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Yields of the Field Experiments 1984

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84/W/RN/16 Effects of Deep P K - S. Barley, S. Oats

Rothamsted Research

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84/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 tenth year, s. barley and s. oats.

For previous years see 74-83/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:

| 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 P₂O₅, as superphosphate and 460 kg K₂O 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.
- (4) One series was fallow in 1984.

Basal applications:

All series: Weedkiller: Glyphosate at 1.4 kg in 250 l.
Series II and IV: S. barley: Manures: (20:10:10) at 750 kg.
Weedkillers: Mecoprop with bromoxynil and ioxynil (as 'Brittox' at 3.5 l) in 280 l. Fungicide: Tridemorph at 0.52 kg in 250 l.
Series III: S. oats: Manures: (20:10:10) at 750 kg. Weedkillers: Mecoprop with bromoxynil and ioxynil (as 'Brittox' at 3.5 l) in 280 l.

Seed: S. barley: Triumph, dressed with triadimenol and fuberidazole, sown at 160 kg.
S. oats: Trafalgar, sown at 200 kg.

Cultivations, etc.:-

Series I: Fallow: Glyphosate applied: 7 Sept, 1983. Ploughed: 20 Oct. Spring-tine cultivated: 14 Mar, 1984. Spring-tine cultivated with crumbler attached: 16 Mar, 16 May. Rotary cultivated: 25 July.
Series II and IV: S. barley: Glyphosate applied: 7 Sept, 1983. Ploughed: 20 Oct. NPK applied: 14 Mar, 1984. Spring-tine cultivated, spring-tine cultivated with crumbler attached, seed

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sown: 16 Mar. 'Brittox' applied: 16 May. Fungicide applied:
15 June. Harvested by hand: 13 Aug.

Series III: S. oats after s. barley: Glyphosate applied: 7 Sept, 1983.
Ploughed: 20 Oct. NPK applied: 14 Mar, 1984. Spring-tine
cultivated, spring-tine cultivated with crumbler attached, seed
sown: 16 Mar. 'Brittox' applied: 16 May. Harvested by hand:
13 Aug.

SERIES II BARLEY AFTER FALLOW

GRAIN TONNES/HECTARE

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

| PK SUB | - - - | - - S | P K T | P K S | MEAN |
|--------|-------|-------|-------|-------|------|
| | 4.32 | 4.47 | 4.35 | 4.62 | 4.44 |

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

| TABLE | PK SUB |
|-------|--------|
| ----- | ----- |
| SED | 0.131 |

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

| STRATUM | DF | SE | CV% |
|----------|----|-------|-----|
| BLOCK.WP | 6 | 0.161 | 3.6 |

GRAIN MEAN DM% 84.7

STRAW TONNES/HECTARE

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

| PK SUB | - - - | - - S | P K T | P K S | MEAN |
|--------|-------|-------|-------|-------|------|
| | 3.45 | 3.61 | 3.48 | 3.46 | 3.50 |

STRAW MEAN DM% 86.4

SUB PLOT AREA HARVESTED 0.00071

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SERIES IV BARLEY AFTER BARLEY

GRAIN TONNES/HECTARE

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

| | | | | | |
|--------|-------|-------|-------|-------|------|
| PK SUB | - - - | - - S | P K T | P K S | MEAN |
| | 4.60 | 4.48 | 4.37 | 4.62 | 4.52 |

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

| | |
|-------|--------|
| TABLE | PK SUB |
| ----- | ----- |
| SED | 0.288 |

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

| | | | |
|----------|----|-------|-----|
| STRATUM | DF | SE | CV% |
| BLOCK.WP | 6 | 0.353 | 7.8 |

GRAIN MEAN DM% 84.1

STRAW TONNES/HECTARE

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

| | | | | | |
|--------|-------|-------|-------|-------|------|
| PK SUB | - - - | - - S | P K T | P K S | MEAN |
| | 4.16 | 4.05 | 4.01 | 4.09 | 4.08 |

STRAW MEAN DM% 85.1

SUB PLOT AREA HARVESTED 0.00071

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SERIES III OATS

GRAIN TONNES/HECTARE

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

| PK SUB | - - - | - - S | P K T | P K S | MEAN |
|--------|-------|-------|-------|-------|------|
| | 3.22 | 3.08 | 3.44 | 3.24 | 3.25 |

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

| TABLE | PK SUB |
|-------|--------|
| ----- | ----- |
| SED | 0.278 |

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

| STRATUM | DF | SE | CV% |
|----------|----|-------|------|
| BLOCK.WP | 6 | 0.340 | 10.5 |

GRAIN MEAN DM% 83.4

STRAW TONNES/HECTARE

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

| PK SUB | - - - | - - S | P K T | P K S | MEAN |
|--------|-------|-------|-------|-------|------|
| | 3.03 | 3.04 | 2.57 | 3.18 | 2.96 |

STRAW MEAN DM% 79.2

SUB PLOT AREA HARVESTED 0.00071