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

Rothamsted Research

Rothamsted Research (1984) *83/R/CS/246 Effects of Subsoiling and Deep P K- S. Barley* ; Yields Of The Field Experiments 1983, pp 147 - 148 - DOI: <https://doi.org/10.23637/ERADOC-1-44>

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