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## Yields of the Field Experiments 1996

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### 96/W/WW/1 Variety, Sulphur and Nitrogen - W. Wheat

#### Rothamsted Research

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# WINTER WHEAT

## VARIETY, SULPHUR AND NITROGEN

**Object:** To measure yield and quality response to sulphur fertilizer on two varieties of wheat - Woburn, Stackyard AI.

**Sponsors:** S.P. McGrath, F. Zhao.

**Design:** 3 randomised blocks of (2 x 6) + 6 plots

**Plot dimensions:** 3.0 x 10.0.

**Treatments:** All combinations of:-

1. **NITROGEN** Nitrogen fertilizer (kg N) as 34.5% N at growth stage 32 in addition to a basal dressing of 180 kg N:

|    |      |
|----|------|
| N1 | None |
| N2 | 50   |

2. **SULPHUR** Sulphur fertilizer (kg S) as gypsum (17.5% S) at growth stage 23:

|    |     |
|----|-----|
| S0 | 0   |
| S1 | 10  |
| S2 | 20  |
| S3 | 40  |
| S4 | 70  |
| S5 | 100 |

plus 6 extra plots

3. **EXTRA** Variety, timing (growth stage (GS)) and rates of nitrogen fertilizer as urea (kg N), sulphur as ammonium sulphate or gypsum (kg S):

|      | Variety  | N as<br>urea | S as<br>(NH <sub>4</sub> )SO <sub>4</sub> | S as<br>gypsum | Timing<br>(GS)       |
|------|----------|--------------|-------------------------------------------|----------------|----------------------|
| EUS0 | Hereward | 50.0         | 0                                         | 0              | 65                   |
| EUS1 | Hereward | 41.2         | 10                                        | 0              | 65                   |
| EUS2 | Hereward | 32.6         | 20                                        | 0              | 65                   |
| EUS3 | Hereward | 32.6         | 20                                        | 20             | 65 (gypsum at GS 23) |
| RNS0 | Riband   | 0            | 0                                         | 0              | -                    |
| RNS2 | Riband   | 0            | 0                                         | 20             | 23                   |

**NOTE:** All treatments were sown to variety Hereward, except RNS0 and RNS2 which were sown to Riband.

### Experimental diary:

14-Sep-95 : B : Ploughed.  
23-Sep-95 : B : Rolled.  
05-Oct-95 : B : Rotary harrowed.

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**Experimental diary:**

05-Oct-95 : T : All plots except RNS0, RNS2: Hereward, dressed Sibutol, drilled at 375 seeds per m<sup>2</sup>.  
          : T : **EXTRA** RNS0, RNS2: Riband, dressed Sibutol, drilled at 375 seeds per m<sup>2</sup>.  
13-Nov-95 : B : Panther at 2.0 l in 200 l.  
08-Mar-96 : B : 34.5% N at 116 kg.  
11-Mar-96 : T : **SULPHUR** S1-S5, **EXTRA** EUS3, RNS2: Gypsum applied.  
16-Apr-96 : B : 34.5% N at 406 kg.  
30-Apr-96 : B : Halo at 1.5 l in 200 l.  
02-May-96 : T : **NITROGEN** N2: 34.5% N at 145 kg.  
06-Jun-96 : B : Silvacur at 1.0 l in 300 l.  
10-Jul-96 : T : **EXTRA** EUS0, EUS1, EUS2, EUS3: Urea applied.  
          : T : **EXTRA** EUS1, EUS2, EUS3: Ammonium sulphate applied.  
18-Jul-96 : T : **EXTRA** EUS0, EUS1, EUS2, EUS3: Urea applied.  
          : T : **EXTRA** EUS1, EUS2, EUS3: Ammonium sulphate applied.  
19-Aug-96 : B : Combine harvested.

**NOTE:** Plants were sampled monthly April to August for nitrogen and sulphur content. Grain was analysed for nitrogen and sulphur content and bread making quality. Soils were sampled in autumn, spring and at harvest for sulphur content.

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GRAIN TONNES/HECTARE

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

| SULPHUR<br>NITROGEN | S0   | S1   | S2   | S3   | S4   | S5   | Mean |
|---------------------|------|------|------|------|------|------|------|
| N1                  | 6.24 | 7.43 | 6.71 | 6.86 | 6.32 | 6.76 | 6.72 |
| N2                  | 7.13 | 6.47 | 7.02 | 6.68 | 6.27 | 7.07 | 6.77 |
| Mean                | 6.68 | 6.95 | 6.86 | 6.77 | 6.30 | 6.91 | 6.74 |
| EXTRA               | EUS0 | EUS1 | EUS2 | EUS3 | RNS0 | RNS2 | Mean |
|                     | 6.52 | 7.08 | 6.30 | 7.14 | 7.87 | 8.19 | 7.18 |

Grand mean 6.89

\*\*\* Standard errors of differences of means \*\*\*

| NITROGEN | SULPHUR | NITROGEN<br>SULPHUR<br>& EXTRA |
|----------|---------|--------------------------------|
| 0.212    | 0.367   | 0.519                          |

\*\*\*\*\* Stratum standard errors and coefficients of variation \*\*\*\*\*

| Stratum  | d.f. | s.e.  | cv% |
|----------|------|-------|-----|
| BLOCK.WP | 34   | 0.636 | 9.2 |

GRAIN MEAN DM% 90.1

PLOT AREA HARVESTED 0.00176