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# Yields of the Field Experiments 1985

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## 85/R/CS/246 Effects of Subsoiling and Deep P K - S. Barley

### Rothamsted Research

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85/R/CS/246

# EFFECTS OF SUBSOILING AND DEEP PK

Object: To study the effects of thorough subsoil disturbance and the incorporation of P and K into the subsoil on soil and crop parameters and on yield of s. barley - Great Field I.

Sponsors: J. McEwen, A.E. Johnston, D.P. Yeoman.

The sixth year, s. barley.

For previous years see 80-84/R/CS/246.

Whole plot dimensions: 4.27 x 17.7.

Design: 2 replicates of 28 plots, fully randomised.

Treatments: All combinations of:-

1. PK SUB            Extra PK and subsoil treatment (applied autumn/winter 1979/80 only):
  - - -            None, mouldboard ploughed (duplicated)
  - - S            Subsoiled
  - P - S            P to subsoil
  - K S            K to subsoil
  - P K S            PK to subsoil
  - P K T            PK to topsoil, mouldboard ploughed
2.        N            Nitrogen fertilizer (kg N) as 'Nitro-Chalk' (27.5% N) (cumulative to previous years):
  - 0
  - 40
  - 80
  - 120

- NOTES: (1) Rates of P and K were 1000 kg P205, as superphosphate, 500 kg K2O, as muriate of potash.
- (2) Subsoiling was done with Wye double-digger which turns a furrow with a conventional plough share, to a depth of 23 cm, and at the same time rotary cultivates the bottom of the adjacent furrow to a further depth of 15 cm. When applying P and K this was distributed ahead of the rotary cultivator.
- (3) The topsoil PK dressing was equally divided before and after ploughing.
- (4) All treatments were mouldboard ploughed for 1981 to 1985.

Basal applications: Manures: (0:24:24) at 260 kg. Weedkillers: Clopyralid at 0.05 kg and bromoxynil octanoate at 0.24 kg with mecoprop (as 'CMPP' at 3.0 l) applied with the fungicide in 200 l. Fungicide: Tridemorph at 0.52 kg.

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

Cultivations, etc.: Ploughed: 13 Nov, 1984. PK applied, spring-tine cultivated, N treatments applied, spring-tine cultivated again, seed sown: 19 Mar, 1985. Weedkillers and fungicide applied: 10 May. Combine harvested: 22 Aug.

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GRAIN TONNES/HECTARE

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

|        | N | 0    | 40   | 80   | 120  | MEAN |
|--------|---|------|------|------|------|------|
| PK SUB |   |      |      |      |      |      |
| - - -  |   | 3.72 | 5.74 | 7.64 | 7.38 | 6.12 |
| - - S  |   | 3.41 | 6.35 | 7.54 | 8.26 | 6.39 |
| P - S  |   | 4.16 | 5.19 | 7.59 | 7.95 | 6.22 |
| - K S  |   | 3.49 | 5.69 | 7.35 | 7.97 | 6.12 |
| P K S  |   | 4.39 | 6.22 | 7.60 | 8.13 | 6.58 |
| P K T  |   | 4.56 | 6.05 | 7.44 | 7.96 | 6.50 |
| MEAN   |   | 3.92 | 5.86 | 7.54 | 7.86 | 6.29 |

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

| TABLE | PK SUB | N     | PK SUB | N       |
|-------|--------|-------|--------|---------|
| SED   | 0.283  |       | 0.567  | MIN REP |
|       | 0.245  | 0.214 | 0.491  | MAX-MIN |
|       |        |       | 0.401  | MAX REP |

PKSUB  
 MAX REP - - -  
 MAX-MIN - - - V ANY OF REMAINDER  
 MIN REP ANY OF REMAINDER

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

| STRATUM | DF | SE    | CV% |
|---------|----|-------|-----|
| WP      | 32 | 0.567 | 9.0 |

GRAIN MEAN DM% 81.3

STRAW TONNES/HECTARE

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

|        | N | 0    | 40   | 80   | 120  | MEAN |
|--------|---|------|------|------|------|------|
| PK SUB |   |      |      |      |      |      |
| - - -  |   | 1.38 | 2.80 | 4.07 | 5.06 | 3.33 |
| - - S  |   | 1.10 | 2.85 | 4.01 | 5.20 | 3.29 |
| P - S  |   | 1.67 | 2.51 | 4.44 | 5.26 | 3.47 |
| - K S  |   | 1.13 | 2.93 | 4.20 | 4.51 | 3.19 |
| P K S  |   | 1.74 | 2.94 | 4.57 | 5.80 | 3.76 |
| P K T  |   | 1.63 | 3.25 | 4.28 | 5.57 | 3.68 |
| MEAN   |   | 1.43 | 2.87 | 4.23 | 5.21 | 3.44 |

STRAW MEAN DM% 82.1

PLOT AREA HARVESTED 0.00217