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# Yields of the Field Experiments 1975

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## 75/ S/RN/1 - Rotation I - Grass, Lucerne

### Rothamsted Research

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75/S/RN/1

ROTATION I

Object: To compare nutrient cycles, uptakes of nutrients and responses to fresh P and K of lucerne and grass leys. To obtain an estimate of the rate of release of nutrients, particularly K, from Saxmundham soil. The effects of lucerne and grass leys will be compared on subsequent arable crops - Saxmundham.

Sponsors: A.E. Johnston, P.W.H. Brown.

For previous years see 'Details' 1967, 68/A/9(t), 69/S/RN/1(t), 70/S/RN/1(t) and 71-74/S/RN/1.

Whole plot dimensions (new treatments): 5.49 x 17.1.

Treatments: From 1899 to 1969 the experiment followed a four-course rotation of wheat, roots, barley, legumes. Each phase of the rotation was present each year on a separate block. From 1966 each plot was divided, a small area at the south end continued under the original treatment (OLDTREAT), on the larger sub-plots modified treatments (NEWTREAT) were applied (see below).

In 1970 the rotation was stopped and each pair of blocks was divided for lucerne and grass (the OLDTREAT sub-plots form a part of the Grass area).

TREATMENT 1899-1965	OLDTREAT Grass	NEWTREAT Lucerne	NEWTREAT Grass
	MANURE	MANURE	MANURE
D	(D)	(D)	(D)N
B	B	B	BN
N	N	(N)P2	(N)P2N
P	P	(P)P1	(P)P1N
K	K	(K)P2K	(K)P2KN
-	-	(-)P2	(-)P2N
PK	PK	(PK)P1K	(PK)P1KN
NK	NK	(NK)P2K	(NK)P2KN
NP	NP	(NP)P1	(NP)P1N
NPK	NPK	(NPK)P1K	(NPK)P1KN

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- D: Farmyard manure at 15 tonnes  
(D): Farmyard manure at 30 tonnes (1966-1969 15 tonnes on OLDTREAT), 60 tonnes in autumn 1969, none since.  
B: Bone meal at 0.5 tonnes  
N: 1899-1965 - 38 kg N as nitrate of soda. Since 1970 - 100 kg N (38 kg N on OLDTREAT) per cut as 'Nitro-Chalk'  
P: 1899-1965 - 40 kg P<sub>2</sub>O<sub>5</sub> as single superphosphate. Since 1966 - 50 kg P<sub>2</sub>O<sub>5</sub> as triple superphosphate  
P<sub>1</sub>,P<sub>2</sub>: 50, 100 kg P<sub>2</sub>O<sub>5</sub> as triple superphosphate (single superphosphate until 1965)  
K: 1899-1965 63 kg K<sub>2</sub>O as muriate of potash. Since 1966 - 126 kg K<sub>2</sub>O (75 kg K<sub>2</sub>O on OLDTREAT)

- NOTES: (1) For a fuller record of treatments see 'Details' etc.  
(2) On OLDTREAT grass, clover appeared naturally on some plots in 1975. To unify the plots white clover was sown on all at 33 kg.

Cultivations, etc.:-

Oldtreat Grass: PK and bone meal applied: 19 Feb, 1975. N applied: 26 Mar, 19 June. Clover broadcast and harrowed in: 6 May. Cut: 11 June and 5 Sept.

Newtreat Grass: P, K and bone meal applied: 19 Feb, 1975. N applied: 29 Apr and 19 June. Cut: 11 June and 5 Sept.

Newtreat Lucerne: Paraquat applied at 0.56 kg ion in 340 l: 7 Dec, 1974. PK and bone meal applied: 19 Feb, 1975. Cut: 19 June. Paraquat applied at 1.1 kg ion in 340 l: 10 July. Rotary cultivated: 14 July. Seed sown: 6 Aug but failed to germinate.

GRASS OLD TREATMENTS

1ST AND ONLY CUT (11/6/75)

DRY MATTER TONNES/HECTARE

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

MANURE

(D)	1.46
B	1.07
N	1.37
P	0.96
K	0.42
-	0.49
PK	1.31
NK	1.58
NP	1.75
NPK	1.55

MEAN 1.20

MEAN DM% 35.5

PLOT AREA HARVESTED 0.00050

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GRASS NEW TREATMENTS

DRY MATTER TONNES/HECTARE

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

	1ST CUT (11/6/75)	2ND CUT (5/8/75)	TOTAL OF 2 CUTS
MANURE			
(D)N	6.94	2.70	9.64
BN	5.72	1.44	7.17
(N)P2N	5.72	1.79	7.51
(P)P1N	5.77	1.43	7.20
(K)P2KN	5.70	1.82	7.52
(-)P2N	5.71	1.50	7.21
(PK)P1KN	6.02	1.89	7.91
(NK)P2KN	5.97	1.94	7.91
(NP)P1N	5.86	1.63	7.49
(NPK)P1KN	6.14	1.85	7.99
MEAN	5.95	1.80	7.75

1ST CUT MEAN DM% 27.3

2ND CUT MEAN DM% 39.8

TOTAL OF 2 CUTS MEAN DM% 33.6

1ST CUT PLOT AREA HARVESTED 0.00120

2ND CUT PLOT AREA HARVESTED 0.00156

LUCERNE NEW TREATMENTS

1ST AND ONLY CUT (19/6/75)

DRY MATTER TONNES/HECTARE

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

MANURE	
(D)	3.92
B	3.26
(N)P2	3.15
(P)P1	2.70
(K)P2K	3.61
(-)P2	2.89
(PK)P1K	3.60
(NK)P2K	3.68
(NP)P1	2.56
(NPK)P1K	3.33
MEAN	3.27

MEAN DM% 25.3

PLOT AREA HARVESTED 0.00003