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# Yields of the Field Experiments 1973

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

### Rothamsted Research

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73/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.

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For previous years see 'Details' 1967, 68/A/9(t), 69/S/RN/1(t), 70/S/RN/1(t) and 71-72/S/RN/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

CROP

Lucerne

Lucerne

Grass

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	(N2)P2	(N2)P2N
P	P	(N1)P1	(N1)P1N
K	K	(N1)P2K	(N1)P2KN
-	-	(N1)P2	(N1)P2N
PK	PK	(N1)P1K	(N1)P1KN
NK	NK	(N2)P2K	(N2)P2KN
NP	NP	(N2)P1	(N2)P1N
NPK	NPK	(N2)P1K	(N2)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 1970  
B: Bone meal at 0.5 tonnes  
N: 1899-1965 - Nitrate of soda to supply 38 kg N Since 1970 -  
100 kg N (38 kg N on OLDTREAT) as 'Nitro-Chalk'  
(N1), (N2): Residues of N applied as 'Nitro-Chalk' 1966-1969:  
63, 126 kg N (wheat, sugar beet, barley): 0, 63 kg N (beans)  
P: Superphosphate to supply 38 kg P<sub>2</sub>O<sub>5</sub>  
P1, P2: 50, 100 kg P<sub>2</sub>O<sub>5</sub> as superphosphate  
K: 1899-1965 - Muriate of potash to supply 63 kg K<sub>2</sub>O Unchanged  
on OLDTREAT since 1966 - 126 kg K<sub>2</sub>O (63 kg K<sub>2</sub>O on OLDTREAT)  
as muriate of potash  
NOTE: For a fuller record of treatments see 'Details' etc.

Whole plot dimensions (new treatments): 5.49 x 17.1.  
Areas harvested: Grass: 1st cut: New treatments: 0.00130.  
Old treatments: 0.00050.  
2nd cut: New treatments: 0.00145.  
Old treatments: 0.00050.  
Lucerne: 1st cut: New treatments: 0.00128.  
2nd cut: New treatments: 0.00123.

Seed: Grass: Timothy S 352 and Meadow Fescue S215.  
Lucerne: Europe.

Cultivations, etc.:-

Grass: P and K applied: 20 Feb, 1973. Bone meal applied: 27 Feb.  
N applied: 21 Mar. Cut: 7 June and 26 Sept. N applied after  
the first cut.  
Lucerne: P and K applied: 20 Feb, 1973. Bone meal applied:  
27 Feb. Cut: 12 June, 11 Sept.

NOTE: Yields were not taken from old treatment plots on the two  
southern blocks because of tile-drainage operations.

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TABLES OF MEANS

DRY MATTER: TONNES/HECTARE

OLDTREAT - Grass

MANURE

(D)	B	N	P	K	-	PK	NK	NP	NPK	Mean
1ST CUT										
1.59	0.59	1.79	0.30	0.23	0.33	0.38	1.92	1.89	1.88	1.09
Mean D.M. % 32.3										
2ND CUT										
0.22	0.00	0.57	0.00	0.00	0.00	0.00	0.57	0.50	1.00	0.29
Mean D.M. % 20.3										
TOTAL OF 2 CUTS										
1.82	0.59	2.36	0.30	0.23	0.33	0.38	2.49	2.39	2.89	1.38
Mean D.M. % 26.3										



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 DRY MATTER: TONNES/HECTARE  
 NFWTREAT - Lucerne  
 MANURE

(D)	B	(N2)P2	(N1)P1	(N1)P2K	(N1)P2	(N1)PIK	(N2)P2K	(N2)P1	(N2)PIK	Mean
	5.39	4.69	4.66	4.91	5.07	4.60	5.11	4.46	5.00	4.91
	1ST CUT									
	Mean D.M. % 23.3									
	4.20	3.19	3.50	3.50	3.64	3.25	3.93	3.19	3.68	3.61
	2ND CUT									
	Mean D.M. % 40.0									
	TOTAL OF 2 CUTS									
	9.59	7.88	8.16	8.40	8.71	7.85	9.04	7.64	8.68	8.52
	Mean D.M. % 31.6									

