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80/W/RN/16 Effects of Deep Pk

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80/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.

Sponsor: J. McEwen.

The seventh year, s. barley.

For previous years see 74-79/W/RN/16.

Design: 4 series of 3 randomised blocks of 4 plots with PREVCROP on series.

Whole plot dimensions: 4.27 x 2.59.

Treatments: All combinations of:-

Series

- | | | |
|-------------|--|--|
| 1. PREVCROP | Previous cropping (1974-1977) (all in barley 1978 & 1979): | |
| P B B | W. wheat, sugar beet, s. barley, potatoes | |
| W B B | Sugar beet, s. barley, potatoes, w. wheat | |
| S B B | S. barley, potatoes, w. wheat, sugar beet | |
| B B B | Potatoes, w. wheat, sugar beet, 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: Manures: All Series: Magnesian limestone at 2.5 t; (20:10:10) at 540 kg, combine drilled. Weedkillers: Mecoprop, bromoxynil and ioxynil ('Brittox' 3.5 l in 280 l). Fungicide: Tridemorph ('Beacon' 0.7 l in 280 l).

Seed: Georgie, dressed with ethirimol, sown at 160 kg.

80/W/RN/16

Cultivations, etc.:- Magnesian limestone applied: 31 Oct, 1979. Ploughed: 2 Nov. Spring-tine cultivated with crumbler attached, seed sown: 29 Feb, 1980. Weedkiller applied: 25 Apr. Fungicide applied: 13 May. Harvested by hand: 7 Aug.

NOTE: N, P, K, Na, Ca and Mg contents of grain were measured.

GRAIN TONNES/HECTARE

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

| PK SUB PREVCROP | - - - | - - S | P K T | P K S | MEAN |
|--------------------|-------|-------|-------|-------|------|
| P B B | 5.99 | 6.59 | 5.78 | 6.34 | 6.18 |
| W B B | 5.43 | 5.97 | 5.31 | 5.90 | 5.65 |
| S B B | 5.67 | 6.27 | 5.45 | 6.40 | 5.95 |
| B B B | 5.13 | 5.57 | 5.69 | 5.96 | 5.59 |
| MEAN | 5.55 | 6.10 | 5.56 | 6.15 | 5.84 |

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

| TABLE | PK SUB | PREVCROP* PK SUB |
|-------|--------|---------------------|
| ----- | ----- | ----- |
| SED | 0.173 | 0.346 |

* ONLY WHEN COMPARING MEANS WITH SAME LEVELS OF PREVCROP

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

| STRATUM | DF | SE | CV% |
|-------------|----|-------|-----|
| BLOCK.WP | 6 | 0.186 | 3.2 |
| BLOCK.WP.SP | 24 | 0.423 | 7.2 |

GRAIN MEAN DM% 80.7

STRAW TONNES/HECTARE

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

| PK SUB PREVCROP | - - - | - - S | P K T | P K S | MEAN |
|--------------------|-------|-------|-------|-------|------|
| P B B | 4.36 | 4.40 | 4.07 | 4.58 | 4.35 |
| W B B | 3.90 | 4.25 | 3.54 | 4.35 | 4.01 |
| S B B | 4.27 | 4.19 | 4.03 | 4.19 | 4.17 |
| B B B | 3.87 | 3.81 | 4.65 | 4.28 | 4.15 |
| MEAN | 4.10 | 4.16 | 4.07 | 4.35 | 4.17 |

STRAW MEAN DM% 58.8

SUB PLOT AREA HARVESTED 0.00065