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

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83/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 - Gt. Field I.

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

The fourth year, s. barley.

For previous years see 80-82/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)
(cumulative to previous years):

0+0	None
40+80	40 on 16 Mar, 1983 plus 80 on 26 May
80+80	80 on 16 Mar, 1983 plus 80 on 26 May
120+80	120 on 16 Mar, 1983 plus 80 on 26 May

- NOTES: (1) Rates of P and K were 1000 kg P₂O₅, as superphosphate, 500 kg K₂O, as muriate of potash.
(2) Subsoiling was done with the 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, 1982 and 1983.
(5) Nitrogen applied on 26 May was required because of exceptional leaching of seedbed N.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled.
Weedkillers: Dicamba, mecoprop and MCPA (as 'Herrisol' at 5.0 l) in 250 l.

Seed: Triumph, seed dressed with ethirimol, sown at 160 kg.

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Cultivations, etc.:- Ploughed: 10 Nov, 1982. Spring-tine cultivated on two occasions: 8 Mar, 11 Mar, 1983. Rotary harrowed: 17 Mar. Seed sown: 18 Mar. Weedkillers applied: 24 May. Combine harvested: 8 Aug.

GRAIN TONNES/HECTARE

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

	N	0+0	40+80	80+80	120+80	MEAN
PK SUB						
- - -		1.41	4.13	4.71	5.95	4.05
- - S		1.31	4.18	5.47	6.18	4.28
P - S		1.59	4.00	5.10	5.85	4.14
- K S		1.00	4.59	5.24	6.49	4.33
P K S		1.94	4.71	5.47	6.11	4.56
P K T		2.16	4.49	5.21	6.14	4.50
MEAN		1.55	4.32	5.13	6.10	4.27

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

TABLE	PK SUB	N	PK SUB N	
SED	0.280		0.560	MIN REP
	0.242	0.212	0.485	MAX-MIN
			0.396	MAX REP

PK SUB
 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	0.560	13.1

GRAIN MEAN DM% 85.0

STRAW TONNES/HECTARE

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

	N	0+0	40+80	80+80	120+80	MEAN
PK SUB						
- - -		0.43	1.71	1.71	3.17	1.76
- - S		0.49	1.40	2.02	2.92	1.71
P - S		0.50	1.77	2.04	2.64	1.74
- K S		0.50	1.64	2.17	3.03	1.83
P K S		0.63	1.91	2.41	3.41	2.09
P K T		0.64	1.77	2.16	3.17	1.94
MEAN		0.52	1.70	2.03	3.07	1.83

STRAW MEAN DM% 93.1 PLOT AREA HARVESTED 0.00217