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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