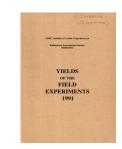
Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readible, or you suspect there are some problems, please let us know and we will correct that.



Yields of the Field Experiments 1991



Full Table of Content

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

Rothamsted Research

Rothamsted Research (1992) 91/R/BK/1 Broadbalk - W. Wheat, Potatoes; Yields Of The Field Experiments 1991, pp 9 - 13 - DOI: https://doi.org/10.23637/ERADOC-1-46

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 148th 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, and 74-90/R/BK/1.

Areas harvested:

| Wheat: | Section | |
|-----------|-------------|---------|
| | 0 | 0.00311 |
| | 1 | 0.00572 |
| | 2,4,6 and 7 | 0.00473 |
| | 8 and 9 | 0.00497 |
| Potatoes: | 5 | 0.00348 |

Treatments:

Whole plots

| PLOT | Fertilizers | and organic manures:- | |
|------------|------------------|-----------------------|------------------|
| | Treatments | Treatments | Treatments |
| P | lot until 1967 | from 1968 | from 1985 |
| 01DN4PK 0 | 1 - | D N2 P K | D N4 P K |
| 21DN2 2 | 1 D | D N2 | D N2 |
| 22D 2 | 2 D | D | D |
| 030 0 | None | None | None |
| 05F 0 | 5 PK Na Mg | P K (Na) Mg | PK Mg |
| 06N1F 0 | | | N1 P K Mg |
| 07N2F 0 | | | N2 P K Mg |
| 08N3F 0 | | N3 P K (Na) Mg | N3 P K Mg |
| 09N4F 0 | | N4 P K (Na) Mg | N4 P K Mg |
| 10N2 1 | .0 N2 | N2 | N2 |
| 11N2P 1 | 1 N2 P | N2 P | N2 P |
| 12N2PNA 1 | .2 N2 P Na | N2 P Na | N2 P Na |
| 13N2PK 1 | .3 N2 P K | N2 P K | N2 P K |
| 14N2PKMG 1 | | N2 P K Mg | N2 P K Mg |
| 15N5F 1 | | N3 P K (Na) Mg | |
| 16N6F 1 | .6 N*2 P K Na Mg | N2 P K (Na) Mg | N6 P K Mg |
| 17N0+3FH 1 | | N2 1/2(P K (Na) Mg) | |
| 18N1+3FH 1 | .8 P K Na Mg(A) | N2 1/2(P K (Na) Mg) | N1+3 1/2(PK Mg)+ |
| 19C 1 | .9 C | С | С |
| 20NKMG 2 | 0 N2 K Na Mg | N2 K (Na) Mg | N2 K Mg |

(A) Alternating

+ 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.)

NO+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 |
|----------|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 0/W40 | 0* | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W |
| 1/W25 | 1 | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W | W |
| 2/W3 | 2 | BE | W | P | BE | W | F | P | W | F | P | W | W | W | F | P | W | W | W |
| - | 3 | W | W | F | W | W | F | W | W | W | W | W | W | F | P | W | W | W | F |
| 4/W1 | 4 | W | P | BE | W | P | P | W | F | P | W | F | P | W | W | W | F | P | W |
| POTATOES | 5 | W | F | W | W | F | W | W | W | W | W | W | F | P | W | W | W | F | P |
| 6/W14 | 6** | F | W | W | F | W | W | W | W | W | W | W | W | W | W | W | W | W | W |
| 7/W2 | 7 | P | BE | W | P | BE | W | F | P | W | F | P | W | W | W | F | P | W | W |
| 8/W3 | 8+ | W | W | W | W | W | W | W | F | W | W | W | W | W | W | F | W | W | W |
| 9/W33 | 9 | 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.

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.

Standard applications:

- W. wheat: Manure: Chalk at 2.9 t (to sections 7 and 9 only). Weedkillers: Glyphosate at 1.4 kg in 200 l (except to sections 4 and 8). Diflufenican at 0.12 kg and isoproturon at 2.2 kg in 200 l (except to section 8). Glyphosate at 2.2 kg with a wetting agent, 'MAFF Adjuvant no. 0004' at 2.9 l, at 150 l (except to section 8). Fungicides (except to section 6): Prochloraz at 0.40 kg with the growth regulator in 200 l. Propiconazole at 0.12 kg with chlorothalonil at 0.50 kg in 200 l. Fenpropimorph at 0.75 kg in 200 l. Growth regulator (except to section 6): Chlormequat chloride at 1.6 kg.
- Potatoes: Weedkillers: Glyphosate at 1.4 kg in 200 l. Linuron at 1.6 kg in 200 l. Fungicides: Maneb at 0.96 kg and zinc oxide at 22 g in 200 l on three occasions, the first and third with a wetting agent, 'Bond' at 0.20 l, and the second occasion with pirimicarb. Mancozeb at 1.4 kg with a wetting agent, 'Bond' at 0.20 l, in 200 l. Fentin hydroxide at 0.27 kg with a wetting agent, 'Nu-film P' at 0.18 l, in 200 l. Insecticide: Pirimicarb at 0.14 kg.
- Fallow: Weedkiller: Glyphosate at 2.2 kg with a wetting agent, 'MAFF Adjuvant no. 0004' at 2.9 l, in 150 l.

Seed: W. wheat: Apollo, dressed fonofos, sown at 180 kg.
 Potatoes: Pentland Crown.

Cultivations, etc.:-

All Sections:

K, Na and Mg applied: 1 Oct, 1990. P applied: 2 Oct. FYM applied, ploughed and furrow pressed: 9 Oct. Rotary harrowed: 15 Oct.

Cropped Sections:

- W. wheat: Straw chopped (section 0): 14 Aug, 1990. Glyphosate alone applied (except to sections 4 and 8): 23 Aug. Chalk applied (sections 7 and 9): 27 Sept. Autumn N treatments applied: 2 Oct. Rotary harrowed, seed sown: 16 Oct. Diflufenican with isoproturon applied (except to section 8): 21 Nov. Spring N treatments applied: 9 Apr, 1991. Prochloraz with the growth regulator applied (except to section 6): 24 Apr. Propiconazole with chlorothalonil applied (except to section 6): 20 June. Fenpropimorph applied (except to section 6): 2 July. Glyphosate with the wetting agent applied (except to section 8): 12 Aug. Combine harvested: 25 Aug.
- Potatoes: Glyphosate applied: 11 Sept, 1990. Deep-tine cultivated: 14 Dec. N treatments applied: 9 Apr, 1991. Heavy spring-tine cultivated: 16 Apr. Rotary harrowed, potatoes planted: 17 Apr. Rotary ridged: 9 May. Linuron applied: 21 May. Maneb and zinc oxide with the wetting agent applied: 1 July and 22 July. Maneb and zinc oxide with the insecticide applied: 10 July. Mancozeb with the wetting agent applied: 1 Aug. Fentin hydroxide with the wetting agent applied: 12 Aug. Haulm mechanically destroyed: 28 Aug. Lifted: 24 Sept.
- Fallow: Deep-tine cultivated: 14 Dec, 1990. Heavy spring-tine cultivated: 25 Apr, 1991. Cultivated by rotary grubber: 21 June. Heavy spring-tine cultivated: 8 July. Glyphosate with wetting agent applied: 12 July.

91/R/BK/1 W.WHEAT

GRAIN TONNES/HECTARE

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

| SECTION PLOT | 4/W1 | 7/W2 | 2/W3 | 8/W3 | 6/W14 | 1/W25 | 9/W33 | 0/W40 |
|-----------------|------|------|------|------|-------|-------|-------|-------|
| 01DN4PK | 8.84 | 8.60 | 9.14 | * | 5.80 | * | * | * |
| 21DN2 | 9.38 | 8.65 | 8.84 | 3.31 | 7.18 | 8.98 | 9.10 | 8.74 |
| 22D | 7.80 | 5.69 | 6.17 | 3.60 | 5.38 | 5.98 | 6.87 | 5.50 |
| 030 | 1.62 | 0.67 | 0.79 | 1.75 | 1.12 | 1.25 | 0.96 | 1.00 |
| 05F | 1.50 | 0.52 | 0.85 | 2.10 | 1.17 | 1.29 | 1.09 | 1.51 |
| 06N1F | 4.84 | 3.14 | 2.92 | 2.54 | 3.32 | 3.39 | 3.78 | 3.37 |
| 07N2F | 6.92 | 5.42 | 5.07 | 3.27 | 5.75 | 6.29 | 6.19 | 5.82 |
| 08N3F | 7.96 | 7.96 | 6.88 | 5.00 | 7.09 | 7.80 | 7.76 | 7.21 |
| 09N4F | 8.35 | 8.43 | 7.39 | 5.63 | 6.95 | 7.65 | 8.21 | 7.34 |
| 10N2 | 5.63 | 4.85 | 3.29 | 1.76 | 3.54 | 3.14 | 4.00 | 3.11 |
| 11N2P | 4.60 | 5.40 | 4.31 | 2.11 | 3.25 | 4.36 | 1.85 | 3.67 |
| 12N2PNA | 5.32 | 5.67 | 3.92 | 2.32 | 4.31 | 2.85 | 2.22 | 4.51 |
| 13N2PK | 6.74 | 4.95 | 4.56 | 3.28 | 5.15 | 5.42 | 6.09 | 5.34 |
| 14N2PKMG | 6.72 | 5.27 | 4.69 | 2.86 | 5.14 | 5.77 | 6.20 | 5.67 |
| 15N5F | 8.51 | 8.96 | 7.85 | 3.89 | 6.97 | 8.66 | 8.84 | 7.89 |
| 16N6F | 8.26 | 8.50 | 8.21 | 3.77 | 6.28 | 8.16 | 8.22 | 7.32 |
| 17N0+3FH | 8.27 | 7.40 | 6.39 | 3.28 | 6.36 | 7.22 | 7.30 | 6.91 |
| 18N1+3FH | 8.38 | 7.81 | 7.25 | 4.33 | 6.62 | 7.28 | 7.38 | 7.42 |
| 19C | 3.19 | 0.84 | 1.04 | 2.51 | 1.64 | 2.02 | 1.76 | 1.90 |
| 20NKMG | * | * | * | * | * | 3.23 | * | 3.03 |

GRAIN MEAN DM% 82.7

STRAW TONNES/HECTARE

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

| 4/W1 | 1/W25 |
|------|--|
| | |
| 9.02 | * |
| 9.11 | 8.67 |
| 7.24 | 4.58 |
| 1.11 | 1.06 |
| 0.90 | 0.92 |
| 3.27 | 3.01 |
| 5.54 | 4.75 |
| 6.56 | 5.56 |
| 6.60 | 5.90 |
| 3.04 | 3.78 |
| 2.96 | 2.93 |
| 3.37 | 1.68 |
| 5.57 | 4.38 |
| 5.86 | 3.98 |
| 7.54 | 6.78 |
| 7.05 | 6.34 |
| 6.68 | 5.95 |
| 6.83 | 6.46 |
| 1.48 | 1.52 |
| * | 3.44 |
| | 9.02 9.11 7.24 1.11 0.90 3.27 5.54 6.56 6.60 3.04 2.96 3.37 5.57 5.86 7.54 7.05 6.68 6.83 1.48 |

STRAW MEAN DM% 89.8

POTATOES

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

| PLOT | TOTAL TUBERS TONNES/ HECTARE | % WARE 3.81 CM (1.5 INCH) RIDDLE |
|----------|------------------------------------|--|
| 01DN4PK | 41.9 | 93.4 |
| 21DN2 | 45.7 | 95.6 |
| 22D | 34.2 | 93.0 |
| 030 | 5.5 | 62.6 |
| 05F | 10.6 | 78.0 |
| 06N1F | 23.3 | 88.8 |
| 07N2F | 29.2 | 88.8 |
| 08N3F | 32.8 | 91.3 |
| 09N4F | 29.7 | 91.4 |
| 10N2 | 8.7 | 78.2 |
| 11N2P | 10.0 | 77.8 |
| 12N2PNA | 9.8 | 73.2 |
| 13N2PK | 18.3 | 75.9 |
| 14N2PKMG | 31.1 | 90.6 |
| 15N5F | 37.9 | 90.7 |
| 16N6F | 35.3 | 93.2 |
| 17N3FH | 22.1 | 89.5 |
| 18N3FH | 27.1 | 92.5 |
| 19C | 16.0 | 88.9 |