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79/W/RN/16 Effects of Deep P K - Barley

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79/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 barley - Woburn Butt Furlong.

Sponsor: J. McEwen.

The sixth year, spring barley.

For previous years see 74-78/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): | |
| P B | Wheat, sugar beet, barley, potatoes | |
| W B | Sugar beet, barley, potatoes, wheat | |
| S B | Barley, potatoes, wheat, sugar beet | |
| B B | Potatoes, wheat, sugar beet, barley | |

Plots

- | | | |
|-----------|---|------------------------------|
| 2. PK SUB | Extra PK and subsoil treatment (applied autumn 1973): | |
| | Extra PK | Subsoil (25-50 cm) treatment |
| - - | None | None |
| - SUB | None | Subsoiled |
| PKTOP - | To topsoil (0-25 cm) | None |
| - PKSUB | 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: (20:14:14) at 450 kg combine drilled. Weedkillers: Glyphosate at 1.7 kg in 280 l, Mecoprop, bromoxynil and ioxynil ('Brittox' 3.5 kg in 250 l).

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

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Cultivations, etc.:- Glyphosate applied: 14 Sept, 1978. Ploughed: 17 Nov.
 Spring-tine cultivated, with crumbler attached, twice: 16 Apr, 1979,
 20 Apr. Seed sown: 23 Apr. 'Brittox' applied: 1 June. Combine harvested:
 28 Aug.

NOTE: Samples of grain were analysed for contents of N, P, K, Na, Ca and Mg.

GRAIN TONNES/HECTARE

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

PK SUB PREVCROP	- -	- SUB	PKTOP -	- - PKSUB	MEAN
P B	4.17	4.98	4.24	4.74	4.53
W B	3.04	3.34	3.07	3.44	3.22
S B	4.67	5.01	4.35	5.28	4.83
B B	2.82	3.21	2.80	3.11	2.99
MEAN	3.68	4.13	3.62	4.14	3.89

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

TABLE	PK SUB	PREVCROP* PK SUB
-----	-----	-----
SED	0.150	0.300

* ONLY WHEN COMPARING MEANS WITH SAME LEVELS OF PREVCROP

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

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.278	7.1
BLOCK.WP.SP	24	0.368	9.5

GRAIN MEAN DM% 81.8

STRAW TONNES/HECTARE

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

PK SUB PREVCROP	- -	- SUB	PKTOP -	- - PKSUB	MEAN
P B	3.33	4.45	3.82	4.21	3.95
W B	3.48	3.58	3.25	3.87	3.55
S B	4.68	4.76	4.01	5.06	4.63
B B	2.95	3.35	2.86	3.23	3.10
MEAN	3.61	4.04	3.49	4.09	3.81

STRAW MEAN DM% 79.1

SUB PLOT AREA HARVESTED 0.00065