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Yields of the Field Experiments 1975

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75/ R/4158 - Rates & Forms of N - Old Grass

Rothamsted Research

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75/R/CS/158

RATES AND FORMS OF N

Object: To study the cumulative effects of autumn injection of liquid fertilisers at different rates and spacings on nitrification losses and the yield of old grass - Bones Close.

Sponsors: F.V. Widdowson, J. Ashworth, A. Penny.

The second year, old grass.

For previous year see 74/R/G/1.

Design: 4 randomised blocks of 20 plots.

Whole plot dimensions: 2.44 x 15.2.

Treatments (All cumulative on 1974): All combinations of:-

1. Forms of liquid nitrogen fertiliser:	N FORM L
Aqueous ammonia 25% N	LIQUID AA
Aqueous urea 18% N	LIQUID AU
2. Spacing between injection tines (cm):	SPACING
30	30
60	60
3. Total nitrogen fertiliser applied per annum (kg N):	TOTALN L
250	250
375	375
500	500
plus all combinations of:	
4. Forms of solid nitrogen fertiliser:	N FORM S
'Nitro-Chalk' 25% N	SOLID NC
Prilled urea 46% N	SOLID U
5. Total nitrogen fertiliser applied per annum (kg N):	TOTALN S
250	250
375	375
500	500
	EXTRA
plus two extra plots per block, untreated.	NONE

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NOTE: Aqueous nitrogen fertilisers were applied in one dressing on 15 Jan, 1975. Solid nitrogen was divided equally and applied on 17 Mar, 17 June, 8 Sept.

Basal applications: Manures: (0:14:28) at 500 kg.

Cultivations, etc.: - PK applied: 16 Jan, 1975. Cut: 9 June, 2 Sept, 3 Nov.

NOTES: (1) N determinations were made on the samples from each cut.
(2) Urea hydrolysis and ammonia nitrification were measured in injected soil profiles.

75/R/CS/153

GRASS

1ST CUT (9/6/75) DRY MATTER TONNES/HECTARE

*** TABLES OF MEANS ***

SPACING	30	60	MEAN	
N FORM L				
LIQUIDAA	8.12	7.75	7.93	
LIQUIDAU	8.09	7.89	7.99	
MEAN	8.11	7.82	7.96	
TOTALN L	250	375	500	MEAN
N FORM L				
LIQUIDAA	8.25	7.75	7.80	7.93
LIQUIDAU	8.02	8.05	7.91	7.99
MEAN	8.14	7.90	7.85	7.96
TOTALN L	250	375	500	MEAN
SPACING				
30	8.37	8.11	7.85	8.11
60	7.91	7.69	7.86	7.82
MEAN	8.14	7.90	7.85	7.96
TOTALN S	250	375	500	MEAN
N FORM S				
SOLIDNC	7.28	7.39	7.03	7.23
SOLIDU	7.13	7.33	7.91	7.46
MEAN	7.20	7.36	7.47	7.34

EXTRA NONE 4.76

GRAND MEAN 7.46

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N FORM L	SPACING	TOTALN L	N FORM S	TOTALN S
SED	0.146	0.146	0.179	0.207	0.253

TABLE	N FORM L SPACING	N FORM L TOTALN L	SPACING TOTALN L	N FORM S TOTALN S
SED	0.207	0.253	0.253	0.358

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	58	0.507	6.8
1ST CUT MEAN DM%	24.2		

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GRASS

2ND CUT (2/9/75) DRY MATTER TONNES/HECTARE

*** TABLES OF MEANS ***

SPACING	30	60	MEAN	
N FORM L				
LIQUIDAA	0.78	0.88	0.83	
LIQUIDAU	1.08	1.05	1.06	
MEAN	0.93	0.96	0.94	
TOTALN L	250	375	500	MEAN
N FORM L				
LIQUIDAA	0.62	0.85	1.02	0.83
LIQUIDAU	0.88	1.11	1.20	1.06
MEAN	0.75	0.98	1.11	0.94
TOTALN L	250	375	500	MEAN
SPACING				
30	0.69	0.88	1.20	0.93
60	0.80	1.07	1.02	0.96
MEAN	0.75	0.98	1.11	0.94
TOTALN S	250	375	500	MEAN
N FORM S				
SOLIDNC	1.40	1.25	1.03	1.23
SOLIDU	1.17	0.98	0.99	1.04
MEAN	1.28	1.11	1.01	1.13

EXTRA NONE 0.27

GRAND MEAN 0.93

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N FORM L	SPACING	TOTALN L	N FORM S	TOTALN S
SED	0.071	0.071	0.087	0.100	0.123

TABLE	N FORM L SPACING	N FORM L TOTALN L	SPACING TOTALN L	N FORM S TOTALN S
SED	0.100	0.123	0.123	0.173

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	58	0.245	26.2
2ND CUT MEAN DM%	43.5		

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GRASS

3RD CUT (3/11/75) DRY MATTER TONNES/HECTARE

*** TABLES OF MEANS ***

SPACING	30	60	MEAN	
N FORM L				
LIQUIDAA	0.22	0.22	0.22	
LIQUIDAU	0.24	0.30	0.27	
MEAN	0.23	0.26	0.24	
TOTALN L	250	375	500	MEAN
N FORM L				
LIQUIDAA	0.15	0.27	0.24	0.22
LIQUIDAU	0.18	0.34	0.28	0.27
MEAN	0.16	0.30	0.26	0.24
TOTALN L	250	375	500	MEAN
SPACING				
30	0.14	0.28	0.27	0.23
60	0.19	0.33	0.25	0.26
MEAN	0.16	0.30	0.26	0.24
TOTALN S	250	375	500	MEAN
N FORM S				
SOLIDNC	0.56	0.41	0.27	0.41
SOLIDU	0.65	0.54	0.41	0.54
MEAN	0.60	0.47	0.34	0.47

EXTRA NONE 0.03

GRAND MEAN 0.29

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N FORM L	SPACING	TOTALN L	N FORM S	TOTALN S
SED	0.031	0.031	0.038	0.044	0.054

TABLE	N FORM L SPACING	N FORM L TOTALN L	SPACING TOTALN L	N FORM S TOTALN S
SED	0.044	0.054	0.054	0.076

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	58	0.107	36.9

3RD CUT MEAN DM% 21.1

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GRASS

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

*** TABLES OF MEANS ***

SPACING	30	60	MEAN	
N FORM L				
LIQUIDAA	9.12	8.84	8.98	
LIQUIDAU	9.41	9.23	9.32	
MEAN	9.26	9.04	9.15	
TOTALN L	250	375	500	MEAN
N FORM L				
LIQUIDAA	9.02	8.87	9.06	8.98
LIQUIDAU	9.08	9.49	9.38	9.32
MEAN	9.05	9.18	9.22	9.15
TOTALN L	250	375	500	MEAN
SPACING				
30	9.20	9.27	9.32	9.26
60	8.90	9.09	9.12	9.04
MEAN	9.05	9.18	9.22	9.15
TOTALN S	250	375	500	MEAN
N FORM S				
SOLIDNC	9.24	9.04	8.34	8.87
SOLIDU	8.94	8.85	9.31	9.03
MEAN	9.09	8.94	8.83	8.95

EXTRA NONE 5.06

GRAND MEAN 8.68

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	N FORM L	SPACING	TOTALN L	N FORM S	TOTALN S
SED	0.167	0.167	0.205	0.236	0.289

TABLE	N FORM L SPACING	N FORM L TOTALN L	SPACING TOTALN L	N FORM S TOTALN S
SED	0.236	0.289	0.289	0.409

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	58	0.578	6.7
TOTAL OF 3 CUTS MEAN DM%	29.6		
PLOT AREA HARVESTED	0.00111		