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81/R/CS/216 and 81/W/CS/216 Effects of Subsoiling & Deep Pk - S. Barley

Rothamsted Research

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81/R/CS/216 and 81/W/CS/216

EFFECTS OF SUBSOILING & DEEP PK

Object: To study the effects of subsoiling and of incorporating a large dressing of PK in the subsoil on yields and nutrient uptakes of a sequence of crops - Rothamsted (R) Delharding and Woburn (W) Road Piece.

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The fourth year, s. barley.

For previous years see 78-80/R&W/CS/216.

Design: 3 randomised blocks of 6 plots.

Whole plot dimensions: 4.27 x 13.7.

Treatments:

TREATMNT	Machines and incorporation of extra P and K into the subsoil:
000 00	Not subsoiled, no P or K
FOO FO	Farm standard, unwinged, subsoiler, no P or K, autumn 1977 & autumn 1979
NOO NO	N.C.A.E. winged subsoiler, no P or K, autumn 1977 & autumn 1979
NPK NO	N.C.A.E. winged subsoiler, P and K applied autumn 1977, subsoiled only autumn 1979
WOO 00	Wye double digger, no P or K, autumn 1977 only
WPK 00	Wye double digger, P and K applied, autumn 1977 only

- NOTES: (1) The rates of P and K were 1930 kg P_2O_5 , as triple superphosphate and 460 kg K_2O as muriate of potash.
- (2) In autumn 1977 the Farm standard, unwinged, subsoiler was set to work at a depth of 38 cm at intervals of 50 cm Delharding (R) and at a depth of 50 cm at intervals of 70 cm Road Piece (W). In autumn 1979 it was set to work at a depth of 56 cm at intervals of 76 cm Delharding (R) and 142 cm Road Piece (W).
- (3) In autumn 1977 the N.C.A.E. winged subsoiler had a single tine set to work at a depth of 40 cm at intervals of 60 cm on plots not given P and K and at alternate depths of 30 cm and 40 cm spaced 30 cm apart on plots given P and K; fertiliser was applied behind the subsoiling points. In autumn 1979 the winged subsoiler had three tines, the centre tine preceding the others, all set to work at a depth of 40 cm spaced 40 cm apart.
- (4) The Wye double digger turned a furrow with a conventional plough to a depth of 23 cm and at the same time rotary cultivated the bottom of the furrow to a further depth of 15 cm. When applying P & K this was distributed ahead of the rotary cultivator.

Basal applications:

Delharding (R): Manures: (20:10:10) at 560 kg. Weedkillers: Glyphosate at 1.5 l in 250 l. Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 5.0 l) in 250 l with the fungicide. Fungicide: Tridemorph at 0.53 kg in 250 l.

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Road Piece (W): Manures: (20:10:10) at 560 kg. Weedkillers: Glyphosate at 1.0 l in 280 l, mecoprop with bromoxynil and ioxynil (as 'Brittox' at 3.5 l) with the fungicide in 280 l. Fungicide: Ethirimol (as 'Milgo E' at 0.7 l).

Seed: Both sites: Georgie, dressed with ethirimol, sown at 160 kg.

Cultivations, etc.:-

Delharding (R): Glyphosate applied: 25 Sept, 1980. Ploughed: 12 Dec. NPK applied, rotary harrowed, seed sown: 13 Apr, 1981. 'Banlene Plus' with fungicide applied: 29 May. Combine harvested: 2 Sept.

Road Piece (W): Glyphosate applied: 26 Sept, 1980. Ploughed: 30 Oct. NPK applied: 20 Feb, 1981. Spring-tine cultivated with crumbler attached, seed sown: 27 Feb. 'Brittox' with fungicide applied: 1 May. Combine harvested: 3 Aug.

81/R/CS/216 DELHARDING (R)

GRAIN TONNES/HECTARE

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

TREATMNT	000 00	FOO FO	NOO NO	NPK NO	WOO 00	WPK 00	MEAN
	4.04	4.56	4.11	3.73	3.78	4.59	4.13

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

TABLE	TREATMNT
-----	-----
SED	0.484

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

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.592	14.3

GRAIN MEAN DM% 83.3

PLOT AREA HARVESTED 0.00260

81/W/CS/216 ROAD PIECE (W)

GRAIN TONNES/HECTARE

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

TREATMNT	000 00	FOO FO	NOO NO	NPK NO	WOO 00	WPK 00	MEAN
	4.21	4.41	4.23	4.30	4.72	4.78	4.44

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

TABLE	TREATMNT
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SED	0.258

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

STRATUM	DF	SE	CV%
BLOCK.WP	10	0.316	7.1

GRAIN MEAN DM% 86.0

PLOT AREA HARVESTED 0.00251