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83/R/CS/272 Nitrification Inhibitors - Ryegrass

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83/R/CS/272

NITRIFICATION INHIBITORS

Object: To study the effects of adding nitrification inhibitors to liquid and solid fertilizers on the yield and nitrogen uptake of grass cut for silage - Highfield Drive.

Sponsors: G.A. Rodgers, F.V. Widdowson.

The second year, ryegrass.

For previous year see 82/R/CS/272.

Design: 3 randomised blocks of 18 plots.

Whole plot dimensions: 2.4 x 12.2.

Treatments, cumulative to 1982: All combinations of:-

- | | |
|---------------|--|
| 1. N TIME(1) | Times of injecting aqueous urea and nitrification inhibitors: |
| 24 JAN | 24 January, 1983 |
| 15 MAR | 15 March |
| 2. N INHIB(1) | Nitrification inhibitors, added to injected aqueous urea supplying 375 kg N: |
| AU3 0 | None |
| AU3 ETR | Etridiazole at 1.5 kg |
| AU3 NIT | Nitrapyrin at 1.5 kg |

plus all combinations of:

- | | |
|---------------|---|
| 1. N TIME(2) | Times of broadcasting prilled urea treated with nitrification inhibitors: |
| 15 MAR | 15 March, 1983 |
| DIVIDED | Dressing divided equally between three dates, 15 March, 8 June, 4 Aug |
| 2. N INHIB(2) | Nitrification inhibitors, added to prilled urea supplying 375 kg N: |
| PU3 0 | None |
| PU3 DIC | Dicyandiamide at 56 kg |
| PU3 HYD | Hydroquinone at 5.0 kg |

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plus six extra treatments

EXTRA 'Nitro-Chalk' dressings (kg N):

0 None
NC3 S 375 on 15 March, 1983

Dressings divided equally between three dates 15 March,
8 June, 4 Aug

NC1 D 125
NC2 D 250
NC3 D 375
NC4 D 500

Basal applications: Manures: (0:18:36) at 500 kg.

Cultivations, etc.: - PK applied: 11 Jan, 1983. Cut: 6 June, 1 Aug, 31 Oct.

- NOTES: (1) N in herbage was measured for each cut.
(2) Amounts of ammonia volatilised from soil were measured one month after each treatment.
(3) Amounts of urea, ammonium and nitrate in soils were regularly measured from January.

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1ST CUT (6/6/83) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N INHIB(1) N TIME(1)	AU3 O	AU3 ETR	AU3 NIT	MEAN
24 JAN	6.20	6.38	6.03	6.20
15 MAR	5.06	5.32	5.25	5.21
MEAN	5.63	5.85	5.64	5.71

N INHIB(2) N TIME(2)	PU3 O	PU3 DIC	PU3 HYD	MEAN
15 MAR	5.68	5.48	5.69	5.62
DIVIDED	6.06	6.11	6.30	6.15
MEAN	5.87	5.79	6.00	5.89

EXTRA	O	NC3 S	NC1 D	NC2 D	NC3 D	NC4 D	MEAN
	0.97	5.98	3.50	5.86	6.07	5.96	4.72

GRAND MEAN 5.44

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

TABLE	EXTRA	N TIME(1)	N INHIB(1)	N TIME(2)
SED	0.389	0.225	0.275	0.225

TABLE	N INHIB(2)	N TIME(1)	N TIME(2)
SED	0.275	0.389	0.389

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

STRATUM	DF	SE	CV%
BLOCK.WP	34	0.476	8.8

1ST MEAN DM% 19.0

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2ND CUT (1/8/83) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N INHIB(1) N TIME(1)	AU3 O	AU3 ETR	AU3 NIT	MEAN
24 JAN	1.24	1.04	0.82	1.03
15 MAR	1.26	1.30	1.32	1.29
MEAN	1.25	1.17	1.07	1.16

N INHIB(2) N TIME(2)	PU3 O	PU3 DIC	PU3 HYD	MEAN
15 MAR	0.51	1.01	0.74	0.75
DIVIDED	1.26	0.91	1.28	1.15
MEAN	0.89	0.96	1.01	0.95

EXTRA	O	NC3 S	NC1 D	NC2 D	NC3 D	NC4 D	MEAN
	0.46	1.14	0.89	1.34	1.51	1.01	1.06

GRAND MEAN 1.06

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

TABLE	EXTRA	N TIME(1)	N INHIB(1)	N TIME(2)
SED	0.184	0.106	0.130	0.106

TABLE	N INHIB(2)	N TIME(1) N INHIB(1)	N TIME(2) N INHIB(2)
SED	0.130	0.184	0.184

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

STRATUM	DF	SE	CV%
BLOCK.WP	34	0.226	21.3
2ND MEAN DM%	34.7		

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3RD CUT (31/10/83) DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N INHIB(1)	AU3 0	AU3 ETR	AU3 NIT	MEAN
N TIME(1)				
24 JAN	0.63	0.69	0.74	0.69
15 MAR	0.79	0.69	0.76	0.75
MEAN	0.71	0.69	0.75	0.72

N INHIB(2)	PU3 0	PU3 DIC	PU3 HYD	MEAN
N TIME(2)				
15 MAR	0.57	0.65	0.55	0.59
DIVIDED	1.20	1.17	1.32	1.23
MEAN	0.88	0.91	0.94	0.91

EXTRA	0	NC3 S	NC1 D	NC2 D	NC3 D	NC4 D	MEAN
	0.45	0.86	0.97	1.22	1.12	0.87	0.92

GRAND MEAN 0.85

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

TABLE	EXTRA	N TIME(1)	N INHIB(1)	N TIME(2)
SED	0.104	0.060	0.073	0.060

TABLE	N INHIB(2)	N TIME(1) N INHIB(1)	N TIME(2) N INHIB(2)
SED	0.073	0.104	0.104

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

STRATUM	DF	SE	CV%
BLOCK.WP	34	0.127	14.9
3RD MEAN DM%	24.0		

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TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** TABLES OF MEANS *****

N INHIB(1) N TIME(1)	AU3 O	AU3 ETR	AU3 NIT	MEAN
24 JAN	8.07	8.12	7.60	7.93
15 MAR	7.11	7.31	7.33	7.25
MEAN	7.59	7.71	7.46	7.59

N INHIB(2) N TIME(2)	PU3 O	PU3 DIC	PU3 HYD	MEAN
15 MAR	6.76	7.14	6.98	6.96
DIVIDED	8.51	8.19	8.89	8.53
MEAN	7.64	7.67	7.94	7.75

EXTRA	O	NC3 S	NC1 D	NC2 D	NC3 D	NC4 D	MEAN
	1.88	7.98	5.36	8.43	8.69	7.84	6.70

GRAND MEAN 7.34

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

TABLE	EXTRA	N TIME(1)	N INHIB(1)	N TIME(2)
SED	0.464	0.268	0.328	0.268

TABLE	N INHIB(2)	N TIME(1) N INHIB(1)	N TIME(2) N INHIB(2)
SED	0.328	0.464	0.464

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

STRATUM	DF	SE	CV%
BLOCK.WP	34	0.569	7.7

TOTAL OF 3 CUTS MEAN DM% 25.9

PLOT AREA HARVESTED 0.00093