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Yields of the Field Experiments 1976

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

Rothamsted Research

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76/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 11th 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 72-75/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. PREVCROP

Previous crops:

	1969	1970	1971	1972	1973	1974	1975
C/C/L/P	L	P	C	C	C	L	P
C/L/P/C	P	C	C	C	L	P	C
L/P/C/C	C	C	C	L	P	C	C
P/C/C/C	C	C	L	P	C	C	C
C/C/C/L	C	L	P	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. N

Nitrogen fertiliser (kg N):

Wheat	Barley	To wheat	To 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: P205 at 130 kg, K20 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 the seedbed, repeated after sowing.

Weedkiller: Glyphosate at 1.7 kg in 340 l to wheat stubble only.

Potatoes: N at 150 kg as 'Nitro-Chalk'. Weedkiller: Linuron at 1.2 kg plus paraquat at 0.42 kg ion in 280 l. Insecticide: Pirimicarb at 0.14 kg in 450 l. Fungicide with insecticide: Mancozeb at 1.3 kg with demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l. Haulm desiccant: Diquat at 0.59 kg ion in 280 l.

Wheat: Weedkillers: Glyphosate at 1.7 kg in 340 l. Ioxynil at 0.63 kg plus mecoprop at 1.9 kg in 280 l.

Barley: Weedkiller: Ioxynil at 0.52 kg and mecoprop at 1.6 kg in 280 l.

Seed: Ley: Italian ryegrass, sown at 40 kg

Potatoes: Pentland Crown

Wheat: Cappelle sown at 210 kg

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

Cultivations, etc.: - All plots: Half PK applied, ploughed: 24 Oct, 1975. Remaining PK applied: 27 Oct.

Leys: Weedkiller applied to wheat stubble only: 5 Oct, 1975. Spring-tine cultivated wheat blocks only: 27 Oct. Deep-tine cultivated barley blocks only: 29 Dec. Spring-tine cultivated barley blocks: 2 Mar, 1976, wheat blocks: 9 Mar. N applied: 20 Apr. Seed sown: 27 Apr. N applied: 9 June. Cut once: 20 Oct.

Potatoes: Rotary cultivated: 14 Oct, 1975. Spring-tine cultivated barley blocks: 2 Mar, 1976, wheat blocks: 9 Mar. N applied: 30 Mar. Rotary cultivated, potatoes planted: 6 Apr. Weedkiller applied: 7 May. Rotary ridged: 3 June. Pirimicarb applied: 18 June. Fungicide with insecticide applied: 30 June. Fungicide applied: 30 July. Haulm mechanically destroyed: 15 Sept. Haulm desiccant applied: 6 Oct. Lifted: 19 Oct.

Wheat: Glyphosate applied: 5 Oct, 1975. Spring-tine cultivated, seed sown: 27 Oct. N applied: 1 Apr, 1976. Weedkiller applied: 20 Apr. Combine harvested: 2 Aug.

Barley: Deep-tine cultivated: 29 Dec, 1975. Spring-tine cultivated: 2 Mar, 1976. Seed sown: 8 Mar. N applied: 9 Mar. Weedkiller applied: 28 Apr. Combine harvested: 26 July.

NOTES: (1) Five plots of wheat N 63 were damaged by birds shortly before harvest. No yields are presented for N 63 on wheat.
(2) Four other plots of wheat were also affected by bird damage:

PREVCROP	N
C/C/L/P	189
C/L/P/C	126
C/L/P/C	189
L/P/C/C	126

Estimated values were used in the analysis.

76/W/RN/13

LEY WHEAT SITE

1ST AND ONLY CUT (20/10/76) DRY MATTER TONNES/HECTARE

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

NRESID	63	126	189	252	MEAN
	0.68	0.64	0.66	0.51	0.62

1ST CUT MEAN DM% 15.9 PLOT AREA HARVESTED 0.00089

LEY BARLEY SITE

1ST AND ONLY CUT (20/10/76) DRY MATTER TONNES/HECTARE

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

NRESID	50	100	150	200	MEAN
	0.95	0.85	0.98	1.07	0.96

1ST CUT MEAN DM% 14.0 PLOT AREA HARVESTED 0.00089

POTATOES WHEAT SITE

TOTAL TUBERS TONNES/HECTARE

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

NRESID	63	126	189	252	MEAN
	22.6	24.3	22.4	24.7	23.5

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

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

NRESID	63	126	189	252	MEAN
	93.6	93.7	93.3	93.3	93.5

PLOT AREA HARVESTED 0.00139

POTATOES BARLEY SITE

TOTAL TUBERS TONNES/HECTARE

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

NRESID	50	100	150	200	MEAN
	30.4	33.4	32.8	31.9	32.1

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

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

NRESID	50	100	150	200	MEAN
	95.3	95.7	95.0	95.8	95.7

PLOT AREA HARVESTED 0.00139

76/W/RN/13

WINTER WHEAT

GRAIN TONNES/HECTARE

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

	N	126	189	252	MEAN
PREVCROP					
C/C/L/P		2.41	1.97	1.92	2.10
C/L/P/C		2.22	1.92	1.74	1.96
L/P/C/C		1.59	2.05	1.74	1.79
C/C/C/C		1.63	1.94	1.91	1.83
MEAN		1.96	1.97	1.83	1.92

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

TABLE	N	PREVCROP*
		N
	0.090	0.179

* WITHIN THE SAME LEVEL OF PREVCROP ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP.SP	4	0.179	9.3
GRAIN MEAN DM%			88.0

STRAW TONNES/HECTARE

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

	N	126	189	252	MEAN
PREVCROP					
C/C/L/P		3.02	2.80	2.56	2.79
C/L/P/C		2.39	2.64	2.75	2.59
L/P/C/C		1.71	2.60	2.43	2.24
C/C/C/C		2.14	2.55	2.13	2.27
MEAN		2.31	2.65	2.47	2.48

STRAW MEAN DM% 87.5

SUB PLOT AREA HARVESTED 0.00273

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BARLEY

GRAIN TONNES/HECTARE

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

N	50	100	150	200	MEAN
PREVCROP					
C/C/L/P	3.31	3.18	3.54	3.75	3.44
C/L/P/C	3.16	3.61	3.36	3.29	3.36
L/P/C/C	2.73	3.48	3.83	3.43	3.37
C/C/C/C	2.34	2.76	2.38	2.93	2.60
MEAN	2.88	3.26	3.28	3.35	3.19

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

TABLE	N	PREVCROP*
		N
SED	0.163	0.326

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

STRATUM	DF	SE	CV%
BLOCK.WP.SP	12	0.326	10.2
GRAIN MEAN DM%	87.5		

STRAW TONNES/HECTARE

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

N	50	100	150	200	MEAN
PREVCROP					
C/C/L/P	1.83	2.11	2.52	2.62	2.27
C/L/P/C	1.55	1.74	2.21	2.05	1.89
L/P/C/C	1.36	1.91	2.48	2.27	2.00
C/C/C/C	1.00	1.54	1.48	1.59	1.40
MEAN	1.44	1.83	2.17	2.13	1.89

STRAW MEAN DM% 88.6

SUB PLOT AREA HARVESTED 0.00273