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Yields of the Field Experiments 1976

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76/R/BN/7 Barnfield - Beans, Ryegrass

Rothamsted Research

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76/R/BN/7

BARNFIELD

Object: The experiment was designed to study the effects of organic and inorganic manures on continuous root crops. It has been progressively modified to study effects on other crops.

The tenth year of beans on Sections 1 and 2. The second year of Italian ryegrass on the rest of the experiment except for the discard of Strip 4, sown to wheat for take-all studies.

For previous years see 'Details' 1967, 68/A/5(t), 69/R/BN/7, 70/R/BN/7(t), 71/R/BN/7(t), 72/R/BN/7(t) and 73-75/R/BN/7.

Plot dimensions:

Ryegrass: 10.7 x 55.9.

Beans: Section 1: 10.7 x 55.9.

Treatments to ryegrass: All combinations (except NKMG) of:-

Whole plots

1. MANURE Fertilisers and organic manures:

DN	D	N		
DNPK	D	N	P	K
NPKMG		N	P	K (Na) Mg
NP		N	P	
NPK		N	P	K
NPMG		N	P	(Na) Mg
N		N		
NKMG		N		K (Na) Mg

N: 75 kg N per cut in 1975 only. 100 kg N before 1st cut, 75 kg N after 1st cut in 1976. All as 'Nitro-Chalk'.

P: 35 kg P as single superphosphate (triple superphosphate in 1974).

K: 225 kg K as sulphate of potash.

(Na): 90 kg Na as sodium chloride until 1973.

Mg: 90 kg Mg as kieserite every fourth year since 1974 (sulphate of magnesia until 1973).

D: Farmyard manure at 35 tonnes (until 1975).

Quarter plots

2. NFORMRES Residues of forms of N (each supplying 96 kg N):

NS	Nitrate of soda
SA	Sulphate of ammonia
SA/CM	Sulphate of ammonia + castor meal
CM	Castor meal

Castor meal last applied 1961, others until 1959.

NOTE: Yields were taken only from half plots cropped with sugar beet in 1973.

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Treatments to beans: All combinations of:-

Whole plots

1. MANURE Fertilisers and organic manures:

D	D
DPK	D P K
PKMG	P K (Na) Mg
P	P
PK	P K
PMG	P (Na) Mg
NONE	None

Rates and forms as for ryegrass but FYM applied for 1976 bean crop.

Half plots

2. PREVCROP(74) Previous crop in 1974 (after continuous beans 1967-1973):

BEANS	Beans
FALLOW	Fallow

Quarter plots

3. PREVCROP(75) Previous crop in 1975:

BEANS	Beans
FALLOW	Fallow

- NOTES: (1) Treatment MANURE D, PREVCROP(74)BEANS, PREVCROP(75)FALLOW was not sown.
(2) Treatment MANURE NONE, PREVCROP(74)FALLOW, PREVCROP(75)FALLOW suffered partial crop failure. The yield presented includes that from the area of crop failure.

Standard applications:

Spring beans: Weedkiller: Mecoprop ('Methoxone P' at 4.2 l in 220 l).

Seed: Beans, Maris Bead, sown at 220 kg.

Cultivations, etc.:- P and K applied: 7 Oct, 1975.

Ryegrass: N applied: 26 Feb, 24 May. Cut three times: 18 May, 28 June, 17 Aug.

Spring Beans: Weedkiller applied: 9 Oct. FYM applied: 5 Nov. Ploughed: 6 Nov. Spring-tine cultivated: 2 Mar, 1976. Rotary harrowed and seed sown: 8 Mar. Combine harvested: 21 July.

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RYEGRASS

1ST CUT (18/5/76) DRY MATTER TONNES/HECTARE

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

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	6.04	5.52	5.66	5.48	5.67
DNPK	5.90	6.15	6.50	6.18	6.18
NPKMG	5.68	5.66	6.04	6.28	5.92
NP	4.81	4.65	5.36	5.27	5.02
NPK	5.53	5.62	5.62	5.53	5.58
NPMG	5.14	4.68	5.55	5.59	5.24
N	3.95	3.84	5.37	5.61	4.69
MEAN	5.29	5.16	5.73	5.71	5.47

MANURE NKMG 5.30

1ST CUT MEAN DM% 23.3

2ND CUT (28/6/76) DRY MATTER TONNES/HECTARE

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

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	1.80	2.06	2.02	2.15	2.01
DNPK	1.88	1.88	1.91	2.30	1.99
NPKMG	1.44	1.15	1.36	1.60	1.39
NP	1.31	1.34	1.94	2.07	1.67
NPK	1.28	1.19	1.68	1.87	1.51
NPMG	1.14	1.00	1.53	1.68	1.34
N	1.40	1.05	1.91	1.66	1.51
MEAN	1.47	1.38	1.77	1.91	1.63

MANURE NKMG 1.29

2ND CUT MEAN DM% 35.4

3RD CUT (17/8/76) DRY MATTER TONNES/HECTARE

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

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	0.31	0.35	0.36	0.71	0.43
DNPK	0.25	0.21	0.26	0.65	0.34
NPKMG	0.26	0.12	0.23	0.40	0.25
NP	0.08	0.11	0.19	0.26	0.16
NPK	0.12	0.12	0.23	0.37	0.21
NPMG	0.17	0.13	0.25	0.25	0.20
N	0.14	0.14	0.31	0.33	0.23
MEAN	0.19	0.17	0.26	0.42	0.26

MANURE NKMG 0.20

3RD CUT MEAN DM% 44.0

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RYEGRASS

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

NFORMRES MANURE	NS	SA	SA/CM	CM	MEAN
DN	8.15	7.92	8.04	8.34	8.11
DNPK	8.03	8.23	8.66	9.13	8.51
NPKMG	7.37	6.93	7.63	8.28	7.55
NP	6.20	6.10	7.49	7.60	6.85
NPK	6.93	6.94	7.54	7.77	7.29
NPMG	6.45	5.81	7.33	7.52	6.78
N	5.49	5.02	7.58	7.61	6.42
MEAN	6.95	6.71	7.75	8.04	7.36

MANURE NKMKG 6.79

TOTAL OF 3 CUTS MEAN DM% 34.2

PLOT AREA HARVESTED 0.00568

BEANS

GRAIN TONNES/HECTARE

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

PREVCROP(74) PREVCROP(75) MANURE	BEANS	FALLOW	FALLOW BEANS	FALLOW
D	0.92	*	0.91	1.32
DPK	0.94	1.18	1.36	1.37
PKMG	0.59	0.57	0.57	0.69
P	0.50	0.47	0.43	0.52
PK	0.66	0.56	0.73	0.70
PMG	0.62	0.64	0.67	0.52
NONE	0.41	0.53	0.39	0.12

* NOT SOWN

GRAIN MEAN DM% 81.5

SUB PLOT AREA HARVESTED 0.00732