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

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84/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 fifth year, s. barley.

For previous years see 80-83/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
40
80
120

- 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, 1983 and 1984.

Basal applications: Manures: (0:20:20) at 310 kg, combine drilled.
Weedkillers: Glyphosate at 1.4 kg in 250 l. Mecoprop at 1.4 kg with ioxynil at 0.18 kg and bromoxynil at 0.18 kg in 250 l. Fungicide: Tridemorph at 0.52 kg in 250 l.

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

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Cultivations, etc.:— Glyphosate applied: 26 Sept, 1983. Ploughed: 13 Dec.
N treatments applied: 15 Mar, 1984. Spring-tine cultivated, seed sown:
19 Mar. Mecoprop with ioxynil and bromoxynil applied: 15 May.
Fungicide applied: 6 June. Combine harvested: 17 Aug.

NOTE: Because of water logging four plots were lost, those with treatment combinations

PK SUB	- K S	P K T	- - -	P - S
N	0	80	80	40

Estimated values were used in the analysis.

GRAIN TONNES/HECTARE

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

	N	0	40	80	120	MEAN
PK SUB						
- - -		3.83	5.18	6.90	7.77	5.92
- - S		4.13	6.57	7.34	7.70	6.43
P - S		5.23	5.25	7.59	7.26	6.33
- K S		5.14	5.89	7.48	7.70	6.55
P K S		4.86	6.50	8.56	8.38	7.07
P K T		5.03	6.34	7.81	7.56	6.68
MEAN		4.58	5.84	7.51	7.73	6.42

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

TABLE	PK SUB	N	PK SUB	N
SED	0.488		0.976	MIN REP
	0.422	0.369	0.845	MAX-MIN
			0.690	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	28	0.976	15.2
GRAIN MEAN DM%	84.2		

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STRAW TONNES/HECTARE

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

	N	0	40	80	120	MEAN
PK SUB						
- - -		1.33	2.02	3.13	4.09	2.64
- - S		1.37	2.36	3.89	4.37	2.99
P - S		1.93	2.20	3.32	4.24	2.92
- K S		1.73	2.51	3.48	4.35	3.02
P K S		1.73	2.61	3.81	4.99	3.28
P K T		1.88	2.70	4.51	4.63	3.43
MEAN		1.61	2.35	3.61	4.39	2.99

STRAW MEAN DM% 84.0

PLOT AREA HARVESTED 0.00217