

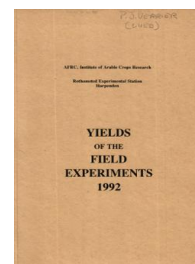
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92/R/BK/1 Broadbalk - W. Wheat, Potatoes

Rothamsted Research

Rothamsted Research (1993) *92/R/BK/1 Broadbalk - W. Wheat, Potatoes* ; Yields Of The Field Experiments 1992, pp 11 - 16 - DOI: <https://doi.org/10.23637/ERADOC-1-47>

92/R/BK/1

BROADBALK

Object: To study the effects of organic and inorganic manures on continuous w. wheat. From 1968 two three-year rotations were included: potatoes, beans, w. wheat and fallow, w. wheat, w. wheat. In 1979 the first rotation was changed to fallow, potatoes, w. wheat. In 1980 the second rotation reverted to continuous w. wheat. Since 1985 part of the second rotation has been added to the first to extend the rotation to fallow, potatoes, w. wheat, w. wheat, w. wheat.

The 149th year, w. wheat, fallow, potatoes.

For previous years see 'Details' 1967 and 1973, Station Report for 1966, pp. 229-231, Station Report for 1968, Part 2, Station Report for 1982, Part 2, pp. 5-44 and 74-91/R/BK/1.

Areas harvested:

Wheat:	Section	
	0	0.00311
	1	0.00572
	4, 5, 6 and 7	0.00473
	8 and 9	0.00497
Potatoes:	3	0.00348

Treatments:

Whole plots

PLOT	Plot	Fertilizers and organic manures:-		
		Treatments until 1967	Treatments from 1968	Treatments from 1985
01DN4PK	01	-	D N2 P K	D N4 P K
21DN2	21	D	D N2	D N2
22D	22	D	D	D
030	03	None	None	None
05F	05	P K Na Mg	P K (Na) Mg	PK Mg
06N1F	06	N1 P K Na Mg	N1 P K (Na) Mg	N1 P K Mg
07N2F	07	N2 P K Na Mg	N2 P K (Na) Mg	N2 P K Mg
08N3F	08	N3 P K Na Mg	N3 P K (Na) Mg	N3 P K Mg
09N4F	09	N*1 P K Na Mg	N4 P K (Na) Mg	N4 P K Mg
10N2	10	N2	N2	N2
11N2P	11	N2 P	N2 P	N2 P
12N2PNA	12	N2 P Na	N2 P Na	N2 P Na
13N2PK	13	N2 P K	N2 P K	N2 P K
14N2PKMG	14	N2 P Mg	N2 P K Mg	N2 P K Mg
15N5F	15	N2 P K Na Mg	N3 P K (Na) Mg	N5 P K Mg
16N6F	16	N*2 P K Na Mg	N2 P K (Na) Mg	N6 P K Mg
17N1+3FH	17	N2 (A)	N2 1/2 (P K (Na) Mg)	N1+3 1/2 (PK Mg) +
18N0+3FH	18	P K Na Mg (A)	N2 1/2 (P K (Na) Mg)	N0+3 1/2 (PK Mg) +
19C	19	C	C	C
20NKMG	20	N2 K Na Mg	N2 K (Na) Mg	N2 K Mg

(A) Alternating

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+ This change since 1980. Treatments shown are those to w. wheat; autumn N alternates. Potatoes receive N3 1/2 (PK Mg) on both Plots 17 and 18.

N1,N2,N3,N4,N5,N6: 48, 96, 144, 192, 240, 288 kg N (as sulphate of ammonia until 1967, except N* which was nitrate of soda. All as 'Nitro-Chalk' in spring from 1968 to 1985, as 'Nitram' since 1986.)

N0+3; N1+3: None in autumn + 144 kg N in spring; 48 kg N in autumn + 144 kg N in spring

P: 35 kg P as single superphosphate until 1987, triple superphosphate in 1974 and since 1988

K: 90 kg K as sulphate of potash

Na: 55 kg Na as sulphate of soda

(Na): 16 kg Na as sulphate of soda until 1973

Mg: 30 kg Mg annually to Plot 14, 35 kg Mg every third year to other plots since 1974. All as kieserite since 1974, previously as sulphate of magnesia annually

D: Farmyard manure at 35 tonnes

C: Castor meal to supply 96 kg N until 1988, none since

F: P K (Na) Mg H: Half rate

Strips of sub plots: Until 1967 wheat alone was grown on the experiment, with some bare fallowing on strips of sub plots. From 1968, ten sub plots were started with the following cropping:-

70, 71, 72,
73, 74, 75,
and and and

SECTION	Section	68	69	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
0/W41	0*	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
1/W26	1	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
-	2	BE	W	P	BE	W	F	P	W	F	P	W	W	W	F	P	W	W	W	F
POTATOES	3	W	W	F	W	W	F	W	W	W	W	W	W	F	P	W	W	W	F	P
4/W2	4	W	P	BE	W	P	P	W	F	P	W	F	P	W	W	W	F	P	W	W
5/W1	5	W	F	W	W	F	W	W	W	W	W	W	W	F	P	W	W	W	F	P
6/W15	6**	F	W	W	F	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
7/W3	7	P	BE	W	P	BE	W	F	P	W	F	P	W	W	W	F	P	W	W	W
8/W4	8+	W	W	W	W	W	W	W	F	W	W	W	W	W	W	F	W	W	W	W
9/W34	9	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W

W = w. wheat, P = potatoes, BE = s. beans, F = fallow

* Straw incorporated since 1987. ** No sprays except weedkillers since 1985. + No weedkillers.

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- NOTES:** (1) For a fuller record of treatments see 'Details' etc.
(2) From autumn 1975 to autumn 1986, chalk was applied at 2.9 t each autumn to all plots in sets of Sections on a three-year cycle. Year 1: Sections 1,2,3. Year 2: Sections 6,7,8,9. Year 3: Sections 0,4,5. Since autumn 1988 a five year cycle has been used. Year 1: Sections 1,3. Year 2: Sections 2,8. Year 3: Sections 7,9. Year 4: Sections 4,6. Year 5: Sections 0,5.

Experimental diary:

All Sections:

- 30-Sep-91 : T : P applied.
07-Oct-91 : T : K, Na and Mg applied.
09-Oct-91 : T : FYM applied.
11-Oct-91 : B : Ploughed and furrow pressed.
14-Oct-91 : B : Rotary harrowed.

Cropped Sections:

W. wheat:

- 31-Aug-91 : T : Straw chopped (section 0).
09-Oct-91 : T : Chalk applied at 2.9 t (sections 4 and 6)
10-Oct-91 : T : Autumn N treatments applied.
15-Oct-91 : T : Rotary harrowed, Apollo, dressed Fonofos Seed Treatment, drilled at 200 kg.
16-Oct-91 : T : Rolled.
06-Dec-91 : T : Stomp 400 at 3.3 l and Stefes IPU at 2.5 l in 200 l (except section 8).
10-Apr-92 : T : Spring N treatments applied.
14-May-92 : T : Sportak 45 at 0.90 l, Calixin at 0.50 l and Tripart Brevis at 2.25 l in 200 l (except section 6).
09-Jun-92 : T : Chiltern Olé at 2.0 l and Mistral at 1.0 l in 200 l (except section 6).
23-Jun-92 : T : Radar at 0.50 l and Mistral at 0.50 l in 200 l (except section 6).
28-Jun-92 : T : Roundup at 6.0 l with High Trees Mixture B at 2.9 l in 150 l (except section 8).
06-Aug-92 : T : Combine harvested.

Potatoes:

- 15-Jan-92 : T : Chisel ploughed.
10-Apr-92 : T : N treatments applied.
13-Apr-92 : T : Heavy spring-tine cultivated.
23-Apr-92 : T : Rotary harrowed, planted Pentland Crown Elite 2.
13-May-92 : T : Rotalin at 5.5 l in 400 l.
22-Jun-92 : T : Manex at 2.0 l with Nu Film P at 0.18 l in 200 l.
08-Jul-92 : T : Manex at 2.0 l and Aphox at 0.28 kg with Nu Film P at 0.18 l in 200 l.
16-Jul-92 : T : Manex at 2.0 l with Nu Film P at 0.18 l in 200 l.
28-Jul-92 : T : Manex at 2.5 l with Nu Film P at 0.18 l in 200 l.
17-Aug-92 : T : Chiltern Super-Tin 4L at 0.56 l with Nu Film P at 0.18 l in 200 l.
29-Aug-92 : T : Chiltern Super-Tin 4L at 0.56 l with Nu Film P at 0.18 l in 200 l.
10-Sep-92 : T : Reglone at 4.0 l in 200 l.
22-Sep-92 : T : Haulm mechanically destroyed.
02-Oct-92 : T : Lifted.

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Experimental diary:

Fallow:

- 15-Jan-92 : T : Chisel ploughed.
- 13-Apr-92 : T : Heavy spring-tine cultivated.
- 18-May-92 : T : Heavy spring-tine cultivated.
- 25-Jun-92 : T : Cultivated by rotary grubber.

NOTE: Samples of grain and straw from Sections 1 and 5 and samples of potato tubers from Section 3 were taken for chemical analysis.

W. WHEAT

GRAIN TONNES/HECTARE

***** Tables of means *****

SECTION PLOT	5/W1	4/W2	7/W3	8/W4	6/W15	1/W26	9/W34	0/W41
01DN4PK	7.54	8.12	6.97	*	4.81	*	*	*
21DN2	8.38	9.18	8.31	4.93	6.67	8.52	8.03	8.59
22D	9.37	4.74	6.82	4.29	6.46	7.16	8.18	6.18
030	1.99	0.81	0.70	1.94	1.41	1.21	0.72	1.16
05F	1.92	1.06	0.93	2.39	1.57	1.81	1.59	1.49
06N1F	6.07	2.92	3.11	2.78	3.93	4.18	4.26	4.57
07N2F	8.75	4.89	3.94	3.67	5.03	5.68	6.07	5.39
08N3F	9.62	7.01	5.66	4.69	6.45	7.00	7.83	6.81
09N4F	9.03	7.81	7.52	5.10	6.51	7.08	8.07	7.64
10N2	7.44	2.91	2.40	2.24	3.39	3.39	2.90	2.96
11N2P	4.66	5.28	3.22	3.51	3.49	5.02	2.39	5.00
12N2PNA	5.96	5.08	3.21	3.02	5.11	3.67	3.37	5.66
13N2PK	8.05	4.15	3.37	2.87	5.34	5.31	6.55	5.35
14N2PKMG	8.29	4.08	3.59	2.84	5.30	5.55	6.59	5.99
15N5F	8.58	8.29	7.34	4.53	5.50	8.04	8.32	7.87
16N6F	8.32	7.96	7.72	4.79	4.85	7.59	8.00	7.64
17N1+3FN	9.09	7.48	7.22	3.43	6.41	7.52	8.21	7.62
18N0+3FN	9.44	7.27	6.64	2.67	6.71	7.34	8.03	7.57
19C	5.69	1.15	1.06	3.12	2.65	2.27	2.64	2.59
20NKMG	*	*	*	*	*	3.08	*	3.77

GRAIN MEAN DM% 87.5

**92/R/BK/1 W. WHEAT
STRAW TONNES/HECTARE**

***** Tables of means *****

SECTION	5/W1	1/W26
PLOT		
01DN4PK	8.26	*
21DN2	8.08	7.01
22D	9.37	3.95
030	0.96	0.16
05F	0.64	0.24
06N1F	3.51	1.52
07N2F	5.55	2.52
08N3F	5.48	3.43
09N4F	4.94	2.65
10N2	2.59	2.06
11N2P	1.74	2.13
12N2PNA	2.60	1.42
13N2PK	4.16	2.30
14N2PKMG	4.50	2.20
15N5F	4.77	3.52
16N6F	5.23	4.07
17N1+3FN	5.17	3.41
18N0+3FN	5.02	3.10
19C	2.95	0.40
20NKMG	*	1.67

STRAW MEAN DM% 82.4

CLEAN GRAIN TONNES/HECTARE, AFTER REMOVING WEED SEEDS

***** Tables of means *****

SECTION	8/W4
PLOT	
01DN4PK	*
21DN2	4.82
22D	3.82
030	1.57
05F	1.46
06N1F	2.50
07N2F	3.37
08N3F	4.52
09N4F	4.95
10N2	2.15
11N2P	3.42
12N2PNA	2.96
13N2PK	2.47
14N2PKMG	2.10
15N5F	4.41
16N6F	4.60
17N1+3FN	2.69
18N0+3FN	1.81
19C	2.80
20NKMG	*

92/R/BK/1 POTATOES

***** Tables of means *****

PLOT	TOTAL TUBERS	% WARE
	TONNES/ HECTARE	3.81 CM (1.5 INCH) RIDDLE
01DN4PK	54.0	97.7
21DN2	62.1	97.6
22D	56.5	98.7
030	10.6	92.7
05F	23.8	97.6
06N1F	25.1	95.7
07N2F	31.3	94.8
08N3F	34.1	96.9
09N4F	42.4	98.1
10N2	7.3	78.8
11N2P	7.3	78.2
12N2PNA	8.2	84.9
13N2PK	15.5	97.2
14N2PKMG	32.4	95.7
15N5F	36.5	97.0
16N6F	46.2	97.7
17N3FH	32.5	97.0
18N3FH	28.0	95.6
19C	15.1	95.1