ROTHAMSTED RESEARCH

Yields of the Field Experiments 1982

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82/W/CS/200 Factors Affecting Yield - Ryegrass, White Clover, Lucerne

Rothamsted Research

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82/W/CS/200

FACTORS AFFECTING YIELD

Object: Originally to study some of the factors limiting yield of grass, clover and lucerne. Modified in 1982 to study the effects of nematode populations built up in 1977 to 1981, on freshly sown leys - Woburn Butt Furlong.

Sponsor: A.M. Spaull.

The sixth year, ryegrass, white clover, lucerne.

For previous years see 77-81/W/CS/200.

Design: Single replicate of 26 plots.

Whole plot dimensions: 1.68 x 4.42.

Treatments: All combinations of:-

1. SPECIES — Species (resown cumulatively in 1982):

GRASS	Ryegrass, S.23 (duplicated)
GRA+CLO	Ryegrass, S.23 + Clover, Blanca (quintuplicated)
CLOVER	Clover, Blanca (quadruplicated)
LUCERNE	Lucerne, Vertus (duplicated)

2. PATHCONT(81) — Control of pathogens and pests in 1977 to 1981:

NONE	No control applied
FULL	Full control applied

NOTES: (1) PATHCONT(81) consisted of:- (1) Aldicarb at 10 kg applied in the spring except to lucerne which received phorate at 5.0 kg, (2) benomyl foliar spray at 0.56 kg + phorate at 5.0 kg, applied as granules, after each cut, (3) four additional benomyl foliar sprays at 0.56 kg in winter, (4) Methiocarb at 0.48 kg, as pellets, applied at monthly intervals.

(2) All the treatments chosen were from the three-cut regime, irrigated in previous years. Previous nitrogen treatments were ignored.

(3) Irrigation was applied as follows (mm water):

20 May	16
10 June	7
16 July	17
23 July	25
29 July	25
5 Aug	25
13 Aug	12.5
17 Sept	12.5
Total	140

Standard applications: Manures: (0:20:20) at 380 kg. N at 75 kg per cut as 'Nitro-Chalk' to GRASS plots only. Weedkiller: Glyphosate at 1.5 kg in 280 l on two occasions.

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Seed: S23 Perennial ryegrass alone, sown at 20 kg.
S23 Perennial ryegrass, sown at 10 kg, with Blanca white clover, sown at 4 kg.
Blanca white clover alone, sown at 4 kg.
Lucerne, Vertus sown at 10 kg, inoculated with Rhizobium.

Cultivations, etc.:- Weedkiller applied: 10 Feb, 1982 and 3 Apr. Ploughed: 5 May. PK applied: 10 May. Sown: 11 May. N applied to GRASS plots only: 10 May, 13 July, 4 Aug. Cut: 7 July, 3 Aug, 15 Nov.

NOTE: Soil samples were taken before sowing and in the autumn for counts of root ectoparasitic nematodes.

1ST CUT (7/7/82) DRY MATTER TONNES/HECTARE

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

SPECIES / PATHCONT(81)	GRASS	GRA+CLO	CLOVER	LUCERNE	MEAN
NONE	2.27	2.01	1.48	0.76	1.69
FULL	2.76	1.97	1.12	1.13	1.70
MEAN	2.51	1.99	1.30	0.94	1.70

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

TABLE	SPECIES	PATHCONT(81)	SPECIES PATHCONT(81)	
SED	0.390	0.216	0.551	(1)
			0.349	(2)
			0.390	(3)
	0.326		0.461	(4)
	0.337		0.477	(5)
	0.261		0.370	(6)

REPLICATIONS FOR SPECIES TREATMENT VARIED
A FOR GRASS OR LUCERNE
B FOR GRA+CLO
C FOR CLOVER
(1) A v A
(2) B v B
(3) C v C
(4) A v B
(5) A v C
(6) B v C

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

STRATUM	DF	SE	CV%
WP	18	0.551	32.5

1ST CUT MEAN DM% 15.4

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2ND CUT(3/8/82)DRY MATTER TONNES/HECTARE

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

SPECIES PATHCONT(81)	GRASS	GRA+CLO	CLOVER	LUCERNE	MEAN
NONE	2.08	1.52	1.26	1.43	1.51
FULL	1.93	1.36	1.35	1.12	1.41
MEAN	2.00	1.44	1.31	1.28	1.46

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

TABLE	SPECIES	PATHCONT(81)	SPECIES PATHCONT(81)	
SED	0.197	0.109	0.279	(1)
			0.176	(2)
			0.197	(3)
	0.165		0.233	(4)
	0.171		0.241	(5)
	0.132		0.187	(6)

REPLICATIONS FOR SPECIES TREATMENT VARIED
A FOR GRASS OR LUCERNE
B FOR GRA+CLO
C FOR CLOVER
(1) A v A
(2) B v B
(3) C v C
(4) A v B
(5) A v C
(6) B v C

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

STRATUM	DF	SE	CV%
WP	18	0.279	19.1

2ND CUT MEAN DM% 16.2

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82/W/CS/200

3RD CUT(15/11/82)DRY MATTER TONNES/HECTARE

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

SPECIES PATHCONT(81)	GRASS	GRA+CLO	CLOVER	LUCERNE	MEAN
NONE	2.12	1.20	0.12	0.06	0.83
FULL	1.99	1.26	0.80	0.09	1.05
MEAN	2.06	1.23	0.46	0.08	0.94

3RD CUT MEAN DM% 17.4

Note: Because of large differences between species standard errors have been omitted.

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TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

SPECIES PATHCONT(81)	GRASS	GRA+CLO	CLOVER	LUCERNE	MEAN
NONE	6.46	4.73	2.86	2.25	4.04
FULL	6.68	4.59	3.27	2.35	4.16
MEAN	6.57	4.66	3.07	2.30	4.10

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

TABLE	SPECIES	PATHCONT(81)	SPECIES PATHCONT(81)	
SED	0.387	0.215	0.547	(1)
			0.346	(2)
			0.387	(3)
	0.324		0.458	(4)
	0.335		0.474	(5)
	0.260		0.367	(6)

REPLICATIONS FOR SPECIES TREATMENT VARIED
A FOR GRASS OR LUCERNE
B FOR GRA+CLO
C FOR CLOVER
(1) A v A
(2) B v B
(3) C v C
(4) A v B
(5) A v C
(6) B v C

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

STRATUM	DF	SE	CV%
WP	18	0.547	13.3

TOTAL OF 3 CUTS MEAN DM% 16.3

PLOT AREA HARVESTED 0.00038

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