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## Broadbalk Wheat Experiment plan and cropping 1926-1967

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**Prepared by:** Glendining, M.J., Rothamsted Research, Harpenden, Herts, AL5 2JQ, UK

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**Date:** October 2017, revised June 2021 with addition of cropping details.

**Description:** Experiment plan for the Broadbalk Wheat Experiment, 1926-1967, with details of fertilizer and manure treatments (not to scale). Also cropping details 1926-1967.

- **Page 1:** Cover page
- **Pages 2-3:** Broadbalk Wheat Experiment plan 1926-1967, showing plot layout and treatment codes, with full details of fertilizer and manure treatments applied.
- **Pages 4-5:** Broadbalk Wheat Experiment cropping details 1926-1967, showing wheat cultivars, wheat/fallow rotations and the different sections.

**Site:** R/BK/1. Broadbalk field, Rothamsted Experimental Farm, Rothamsted Research, West Common, Harpenden, Hertfordshire, AL5 2JQ, UK. Latitude 51.80946, Longitude -0.37301

### Derived from:

- Johnston, A.E. & Garner, H.V. (1969) *The Broadbalk Wheat Experiment 2. Historical Introduction*. Rothamsted Report for 1968, part 2, pp12-25. [10.23637/ERADOC-1-34916](https://doi.org/10.23637/ERADOC-1-34916)
- Rothamsted Experimental Station (1970) *Details of the Classical and Long-Term Experiments up to 1967*, Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK, 128pp [10.23637/ERADOC-1-192](https://doi.org/10.23637/ERADOC-1-192)

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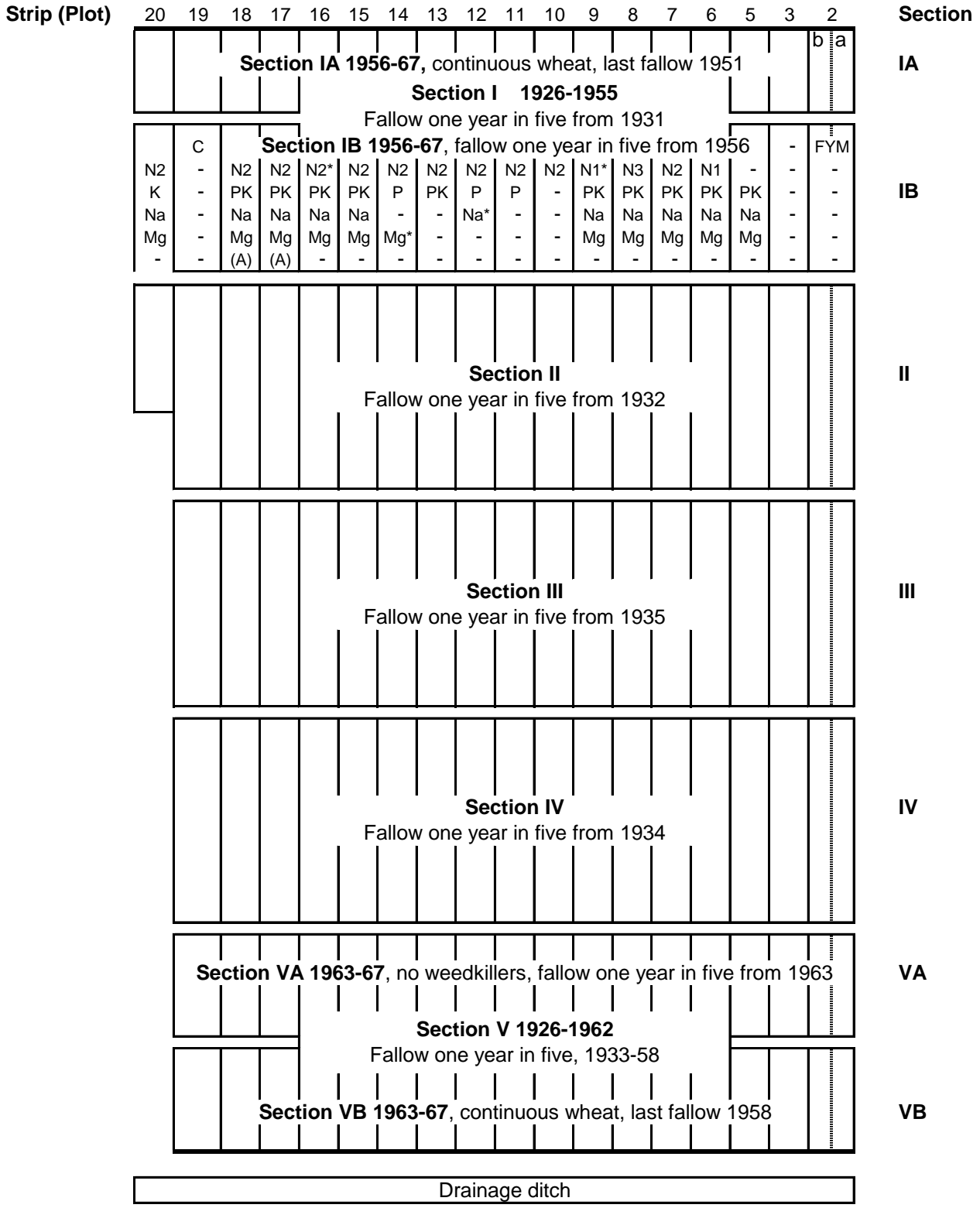
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# BROADBALK PLAN 1926-1967



## Fertilizer and organic manure treatments 1926-1967

### Strip Treatments applied each year (since 1852)

- 2a FYM since 1885 (called 2.1 1968 onwards)
- 2b FYM (called 2.2 1968 onwards)
- 3 No fertilizer or manure
- 5 PKNaMg
- 6 N1 PKNaMg
- 7 N2 PKNaMg
- 8 N3 PKNaMg
- 9 N1\* PKNaMg since 1894; 9A and 9B received different treatments 1852-93
- 10 N2
- 11 N2 P
- 12 N2 P Na\*
- 13 N2 PK
- 14 N2 P Mg\*
- 15 N2 PKNaMg (timing of N application different to other plots, see below)
- 16 N4 PKNaMg 1852-64; unmanured 1865-83; N2\*PKNaMg since 1884
- (A) Plots 17 and 18 treatments alternate each year:
  - 17 N2 applied in even years; PKNaMg applied in odd years
  - 18 N2 applied in odd years; PKNaMg applied in even years
- 19 C: rape cake 1879-1940; castor bean meal since 1941  
N1.5 P and rape cake 1852-78
- 20 N2 KNaMg since 1906, previously no manure or fertilizer

### Annual treatment per hectare:

- FYM: Farmyard manure at 35t
- C: Rape cake 1926-1940, supplying approx. 96kgN (N2).  
Castor bean meal 1941-1967, supplying approx. 96 kgN (N2)
- P: 35 kgP as superphosphate
- K: 90 kgK as potassium sulphate
- Na: 16 kgNa as sodium sulphate
- Na\* 57 kgNa as sodium sulphate
- Mg: 11 kgMg as magnesium sulphate
- Mg\* 31 kgMg as magnesium sulphate

### Nitrogen: Annual treatment per hectare

- N1: 48 kgN as ammonium sulphate
- N1.5 72 kgN as ammonium sulphate
- N2: 96 kgN as ammonium sulphate
- N3: 144 kgN as ammonium sulphate
- N4: 192 kgN as ammonium sulphate
- N1\*: 48 kgN as sodium nitrate
- N2\*: 96 kgN as sodium nitrate

### Timing of Nitrogen applications:

Ammonium sulphate:

- 1852-72 All applied in autumn
- 1873-77 All applied in autumn, except plot 15 in spring
- 1878-83 All applied in spring, except plot 15 in autumn
- 1884-1967 24 kgN applied in autumn, remainder in spring (except plot 15 all in autumn)

Sodium nitrate (N\*):

- 1867-1967 All applied in spring, as one application, except N2 (plot 16) applied as two equal amounts since 1899, applied from six days to six weeks apart

## Broadbalk Cropping 1926 - 1967

### Old section number <sup>a</sup>

| Winter Wheat Cultivar | Harvest Year | I  | II | III | IV  | V  |    |    |
|-----------------------|--------------|----|----|-----|-----|----|----|----|
| Red Standard          | 1926         | F  | F  | F   | W   | W  |    |    |
| Red Standard          | 1927         | F  | F  | F   | W   | W  |    |    |
| Red Standard          | 1928         | W  | W  | F   | F   | F  |    |    |
| Squarehead's Master   | 1929         | W  | W  | F   | F   | F  |    |    |
| Red Standard          | 1930         | W  | W  | W   | W   | W  |    |    |
| Red Standard          | 1931         | F  | W  | W   | W   | W  |    |    |
| Red Standard          | 1932         | W  | F  | W   | W   | W  |    |    |
| Red Standard          | 1933         | W  | W  | W   | W   | F  |    |    |
| Red Standard          | 1934         | W  | W  | W   | F   | W  |    |    |
| Red Standard          | 1935         | W  | W  | F   | W   | W  |    |    |
| Red Standard          | 1936         | F  | W  | W   | W   | W  |    |    |
| Red Standard          | 1937         | W  | F  | W   | W   | W  |    |    |
| Red Standard          | 1938         | W  | W  | W   | W   | F  |    |    |
| Red Standard          | 1939         | W  | W  | W   | F   | W  |    |    |
| Squarehead's Master   | 1940         | W  | W  | F   | W   | W  |    |    |
| Squarehead's Master   | 1941         | F  | W  | W   | W   | W  |    |    |
| Stand up              | 1942         | W  | F  | W   | W   | W  |    |    |
| Squarehead's Master   | 1943         | W  | W  | W   | W   | F  |    |    |
| Red Standard          | 1944         | W  | W  | W   | F   | W  |    |    |
| Red Standard          | 1945         | W  | W  | F   | W   | W  |    |    |
| Squarehead's Master   | 1946         | F  | W  | W   | W   | W  |    |    |
| Squarehead's Master   | 1947         | W  | F  | W   | W   | W  |    |    |
| Squarehead's Master   | 1948         | W  | W  | W   | W   | F  |    |    |
| Squarehead's Master   | 1949         | W  | W  | W   | F   | W  |    |    |
| Squarehead's Master   | 1950         | W  | W  | F   | W   | W  |    |    |
| Squarehead's Master   | 1951         | F  | W  | W   | W   | W  |    |    |
| Squarehead's Master   | 1952         | W  | F  | W   | W   | W  |    |    |
| Squarehead's Master   | 1953         | W  | W  | W   | W   | F  |    |    |
| Squarehead's Master   | 1954         | W  | W  | W   | F   | W  |    |    |
| Section number:       |              | IA | IB | II  | III | IV | VA | VB |
| Squarehead's Master   | 1955         | W  | W  | W   | F   | W  | W  | W  |
| Squarehead's Master   | 1956         | W  | F  | W   | W   | W  | W  | W  |
| Squarehead's Master   | 1957         | W  | W  | F   | W   | W  | W  | W  |
| Squarehead's Master   | 1958         | W  | W  | W   | W   | W  | F  | F  |
| Squarehead's Master   | 1959         | W  | W  | W   | W   | F  | W  | W  |
| Squarehead's Master   | 1960         | W  | W  | W   | F   | W  | W  | W  |
| Squarehead's Master   | 1961         | W  | F  | W   | W   | W  | W  | W  |
| Squarehead's Master   | 1962         | W  | W  | F   | W   | W  | W  | W  |
| Squarehead's Master   | 1963         | W  | W  | W   | W   | W  | F  | W  |
| Squarehead's Master   | 1964         | W  | W  | W   | W   | F  | W  | W  |
| Squarehead's Master   | 1965         | W  | W  | W   | F   | W  | W  | W  |
| Squarehead's Master   | 1966         | W  | F  | W   | W   | W  | W  | W  |
| Squarehead's Master   | 1967         | W  | W  | F   | W   | W  | W  | W  |

1968 onwards, becomes new section number:

0    1    2    3    4    5    6    7    8    9

W=winter wheat, F=fallow (no crop)

Harvest year refers to the year in which the crop was harvested.

<sup>a</sup> **1926:** Experiment divided into five sections (I-V) to allow sequential fallowing to control weeds.

**1955:** Section I divided into IA and IB. IA received herbicides and was no longer fallowed, section IB continued the 5 year cycle of wheat and fallow.

Section V divided into VA and VB. VB received a single application of lime, VA did not.

**1963:** Section VB no longer fallowed, and received herbicides as required;

section VA continued with the 5 year wheat and fallow cycle.

**1968:** Divided to make 10 'New' sections, 0-9

**Seed:** New seed was bought each year up to 1963. From 1963 saved seed from the previous Broadbalk crop (bulked from several plots and well mixed) was sown.