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89/W/RN/13 Intensive Cereals - Potatoes

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89/W/RN/13

INTENSIVE CEREALS

Object: To study the effects of leys of different duration, following prolonged intensive cereal cropping, on a sequence of arable crops - Woburn Stackyard I.

Sponsor: J. McEwen.

The 24th year, w. wheat and s. wheat.

For previous years see 'Details' 1973 and 74-88/W/RN/13.

Design: 4 randomised blocks of 6 plots split into 6.

Treatments: Until 1977 the experiment tested all phases of the five-course rotation: ley, potatoes, cereal, cereal, cereal and continuous cereal. From 1977 to 1980 all phases were cropped with cereal. The experiment was in two halves, one in which the cereal was w. wheat, sown on part of the site of the classical continuous wheat experiment 1877-1954 and one in which the cereal was s. barley, sown on part of the site of the classical continuous barley experiment 1877-1954. From 1981 the experiment was used to establish grass/clover leys of different durations for tests on w. wheat in 1987. Plots not in ley were sown to w. wheat on both halves of the experiment. All leys were ploughed for 1987 and the site sown to w. wheat. This was followed by potatoes in 1988 and by wheat in 1989, testing all combinations of the following treatments:

Whole plots

1. **LEY AGE** Length of ley (until ploughing in summer 1986):

- 1 YEAR
- 2 YEARS
- 3 YEARS
- 4 YEARS
- 5 YEARS
- 6 YEARS

Sub plots

2. **N** Nitrogen fertilizer in 1989 (kg N) as 'Nitram':

- 0
- 50
- 100
- 150
- 200
- 250

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NOTE: Because of an error twelve sub plots from four whole plots were not sown with the rest of the experiment. These had the combinations **LEY AGE 1 YEAR** with N 50, 100 and 250, **LEY AGE 4 YEARS** with N 50, 100 and 150 and **LEY AGE 5 YEARS** with N 0, 50, 100 (from two separate whole plots), 150 and 250. They were sown to w. wheat later on two occasions but failed and were re-sown to s. wheat. Yields from these plots were not recorded. Estimated values were used in the analysis.

Basal applications: Manures: Dolomite at 5 t. (0:18:36) at 556 kg. Manganese at 0.096 kg Mn as a foliar spray in 220 l applied twice. Weedkillers: Mecoprop at 2.5 kg with bromoxynil at 0.34 kg and clopyralid at 0.07 kg in 220 l. Metsulfuron-methyl at 6.0 g in 220 l to s. wheat only. Fungicides: Prochloraz at 0.40 kg with carbendazim at 0.15 kg applied with the growth regulator in 220 l. Propiconazole at 0.12 kg in 220 l. Fenpropimorph at 0.75 kg with maneb at 1.6 kg and carbendazim at 0.25 kg in 220 l. Molluscicide: Methiocarb at 0.20 kg. Nematicide: Carbofuran at 7.5 kg. Growth regulator: Chlormequat chloride at 1.6 kg.

Seed: W. wheat: Mercia, with methiocarb pellets, sown at 165 kg - omitted plots sown at 180 kg.

S. wheat: Alexandria, sown at 180 kg.

Cultivations, etc.:- Ploughed: 28 Oct, 1988. Dolomite applied, methiocarb applied: 29 Oct. PK applied: 31 Oct. Carbofuran applied and cultivated in: 1 Nov. Spike harrowed with crumbler attached, seed sown: 2 Nov. Omitted plots sown: 13 Dec. Omitted plots spring-tine cultivated: 6 Feb, 1989. Omitted plots re-sown: 7 Feb. Omitted plots harrowed and sown to s. wheat: 31 Mar. Mecoprop, bromoxynil and clopyralid applied: 28 Apr. Mn applied: 29 Apr and 22 May. N applied: 3 May. Prochloraz and growth regulator applied: 17 May. Propiconazole applied: 5 June. Metsulfuron-methyl applied to s. wheat: 13 June. Fenpropimorph, maneb and carbendazim applied: 3 July. Combine harvested: 7 Aug.

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GRAIN TONNES/HECTARE

***** Tables of means *****

N	0	50	100	150	200	250	Mean
LEY AGE							
1 YEAR	1.26	2.90	4.71	5.34	5.51	5.43	4.19
2 YEARS	2.22	3.98	5.14	5.30	6.16	6.22	4.84
3 YEARS	2.57	4.46	5.72	5.95	6.63	6.31	5.27
4 YEARS	2.35	4.88	5.47	6.77	6.75	6.89	5.52
5 YEARS	2.52	4.63	5.73	5.87	6.30	6.36	5.23
6 YEARS	3.10	5.18	6.04	6.35	7.15	6.62	5.74
Mean	2.34	4.34	5.47	5.93	6.41	6.30	5.13

*** Standard errors of differences of means ***

LEY AGE	N	LEY AGE
		N
0.473	0.152	0.583
Except when comparing means with the same level(s) of		
LEY AGE		0.373

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	15	0.669	13.0
BLOCK.WP.SP	78	0.528	10.3

GRAIN MEAN DM% 87.6

SUB PLOT AREA HARVESTED 0.00165