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# Yields of the Field Experiments 1982

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## 82/S/RN/1 Rotation I - Grass, W. Beans, W. Wheat

### Rothamsted Research

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82/S/RN/1

ROTATION I

Object: To compare nutrient cycles, uptakes of nutrients and responses to fresh P and K. To obtain an estimate of the rate of release of nutrients, particularly K, from Saxmundham soil - Saxmundham.

Sponsor: A.E. Johnston.

The 83rd year, grass, w. beans, w. wheat.

For previous years see 'Details' 1967 and 1973, and 74-81/S/RN/1.

Whole plot dimensions (original treatments): 5.49 x 40.2.

Treatments: From 1899 to 1969 the experiment followed a four-course rotation of w. wheat, roots, s. 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 being continued under the original treatment until 1979 (OLDTREAT), modified treatments (NEWTREAT) being applied on the larger sub-plots (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). In 1977 lucerne was ploughed on one pair of blocks to start an arable rotation and in 1978 lucerne on the other blocks was replaced by a grass/clover mixture. The grass/clover mixture was ploughed in 1979 for a test of subsoiling. Part of the grass area on two of the blocks was ploughed in autumn 1980 and added to the arable rotation area; the remainder of the grass on these two blocks was killed with glyphosate at 1.8 kg in 200 l applied on 17 June, 1982 after the first cut; two cuts were taken from the other two blocks. Treatments to grass in 1982 were:

TREATMENT 1899-1965	OLDTREAT Grass 1966-79	NEWTREAT Grass 1966-82
	MANURE (D)	MANURE (D)N
D	(D)	(D)N
B	B	BN
N	N	(N)P2N
P	P	(P)P1N
K	K	(K)P2KN
-	-	(-)P2N
PK	PK	(PK)P1KN
NK	NK	(NK)P2KN
NP	NP	(NP)P1N
NPK	NPK	(NPK)P1KN

- 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 P205 as single superphosphate. Since 1966 50 kg P205 as triple superphosphate





82/S/RN/1

W. wheat: Weedkillers: Chlortoluron at 3.5 kg in 220 l. Mecoprop, bromoxynil and ioxynil (as 'Brittox' at 3.5 l) in 220 l applied with the benomyl. Fungicides: Benomyl at 0.42 kg. Carbendazim, maneb and tridemorph (as 'Cosmic' at 3.9 kg) in 220 l with captafol at 1.1 kg on two occasions, on the second occasion with the insecticide. Insecticide: Pirimicarb at 0.14 kg.

Seed: W. beans: Throws MS, sown at 250 kg.  
W. wheat: Avalon, sown at 400 seeds per m<sup>2</sup>.

Cultivations, etc.:-

W. beans: P, K and bonemeal applied: 2 Sept, 1981. Ploughed: 10 Sept. Seed sown: 23 Oct. Benomyl applied: 1 Apr, 1982. Carbendazim applied: 5 May. Combine harvested: 26 Aug.

W. wheat: P, K and bonemeal applied: 2 Sept, 1981. Ploughed: 10 Sept. Seed sown, seedbed N applied: 13 Oct. Chlortoluron applied: 14 Oct. Mecoprop, bromoxynil and ioxynil with benomyl applied: 1 Apr, 1982. N applied: 15 Apr. 'Cosmic' with captafol applied: 28 May. 'Cosmic' with captafol and pirimicarb applied: 30 June. Combine harvested: 11 Aug.

Grass section: P, K and bonemeal applied: 16 Feb, 1982. N applied: 23 Mar. Cut: 3 June. N applied: 17 June. Cut: 23 Aug.

NOTE: Yields of the first cut are based on all four blocks. Those of the second cut are based on the two blocks remaining after 17 June; the total of two cuts is based on the yields of these two blocks only.

#### GRASS

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

	1ST CUT(3/6/82)	2ND CUT(23/8/82)	TOTAL OF 2 CUTS
MANURE			
(D)N	5.47	3.36	8.63
BN	4.47	2.59	6.95
(N)P2N	4.87	3.71	8.56
(P)P1N	4.80	2.68	7.60
(K)P2KN	5.93	2.98	9.00
(-)P2N	4.75	3.03	8.41
(PK)P1KN	5.34	3.41	8.90
(NK)P2KN	5.56	3.37	9.22
(NP)P1N	4.89	2.75	8.06
(NPK)P1KN	5.69	2.89	8.91
MEAN	5.17	3.08	8.42
MEAN DM%	28.6	48.0	38.3
PLOT AREA HARVESTED	0.00095		

82/S/RN/1-3

WINTER WHEAT

GRAIN TONNES/HECTARE

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

TREATMNT	CNVNTIAL	SUBDUG	SUBDUG+F	MEAN	
MANURE					
(D)P2	8.95	8.35	8.73	8.68	
BN	8.13	7.71	8.20	8.02	
(N)P2	8.29	7.93	8.12	8.12	
(P)P1	7.83	7.98	8.08	7.97	
(K)P2K	7.26	7.78	7.76	7.60	
(-)P2	7.75	8.04	8.06	7.95	
(PK)P1K	7.65	7.75	7.74	7.71	
(NK)P2K	7.48	7.84	7.87	7.73	
(NP)P1	7.49	7.93	8.02	7.81	
(NPK)P1K	7.58	8.10	8.24	7.97	
MEAN	7.84	7.94	8.08	7.95	
N	80	120	160	200	MEAN
MANURE					
(D)P2	7.75	8.40	8.46	10.10	8.68
BN	6.25	7.81	8.72	9.29	8.02
(N)P2	6.39	8.00	8.97	9.10	8.12
(P)P1	6.43	7.43	8.57	9.43	7.97
(K)P2K	6.01	7.39	8.23	8.77	7.60
(-)P2	6.38	7.42	8.65	9.34	7.95
(PK)P1K	6.20	7.44	8.37	8.85	7.71
(NK)P2K	6.00	7.34	8.67	8.90	7.73
(NP)P1	6.07	7.73	8.50	8.96	7.81
(NPK)P1K	6.79	7.31	8.38	9.40	7.97
MEAN	6.43	7.63	8.55	9.21	7.95
N	80	120	160	200	MEAN
TREATMNT					
CNVNTIAL	6.26	7.53	8.47	9.11	7.84
SUBDUG	6.43	7.60	8.45	9.27	7.94
SUBDUG+F	6.59	7.75	8.74	9.25	8.08
MEAN	6.43	7.63	8.55	9.21	7.95

82/S/RN/1-3

WINTER WHEAT

GRAIN TONNES/HECTARE

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

		N	80	120	160	200
MANURE	TREATMNT					
(D)P2	CNVNTIAL		7.98	8.66	8.93	10.24
	SUBDUG		7.82	7.99	7.42	10.18
	SUBDUG+F		7.46	8.56	9.04	9.87
BN	CNVNTIAL		6.92	7.85	8.48	9.29
	SUBDUG		5.10	8.02	8.72	9.01
	SUBDUG+F		6.73	7.56	8.95	9.56
(N)P2	CNVNTIAL		6.65	7.75	9.18	9.60
	SUBDUG		6.09	7.98	9.08	8.58
	SUBDUG+F		6.42	8.29	8.66	9.12
(P)P1	CNVNTIAL		6.18	7.52	8.60	9.02
	SUBDUG		6.71	7.23	8.33	9.66
	SUBDUG+F		6.40	7.54	8.77	9.62
(K)P2K	CNVNTIAL		5.64	6.73	8.04	8.62
	SUBDUG		5.97	7.54	8.66	8.93
	SUBDUG+F		6.40	7.90	7.98	8.76
(-)P2	CNVNTIAL		5.89	7.48	8.49	9.12
	SUBDUG		6.51	7.62	8.54	9.47
	SUBDUG+F		6.73	7.15	8.93	9.43
(PK)P1K	CNVNTIAL		5.97	7.29	8.54	8.79
	SUBDUG		6.48	7.34	8.16	9.04
	SUBDUG+F		6.16	7.68	8.41	8.72
(NK)P2K	CNVNTIAL		5.43	7.40	8.66	8.43
	SUBDUG		5.98	7.42	8.54	9.41
	SUBDUG+F		6.59	7.20	8.81	8.87
(NP)P1	CNVNTIAL		5.56	7.73	8.12	8.56
	SUBDUG		6.67	7.37	8.64	9.04
	SUBDUG+F		5.97	8.10	8.74	9.29
(NPK)P1K	CNVNTIAL		6.36	6.85	7.62	9.47
	SUBDUG		6.96	7.54	8.45	9.43
	SUBDUG+F		7.06	7.52	9.08	9.29

GRAIN MEAN DM% 87.4

SUB PLOT AREA HARVESTED 0.00082