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86/W/RN/13 Intensive Cereals - Ley

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86/W/RN/13

INTENSIVE CEREALS

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

Sponsors: A.E. Johnston, J. McEwen.

The 21st year, ley.

For previous years see 'Details' 1973 and 74-85/W/RN/13.

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 wheat experiment 1877-1954 and one in which the cereal was s. barley, sown on part of the site of the classical barley experiment 1877-1954. From 1981 the experiment is being used to establish 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.

The following crop sequences are being followed:

| 1981 | 82 | 83 | 84 | 85 | 86 | 87 |
|------|----|----|----|----|----|----|
| W(5) | W | W | W | W | L | W |
| W(5) | W | W | W | L | L | W |
| W(6) | W | W | L | L | L | W |
| W(7) | W | L | L | L | L | W |
| W(8) | L | L | L | L | L | W |
| L | L | L | L | L | L | W |

L = clover/grass ley W = w. wheat (5)etc = number of years continuous cereal

NOTE: Yields are not taken in the period 1981-86.

Standard applications:

Ley, 1st year: Manures: N at 50 kg as 'Nitro-Chalk'. (5:14:30) at 340 kg.

Ley, 2nd, 3rd, 4th, 5th and 6th years: Manures: (0:18:36) at 400 kg.

Seeds: S23 perennial ryegrass at 27 kg, Blanca white clover at 7 kg, mixture sown at 34 kg.

86/W/RN/13

Cultivations, etc.:-

Ley, 1st year: Ploughed: 4 Dec, 1985. Heavy spring-tine cultivated, spike harrowed with crumbler attached, seeds sown: 7 May, 1986.

N applied, rolled: 8 May. NPK applied: 5 June. Topped: 12 June.

Ley, 2nd, 3rd, 4th, 5th and 6th years: PK applied: 29 Nov, 1985.

Cut: 12 June, 1986.

86/W/RN/16

EFFECTS OF DEEP PK

Object: To study the residual effects of subsoiling and of incorporating a large dressing of PK in either the subsoil or topsoil, on yields and nutrient uptakes of s. barley - Woburn Butt Furlong.

Sponsors: J. McEwen, A.E. Johnston.

The 12th year, s. barley.

For previous years see 74-85/W/RN/16.

Design: 4 series (for crops) each of 3 randomised blocks of 4 plots.

Whole plot dimensions: 4.27 x 2.59.

Treatments: All combinations of:-

Series

- | | |
|-------------|----------------------------------|
| 1. PREVCROP | Previous crops in 1984 and 1985: |
| B FALLOW | S. barley, fallow |
| FALLOW B | Fallow, s. barley |
| OATS B | S. oats, s. barley |
| BARLEY B | S. barley, s. barley |

Plots

- | | |
|-----------|--|
| 2. PK SUB | Extra PK and subsoil treatment (applied autumn 1973): |
| | Extra PK Subsoil (25-50 cm) treatment |
| - - - | None None |
| - - S | None Subsoiled |
| P K T | To topsoil (0-25 cm) None |
| P K S | To subsoil Subsoiled |

- NOTES: (1) The rates of P and K were 1930 kg P205, as superphosphate and 460 kg K20 as muriate of potash. These quantities, applied to subsoil, were chosen to equalize available P and K in top and subsoil.
- (2) Subsoiling was done by spade, after removing the topsoil which was then replaced. PK to subsoil was worked in by forking.
- (3) PK to topsoil was applied half before ploughing in autumn half soon after on the plough furrow.

Basal applications:

All series: Manures: (20:10:10) at 750 kg. Weedkillers: Clopyralid at 0.07 kg with bromoxynil octanoate at 0.34 kg and mecoprop at 2.5 kg applied with the fungicide in 250 l. Fungicide: Tridemorph at 0.52 kg.

Seed: Triumph, dressed with triadimenol and fuberidazole, sown at 160 kg.

86/W/RN/16

Cultivations, etc.:-

All series: Ploughed: 13 Jan, 1986. NPK applied, rotary harrowed,
seed sown: 11 Apr. Weedkillers and fungicide applied: 16 May.
Combine harvested: 20 Aug.

GRAIN TONNES/HECTARE

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

| PK SUB | - - - | - - S | P K T | P K S | MEAN |
|----------|-------|-------|-------|-------|------|
| PREVCROP | | | | | |
| B FALLOW | 5.45 | 5.68 | 6.03 | 5.93 | 5.77 |
| FALLOW B | 5.14 | 5.42 | 5.80 | 5.71 | 5.52 |
| OATS B | 4.53 | 5.18 | 4.71 | 4.91 | 4.83 |
| BARLEY B | 3.94 | 3.81 | 3.70 | 3.99 | 3.86 |
| MEAN | 4.77 | 5.02 | 5.06 | 5.14 | 5.00 |

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

| TABLE | PK SUB | PREVCROP* PK SUB |
|-------|--------|---------------------|
| SED | 0.131 | 0.262 |

* WITHIN THE SAME LEVEL OF PREVCROP ONLY

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

| STRATUM | DF | SE | CV% |
|-----------------|----|-------|-----|
| SERIES.BLOCK | 8 | 0.401 | 8.0 |
| SERIES.BLOCK.WP | 24 | 0.321 | 6.4 |

GRAIN MEAN DM% 80.1

SUB PLOT AREA HARVESTED 0.00057