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Yields of the Field Experiments 1975

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75/ W/RN/13 - Intensive Cereals - Ley, Potatoes, Wheat, Barley

Rothamsted Research

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75/W/RN/13

INTENSIVE CEREALS

Object: To study the effects of intensive cereal cropping on yield, incidence of soil-borne diseases and organic matter in the soil - Woburn Stackyard I.

Sponsor: D.B. Slope.

The tenth year, ley, potatoes, winter wheat, barley.

For previous years see 66/B/9(t), 67/B/9, 68/B/7(t), 69/W/RN/13(t), 70/W/RN/13(t), 71/W/RN/13(t) and 72-74/W/RN/13.

Design: For each experiment: 2 randomised blocks of 6 plots, split into 4.

Whole plot dimensions: 8.53 x 20.4.

Treatments:-

One experiment on winter wheat on part of the site of the classical wheat experiment 1877-1954

One experiment on barley on part of the site of the classical barley experiment 1877-1954

Factors tested on both experiments are the same but crop and nitrogen rates differ. All combinations of:-

Whole plots: 1. Previous crops:

PREVCROP

1968 1969 1970 1971 1972 1973 1974

L	P	C	C	C	L	P	C/C/L/P
P	C	C	C	L	P	C	C/L/P/C
C	C	C	L	P	C	C	L/P/C/C
C	C	L	P	C	C	C	P/C/C/C
C	L	P	C	C	C	L	C/C/C/L
C	C	C	C	C	C	C	C/C/C/C

Ley = 1 year ley P = Potatoes C = Cereal: wheat or barley.

Sub plots: 2. Nitrogen fertiliser (kg N):

N

To wheat	To barley	Wheat	Barley
63	50	63	50
126	100	126	100
189	150	189	150
252	200	252	200

NOTE: Ley and potatoes receive standard N only, residues of dressings to cereals are tested (NRESID).

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Basal applications: All crops: P2O5 at 130 kg, K2O at 260 kg as (0:14:28), half ploughed in, half applied to the plough furrow.

Standard applications:

Leys: N at 60 kg, as 'Nitro-Chalk', in seedbed and repeated after sowing.

Weedkiller: Amiotriazole at 4.5 kg in 280 l.

Potatoes: N at 150 kg as 'Nitro-Chalk'. Weedkiller: Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Insecticide: Demeton-s-methyl at 0.25 kg in 280 l. Fungicide: Mancozeb at 1.3 kg in 390 l.

Wheat: Weedkillers: Aminotriazole at 4.5 kg in 280 l. Ioxynil at 0.63 kg with mecoprop at 1.9 kg in 280 l.

Barley: Weedkillers: Aminotriazole at 4.5 kg in 280 l. Ioxynil at 0.52 kg with mecoprop at 1.6 kg in 280 l.

Seed: Leys: Italian ryegrass sown at 40 kg.

Potatoes: Pentland Crown.

Wheat: Cappelle sown at 200 kg.

Barley: Julia, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.: All plots: Half PK applied, ploughed: 30 Oct, 1974.

Remaining PK applied: 8 Nov. Spring-time cultivated: 27 Nov.

Leys: Aminotriazole applied: 11 Sept., 1974. Spring-time cultivated four times with crumbler on the second and forth occasions: 26 Feb, 3 Mar, 24 Apr, 28 Apr, 1975. N applied: 18 Apr, 11 June. Seed sown: 2 May. Topped: 8 July, 21 Aug.

Potatoes: Spring-time cultivated three times on the second occasion with crumbler: 26 Feb, 3 Mar, 24 Apr, 1975. N applied: 18 Apr. Deep-time cultivated: 25 Apr. Rotary cultivated, potatoes planted: 5 May. Linuron with paraquat applied: 22 May. Grubbed: 23 June. Rotary ridged: 24 June. Insecticide applied: 25 June. Fungicide applied: 15 July. Haulm mechanically destroyed: 26 Sept. Sprayed with undiluted B.O.V. at 160 l: 2 Oct. Lifted: 6 Oct.

Wheat: Seed sown: 27 Nov, 1974. N applied: 24 Mar, 1975. Weedkiller applied: 8 May. Combine harvested: 12 Aug.

Barley: Spring-time cultivated twice, second time with crumbler: 26 Feb, 3 Mar, 1975. Seed sown: 4 Mar. N applied: 19 Mar. Spring-time cultivated with crumbler three times, seed resown: 1 May. Weedkiller applied: 4 June. Combine harvested: 18 Aug.

- NOTES: (1) No cuts were taken from the leys because of poor growth in a dry year.
(2) The barley was resown because of poor germination and bird damage on the first sowing.
(3) Estimates of eyespot (*Cercospora herpotrichoides*) and take-all (*Gaeumannomyces graminis*) were made on both cereal crops.

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POTATOES

WHEAT SITE

TOTAL TUBERS TONNES/HECTARE

*** TABLES OF MEANS ***

NRESID	63	126	189	252	MEAN
	25.4	23.9	24.2	20.3	23.4

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

*** TABLES OF MEANS ***

NRESID	63	126	189	252	MEAN
	97.4	96.7	96.3	96.6	96.2

BARLEY SITE

TOTAL TUBERS TONNES/HECTARE

*** TABLES OF MEANS ***

NRESID	50	100	150	200	MEAN
	29.5	29.8	26.6	26.1	27.8

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

*** TABLES OF MEANS ***

NRESID	50	100	150	200	MEAN
	97.5	97.4	97.5	97.4	97.5

PLOT AREA HARVESTED 0.00139

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WINTER WHEAT

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

N	63	126	189	252	MEAN
PREVCROP					
C/C/L/P	2.75	3.36	3.45	3.43	3.25
C/L/P/C	1.46	2.97	3.39	2.83	2.66
L/P/C/C	1.91	3.15	3.14	2.80	2.75
C/C/C/C	1.81	3.04	3.22	2.77	2.71
MEAN	1.98	3.13	3.30	2.96	2.84

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

TABLE	N	PREVCROP* N
SED	0.150	0.300
* WITHIN THE SAME LEVEL OF PREVCROP ONLY		

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

STRATUM	DF	SE	CV%
BLOCK.WP	3	0.153	5.4
BLOCK.WP.SP	12	0.300	10.6

GRAIN MEAN DM% 88.2

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

N	63	126	189	252	MEAN
PREVCROP					
C/C/L/P	2.41	4.00	4.52	4.89	3.95
C/L/P/C	1.25	2.85	3.84	3.57	2.88
L/P/C/C	1.86	2.50	3.51	3.74	2.90
C/C/C/C	2.92	3.10	3.62	3.24	3.22
MEAN	2.11	3.11	3.87	3.86	3.24

STRAW MEAN DM% 89.8

SUB PLOT AREA HARVESTED 0.00277

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BARLEY

GRAIN TONNES/HECTARE

*** TABLES OF MEANS ***

N	50	100	150	200	MEAN
PREVCROP					
C/C/L/P	2.08	3.13	3.23	2.88	2.83
C/L/P/C	1.73	2.83	2.94	2.82	2.58
L/P/C/C	1.84	2.47	2.73	2.87	2.49
C/C/C/C	1.64	2.11	2.14	2.29	2.04
MEAN	1.82	2.64	2.77	2.71	2.48

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

TABLE	N	PREVCROP*
		N
SED	0.117	0.234
* WITHIN THE SAME LEVEL OF PREVCROP ONLY		

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

STRATUM	DF	SE	CV%
BLOCK.WP	3	0.286	11.5
BLOCK.WP.SP	12	0.234	9.4

GRAIN MEAN DM% 86.9

STRAW TONNES/HECTARE

*** TABLES OF MEANS ***

N	50	100	150	200	MEAN
PREVCROP					
C/C/L/P	1.65	2.57	2.57	2.41	2.30
C/L/P/C	1.41	2.42	2.41	2.58	2.21
L/P/C/C	1.75	2.18	2.35	2.63	2.23
C/C/C/C	1.26	1.76	1.96	1.98	1.74
MEAN	1.52	2.23	2.32	2.40	2.12

STRAW MEAN DM% 81.6

SUB PLOT AREA HARVESTED 0.00277