 | 4.71 | 3.15 | 3.51 | 4.01 |
| P 4/1 | 4.65 | 5.21 | 4.85 | 4.73 | 4.86 |
| N2P 4/2 | 3.49 | 4.09 | 3.82 | 2.85 | 3.57 |
| N1MN 6 | 8.76 | 8.28 | | | 8.52 |
| MN 7 | 8.30 | 8.45 | 9.09 | 5.96 | 7.95 |
| PNAMG 8 | 4.30 | 5.29 | 4.68 | 4.72 | 4.75 |
| MN(N2) 9/1 | 6.94 | 8.00 | 6.33 | 3.69 | 6.24 |
| N2MN 9/2 | 8.33 | 7.94 | 8.43 | 6.74 | 7.86 |
| N2PNAMG 10 | 5.57 | 5.98 | 6.48 | 4.79 | 5.70 |
| N3MN 11/1 | 8.06 | 8.66 | 7.80 | 7.29 | 7.95 |
| N3MNSI 11/2 | 8.24 | 8.24 | 6.72 | 8.17 | 7.84 |
| O 12 | 4.00 | 3.61 | 3.89 | 3.65 | 3.79 |
| (D/F) 13/1 | 4.67 | 6.28 | 6.02 | 6.23 | 5.80 |
| D/F 13/2 | 6.30 | 7.70 | 7.65 | 7.28 | 7.23 |
| MN(N2*) 14/1 | 7.26 | 7.00 | 7.34 | 6.95 | 7.14 |
| N2*MN 14/2 | 7.35 | 6.33 | 5.45 | 5.08 | 6.05 |
| MN(N2*) 15 | 8.59 | 7.93 | 7.23 | 4.36 | 7.03 |
| N1*MN 16 | 8.43 | 7.24 | 6.84 | 5.94 | 7.11 |
| N1* 17 | 5.58 | 5.74 | 4.47 | 4.54 | 5.08 |
| N2KNAMG0 18/1 | | | 6.73 | 1.43 | 4.08 |
| N2KNAMG2 18/2 | | | | | 6.38 |
| N2KNAMG1 18/3 | 5.00 | 6.16 | | | 5.58 |
| D0 19/1 | | | | | 8.02 |
| D2 19/2 | | | | | 7.53 |
| D1 19/3 | | | | | 7.31 |
| D/N*PK0 20/1 | | | | | 7.72 |
| D/N*PK2 20/2 | | | | | 8.58 |
| D/N*PK1 20/3 | | | | | 7.94 |

TOTAL OF 2 CUTS MEAN DM% 27.9

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Sub-plots

| | |
|----------------|--------------------------------------------------|
| 2. LIME | Liming plots 1-17: |
| 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 1975 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 last applied in 1997, the second application in a triennial scheme of soil pH analysis and remedial chalk applications.

Liming plots 18-20:

NOTE: Differential rates of lime were applied to sub-plots 2 and 3 regularly 1920-1974. Since 1975 plot 18-1 has been split into two for treatments 'C' and 'D' above and plot 18-3 split into two for treatments 'A' and 'B'. Plots 19 and 20 received no further chalk after 1978; plot 18/2 no further chalk after 1972.

Experimental diary:

26-Feb-99 : B : Rolled.
17-Mar-99 : T : Fishmeal, K, Mg, Na and Si applied.
18-Mar-99 : T : P applied (except plot 20).
19-Mar-99 : T : P to plot 20 only.
02-May-99 : T : N applied.
05-Jul-99 : B : Cut.
07-Jul-99 : B : Hay turned.
08-Jul-99 : B : Hay turned.
09-Jul-99 : B : Hay turned.
12-Jul-99 : B : Hay baled.
14-Oct-99 : B : Cut, herbage removed.