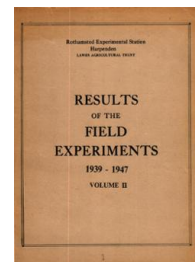


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# Yields of the Field Experiments 1939-1947 Volume 2

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## K Wheat and Spring Sown Cereals

### Rothamsted Research

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K/1

## WHEAT

Observations on the incidence of *Cercospora herpotrichoides* Fron. (Eyespot), and other diseases and pests, were taken on all wheat experiments, of which some were ordinary variety and fertilizer trials and some were specially laid down to test the effects of various treatments for the control of Eyespot.

The figures for percentage Eyespot infection are transformed to degrees for the purpose of analysis, and the mean percentages shown are derived from the transformed data.

### Pennell's Piece and West Barnfield, 1941

Effects of rates and times of application of sulphate of ammonia on yield and extent of lodging of three varieties of wheat.

Design: 3 randomized blocks of 3 plots each, the plots being split into 3 for different rates and times of application of fertilizer, with confounding according to a Greco-Latin design.

Area of each sub-plot: Pennell's Piece, 0.0667 acre;  
W. Barnfield 0.0250 acre.

### Treatments

Varieties; Desprez 80, Wilma, Red Standard

Sulphate of ammonia; 0.0, 0.3, 0.6 cwt. N per acre

Times of application of S/A; Early (early March), half early and half late, and late (middle May).

### Crop Notes

|               | Pennell's Piece | West Barnfield |
|---------------|-----------------|----------------|
| Sown          | Oct. 26         | Nov. 27        |
| Harvested     | Aug. 21         | Sept. 1        |
| Previous crop | Wheat           | Spring oats    |

A third experiment of the same type was carried out at Woburn, but on account of bird damage and other causes, yields were very irregular; experimental errors were too high to allow any reliable results to be presented.

K/2

Wheat - Pennell's Piece and W. Barnfield, 1941

| Pennell's Piece                 |               |                          |              |      |
|---------------------------------|---------------|--------------------------|--------------|------|
| Variety                         | Desprez<br>80 | Wilma                    | Red Standard | Mean |
| Grain, cwt. per acre $\pm 0.65$ | 18.4          | 15.0                     | 14.4         | 15.9 |
| Straw, cwt. per acre $\pm 1.13$ | 30.4          | 34.3                     | 37.6         | 34.1 |
| % Lodging in August             | 4             | 23                       | 49           | 25   |
| Percentage Eyespot at harvest   | 76            | 76                       | 85           | 79   |
| Cwt. N. per acre                | 0.0           | 0.3                      | 0.6          | Mean |
| Grain, cwt. per acre $\pm 0.65$ | 11.9          | 16.3                     | 19.7         | 15.9 |
| Straw, cwt. per acre $\pm 1.13$ | 26.5          | 34.0                     | 41.7         | 34.1 |
| % Lodging in August             | 22            | 20                       | 34           | 25   |
| Percentage Eyespot at harvest   | 79            | 81                       | 79           | 79   |
| Nitrogen applied                | Early         | Half early,<br>half late | Late         | Mean |
| Grain, cwt. per acre $\pm 0.65$ | 15.8          | 16.4                     | 15.6         | 15.9 |
| Straw, cwt. per acre $\pm 1.13$ | 35.3          | 33.8                     | 33.1         | 34.1 |
| % Lodging in August             | 36            | 18                       | 21           | 25   |
| Percentage Eyespot at harvest   | 83            | 79                       | 75           | 79   |

Standard errors per plot (pooled whole-plot and sub-plot errors)

|       |                                      |
|-------|--------------------------------------|
| Grain | 1.95 cwt. per acre or 12.2%, 14 d.f. |
| Straw | 3.39 cwt. per acre or 10.0%, 14 d.f. |

K/3

## West Barnfield

| Variety                         | Desprez<br>80 | Wilma                    | Red Standard | Mean |
|---------------------------------|---------------|--------------------------|--------------|------|
| Grain, cwt. per acre $\pm 0.88$ | 27.0          | 27.4                     | 23.2         | 25.8 |
| Straw, cwt. per acre $\pm 1.77$ | 30.6          | 36.5                     | 34.5         | 33.9 |
| % Lodging in August             | 0             | 34                       | 72           | 35   |
| Percentage Eyespot at harvest   |               | None                     |              |      |
| Cwt. N per acre                 | 0.0           | 0.3                      | 0.6          | Mean |
| Grain, cwt. per acre $\pm 0.88$ | 24.7          | 26.7                     | 26.0         | 25.8 |
| Straw, cwt. per acre $\pm 1.77$ | 30.6          | 34.1                     | 37.0         | 33.9 |
| % Lodging in August             | 28            | 37                       | 41           | 35   |
| Percentage Eyespot at harvest   |               | None                     |              |      |
| Nitrogen applied                | Early         | Half early,<br>half late | Late         | Mean |
| Grain, cwt. per acre $\pm 0.88$ | 25.2          | 26.2                     | 26.2         | 25.8 |
| Straw, cwt. per acre $\pm 1.77$ | 34.4          | 34.0                     | 33.1         | 33.9 |
| % Lodging in August             | 36            | 34                       | 36           | 35   |
| Percentage Eyespot at harvest   |               | None                     |              |      |

Standard errors per plot (pooled whole plot and sub-plot errors)

Grain 2.63 cwt. per acre or 10.2%, 13 d.f.

Straw 5.31 cwt. per acre or 15.7%, 13 d.f.

K/4

## WHEAT

Pennell's Piece, 1942

Effects of two rates of application of sulphate of ammonia to ten varieties of wheat.

Design; 4 randomized blocks of 10 plots each, the plots being split into two for rate of application of fertilizer.

Area of each plot; Plots of varying sizes in the different blocks, from 0.004 to 0.006 acre per sub-plot.

### Treatments

Varieties; Red Standard, Desprez 80, Rampton Rivett, Steadfast, Holdfast, Garton's 60, Juliana, Little Joss, Cotes d'Or, Vilmorin.

Sulphate of ammonia; 0.4, 0.8 cwt. N per acre.

Basal Manuring; 3 cwt. per acre superphosphate.

### Crop Notes

Sown; Nov. 27. Harvested; Aug. 17.

Previous crop; Wheat.

K/5

| Variety        | Grain: cwt. per acre |                   | Straw: cwt. per acre |               |
|----------------|----------------------|-------------------|----------------------|---------------|
|                | Mean                 | Response to N     | Mean                 | Response to N |
|                | $\pm 1.14$           | $\pm 1.60$        |                      |               |
| Red Standard   | 25.9                 | -0.6              | 46.2                 | 3.6           |
| Desprez 80     | 32.5                 | 4.3               | 43.6                 | 7.9           |
| Rampton Rivett | 26.6                 | 4.1               | 60.3                 | -2.6          |
| Steadfast      | 27.1                 | 1.5               | 45.4                 | 6.9           |
| Holdfast       | 27.8                 | 6.3               | 45.4                 | 9.2           |
| Garton's 60    | 27.3                 | 1.4               | 40.8                 | -0.7          |
| Juliana        | 30.1                 | 1.7               | 48.5                 | 3.8           |
| Little Joss    | 25.0                 | 1.2               | 48.2                 | -0.5          |
| Cotes d'Or     | 27.1                 | 2.3               | 44.8                 | 6.0           |
| Vilmorin       | 33.2                 | 3.2               | 55.4                 | 9.5           |
| Mean           | 28.3                 | 2.5<br>$\pm 0.51$ | 47.9                 | 4.3           |

|                | Percentage Eyespot Transformed |                    | Percentage Eyespot |               |
|----------------|--------------------------------|--------------------|--------------------|---------------|
|                | Mean                           | Response to N      | Mean               | Response to N |
|                | $\pm 2.33$                     | $\pm 4.41$         |                    |               |
| Red Standard   | 26.5                           | 2.2                | 20                 | 3             |
| Desprez 80     | 21.9                           | -2.6               | 14                 | -4            |
| Rampton Rivett | 20.2                           | -5.6               | 12                 | -6            |
| Steadfast      | 21.4                           | -4.4               | 13                 | -5            |
| Holdfast       | 29.2                           | 0.4                | 24                 | 0             |
| Garton's 60    | 24.4                           | -3.1               | 17                 | -4            |
| Juliana        | 27.0                           | -6.9               | 21                 | -10           |
| Little Joss    | 25.2                           | -4.8               | 18                 | -6            |
| Cotes d'Or     | 27.1                           | 3.6                | 21                 | 5             |
| Vilmorin       | 21.4                           | -3.6               | 13                 | -5            |
| Mean           | 24.4                           | -2.5<br>$\pm 1.39$ | 17                 | -3            |

## Standard errors per Plot:

Grain, per whole plot, 2.28 cwt. per acre or 8.1%, 27 d.f.  
 per sub-plot, 2.27 cwt. per acre or 8.0%, 28 d.f.

## Transformed Percent: Eyespot

per whole plot, 4.66, 27 d.f.  
 per sub-plot, 6.24, 28 d.f.

K/6

WHEAT  
Foster's 1943

Effect on the yield and Eyespot infection of sulphuric acid spraying on four varieties, sulphate of ammonia applied in early and late spring, and time of sowing.

Design; 8 randomized blocks of 8 plots each, the plots being split in half for applications of sulphate of ammonia. Spraying effects and certain high-order interactions confounded with block differences.

Area of each sub-plot; 0.0125 acre.

Treatments

On blocks; Untreated, sprayed with sulphuric acid (100 gallons per acre 10% B.O.V.) immediately after second sowing date and before emergence of plants (S), sprayed with sulphuric acid as above after raking off stubble (RS), inoculated with stubble raked off blocks receiving the RS treatment (I).

On plots;

Varieties: Red Standard (R), Juliana (W), Vilmorin (V), Desprez 80 (D).

Time of sowing: Early (Oct.), late (Nov.)

On sub-plots;

Sulphate of ammonia: None, 0.6 cwt. N per acre

Time of application of S/A: Early spring (E), late spring (L), half early and half late (EL).

Crop Notes

Stubble raked off RS plots and spread on I plots, Sept. 17.

Seed sown, Oct. 9 or Nov. 13. Harvested: Aug. 6

Previous crop: Barley.

Standard errors per plot:

Grain: Per block, 1.86 cwt. per acre or 10.5%, 4 d.f.  
per whole plot, 1.58 cwt. per acre or 9.0%, 27 d.f.  
per sub-plot, 1.41 cwt. per acre or 8.0%, 18 d.f.

Straw: Per block, 0.81 cwt. per acre or 3.3%, 4 d.f.  
per whole plot, 2.42 cwt per acre or 9.9%, 27 d.f.  
per sub-plot, 2.38 cwt. per acre or 9.8%, 18 d.f.

Transformed Percent. Eyespot: per block 2.22, 4 d.f.  
per whole plot, 4.58, 27 d.f.  
per sub-plot, 11.67, 18 d.f.

K/7

| Grain, cwt. per acre     |            |      |            |      |      |            |         |      |      |      |
|--------------------------|------------|------|------------|------|------|------------|---------|------|------|------|
|                          | Mean       | R    | Variety    |      |      | Late-Early |         |      |      |      |
|                          |            |      | W          | V    | D    | Sowing     | O       | I    | S    | RS   |
|                          | (a)&(b)    |      | (c)&(d)    |      |      | (c)&(d)    | (c)&(d) |      |      |      |
| O                        | 14.0       | 14.2 | 13.9       | 13.2 | 14.9 | -0.7       | 12.6    | 13.1 | 14.6 | 15.9 |
| E                        | 20.0       | 19.8 | 18.1       | 20.9 | 21.3 | -1.3       | 18.3    | 18.3 | 22.2 | 21.4 |
| L                        | 17.4       | 17.8 | 17.3       | 16.7 | 17.7 | -0.1       | 14.8    | 16.9 | 18.2 | 19.7 |
| EL                       | 19.2       | 20.6 | 17.8       | 18.0 | 20.5 | -2.0       | 16.3    | 19.2 | 19.7 | 21.6 |
|                          |            |      | $\pm 0.40$ |      |      | $\pm 0.40$ |         |      |      |      |
| Mean                     | 17.7       | 18.1 | 16.8       | 17.2 | 18.6 | -1.0       |         |      |      |      |
| Late-<br>Early<br>Sowing |            |      | $\pm 0.79$ |      |      |            |         |      |      |      |
|                          |            | 0.0  | -2.4       | -0.6 | -1.0 |            |         |      |      |      |
|                          | $\pm 1.32$ |      | $\pm 0.79$ |      |      | $\pm 0.79$ |         |      |      |      |
| O                        | 15.5       | 16.7 | 14.8       | 14.5 | 16.0 | -0.3       |         |      |      |      |
| I                        | 16.9       | 18.6 | 15.0       | 15.3 | 18.5 | -0.8       |         |      |      |      |
| S                        | 18.7       | 18.4 | 17.8       | 18.5 | 19.9 | -1.7       |         |      |      |      |
| RS                       | 19.6       | 18.5 | 19.5       | 20.6 | 19.9 | -1.3       |         |      |      |      |

(a) 0.25 (c) 0.50 for use in comparisons of E v. L and O v. EL only  
(b) 0.98 (d) 1.95 for use in all other within-block comparisons

| Straw, cwt. per acre     |            |      |            |      |      |            |         |      |      |      |
|--------------------------|------------|------|------------|------|------|------------|---------|------|------|------|
|                          | Mean       | R    | W          | V    | D    | Late-Early |         |      |      |      |
|                          |            |      |            |      |      | Sowing     | O       | I    | S    | RS   |
|                          | (a)&(b)    |      | (c)&(d)    |      |      | (c)&(d)    | (c)&(d) |      |      |      |
| O                        | 18.5       | 20.3 | 18.9       | 16.4 | 18.7 | -0.3       | 19.2    | 17.7 | 18.3 | 19.1 |
| E                        | 30.0       | 32.8 | 29.4       | 29.4 | 28.3 | -1.3       | 30.3    | 27.7 | 30.7 | 31.1 |
| L                        | 22.1       | 23.7 | 22.6       | 20.8 | 21.2 | -0.2       | 20.2    | 22.0 | 22.3 | 23.7 |
| EL                       | 26.8       | 31.6 | 24.9       | 24.1 | 26.5 | -2.5       | 25.3    | 27.3 | 26.0 | 28.6 |
|                          |            |      | $\pm 0.60$ |      |      | $\pm 0.60$ |         |      |      |      |
| Mean                     | 24.3       | 27.1 | 23.9       | 22.7 | 23.7 | -1.1       |         |      |      |      |
| Late-<br>Early<br>Sowing |            |      | $\pm 1.21$ |      |      |            |         |      |      |      |
|                          |            | -1.5 | -1.4       | -0.6 | -1.0 |            |         |      |      |      |
|                          | $\pm 0.57$ |      | $\pm 1.21$ |      |      | $\pm 1.21$ |         |      |      |      |
| O                        | 23.8       | 28.3 | 23.5       | 21.2 | 22.0 | -1.5       |         |      |      |      |
| I                        | 23.7       | 27.4 | 21.2       | 21.7 | 24.4 | -1.4       |         |      |      |      |
| S                        | 24.3       | 25.8 | 24.5       | 23.2 | 23.7 | -1.0       |         |      |      |      |
| RS                       | 25.6       | 26.8 | 26.5       | 24.6 | 24.7 | -0.6       |         |      |      |      |

Standard Errors  
(a) 0.42 (c) 0.84 for use in vertical comparisons of E v. L and O v. EL only.  
(b) 0.59 (d) 1.18 for use in all other within-block comparisons

Standard errors shown for the block treatments O, I, S, RS are for use in within-block comparisons, except for the S.E.'s shown for the means of these treatments.

K/8

## Wheat - Foster's 1943

| Transformed Percentage Eyespot |            |      |            |      |      |                      |                            |      |      |      |
|--------------------------------|------------|------|------------|------|------|----------------------|----------------------------|------|------|------|
|                                | Mean       | R    | Variety    |      |      | Late-Early<br>Sowing | O                          | I    | S    | RS   |
|                                | (a)&(b)    |      | (c)&(d)    |      |      | (c)&(d)              | (c)&(d)                    |      |      |      |
| O                              | 49.2       | 52.7 | 49.6       | 49.4 | 45.2 | 2.1                  | 51.9                       | 49.3 | 46.8 | 49.0 |
| E                              | 53.7       | 55.0 | 55.0       | 53.1 | 51.6 | 1.4                  | 55.5                       | 54.4 | 50.7 | 54.1 |
| L                              | 50.5       | 51.0 | 49.8       | 48.1 | 53.2 | 1.0                  | 54.0                       | 48.9 | 49.7 | 49.5 |
| EL                             | 52.2       | 56.0 | 53.4       | 50.6 | 48.8 | 3.0                  | 54.8                       | 52.7 | 49.1 | 52.2 |
|                                |            |      | $\pm 1.15$ |      |      | $\pm 1.15$           |                            |      |      |      |
| Mean                           | 51.4       | 53.7 | 52.0       | 50.3 | 49.7 | 1.8                  |                            |      |      |      |
| Late-<br>Early<br>Sowing       |            |      | $\pm 2.29$ |      |      |                      |                            |      |      |      |
|                                |            | 3.4  | 2.1        | 1.4  | 0.6  |                      |                            |      |      |      |
|                                | $\pm 1.57$ |      | $\pm 2.29$ |      |      | $\pm 2.29$           | Standard errors            |      |      |      |
| O                              | 54.1       | 59.4 | 52.6       | 52.9 | 51.4 | -0.1                 | (a) 2.06 (c) 4.12 for use  |      |      |      |
| I                              | 51.3       | 52.6 | 53.0       | 49.4 | 50.3 | 0.2                  | in vertical comparisons    |      |      |      |
| S                              | 49.1       | 50.8 | 49.8       | 48.4 | 47.4 | 3.1                  | of E v. L and O v. EL only |      |      |      |
| RS                             | 51.2       | 52.0 | 52.5       | 50.6 | 49.7 | 4.1                  | (b) 1.38 (d) 2.75 for use  |      |      |      |
|                                |            |      |            |      |      |                      | in all other within -block |      |      |      |
|                                |            |      |            |      |      |                      | comparisons                |      |      |      |

## Percentage Eyespot

|                          | Mean | R    | W    | V    | D    | Late-Early<br>Sowing | O    | I    | S    | RS   |
|--------------------------|------|------|------|------|------|----------------------|------|------|------|------|
| O                        | 57.3 | 63.3 | 58.0 | 57.7 | 50.3 | 3.6                  | 62.0 | 57.5 | 53.2 | 57.0 |
| E                        | 65.0 | 67.1 | 67.1 | 64.0 | 61.4 | 2.4                  | 67.9 | 66.2 | 59.8 | 65.7 |
| L                        | 59.5 | 60.3 | 58.3 | 55.4 | 64.2 | 1.6                  | 65.5 | 56.8 | 58.2 | 57.8 |
| EL                       | 62.5 | 68.7 | 64.5 | 59.7 | 56.7 | 5.2                  | 66.8 | 63.3 | 57.2 | 62.5 |
| Mean                     | 61.0 | 65.0 | 62.2 | 59.2 | 58.2 | 3.2                  |      |      |      |      |
| Late-<br>Early<br>Sowing |      | 5.5  | 3.6  | 2.3  | 1.0  |                      |      |      |      |      |
| O                        | 65.7 | 74.1 | 63.2 | 63.7 | 61.0 | -0.2                 |      |      |      |      |
| I                        | 60.8 | 63.2 | 63.8 | 57.7 | 59.2 | 0.3                  |      |      |      |      |
| S                        | 57.2 | 60.0 | 58.3 | 56.0 | 54.2 | 5.4                  |      |      |      |      |
| RS                       | 60.7 | 62.2 | 63.0 | 59.7 | 58.2 | 7.0                  |      |      |      |      |

Standard errors shown for the block treatments O, I, S, RS are for use in within-block comparisons, except for the S.E. shown for the means of these treatments.

K/9

## WHEAT

Little Knott, 1944-1946

The interrelationship of Eyespot infection, time of sowing, and sulphate of ammonia for four varieties.

Design; 4 randomized blocks of 8 plots each, plots split for sulphate of ammonia, with certain interactions confounded with block differences.

Area of each sub-plot; 0.0167 acre.

## Treatments

To blocks in 1944 season only; Inoculation; none, inoculated with stubble infected with Eyespot.

To blocks in 1946 only; none, sulphuric acid spray in March (100 gal. per acre 12 $\frac{1}{2}$ % B.O.V.)

To whole plots; Varieties, Red Standard (R), Wilma (W), Vilmorin (V), Desprez 80 (D). Time of sowing; Early, Late.

To sub-plots; Sulphate of Ammonia, none, 0.8 cwt. N per acre applied in Mid-March (E), Mid-May (L), half-early and half-late (EL).

## Crop Notes

|      | Early    | Sown | Late     | Harvested |                        |
|------|----------|------|----------|-----------|------------------------|
| 1944 | 20/10/43 |      | 16/11/43 | Aug. 11   | (Previous crop, Wheat) |
| 1945 | 25/10/44 |      | 30/11/44 | Aug. 21   |                        |
| 1946 | 13/10/45 |      | 7/11/45  | Aug. 24   |                        |

| Standard errors; per whole plot |             |                       |  | sub-plot (cwt. per acre) |  |
|---------------------------------|-------------|-----------------------|--|--------------------------|--|
| 1944                            | Grain       | 2.98 or 9.1%, 13 d.f. |  | 2.51 or 7.6%, 20 d.f.    |  |
|                                 | Straw       | 4.43 or 8.6%, 13 d.f. |  | 4.50 or 8.8%, 20 d.f.    |  |
|                                 | Transformed |                       |  |                          |  |
|                                 | % Eyespot   | 2.43, 13 d.f.         |  | 4.16, 20 d.f.            |  |
| 1945                            | Grain       | 2.19 or 6.7%, 13 d.f. |  | 1.87 or 5.7%, 19 d.f.    |  |
|                                 | Straw       | 2.83 or 4.7%, 13 d.f. |  | 2.45 or 4.0%, 19 d.f.    |  |
|                                 | Transformed |                       |  |                          |  |
|                                 | % Eyespot   | 5.73, 13 d.f.         |  | 7.34, 20 d.f.            |  |
| 1946                            | Grain       | 2.56 or 8.1%, 12 d.f. |  | 2.35 or 7.4%, 18 d.f.    |  |
|                                 | Straw       | 3.79 or 6.3%, 13 d.f. |  | 2.63 or 4.4%, 20 d.f.    |  |
|                                 | Transformed |                       |  |                          |  |
|                                 | % Eyespot   | 6.73, 12 d.f.         |  | 5.38, 18 d.f.            |  |

K/10

## Wheat - Little Knott, 1944-46

Grain, cwt. per acre

| Time of applicn. of N | Mean    | R               | W    | V    | D    | Late-early sowing | Inocn. effect | Spraying effect |
|-----------------------|---------|-----------------|------|------|------|-------------------|---------------|-----------------|
|                       | (a)&(b) | 1944<br>(c)&(d) |      |      |      | (c)&(d)           | (c)&(d)       | (c)&(d)         |
| O                     | 32.9    | 35.5            | 30.3 | 31.7 | 34.0 | -3.9              | 1.3           |                 |
| E                     | 32.7    | 34.9            | 32.6 | 31.5 | 31.7 | -5.6              | -0.8          |                 |
| L                     | 33.2    | 35.5            | 32.1 | 32.3 | 33.1 | -5.9              | -1.9          |                 |
| EL                    | 32.6    | 32.9            | 31.5 | 32.5 | 33.4 | -3.4              | 2.0           |                 |
|                       |         | 1945            |      |      |      |                   |               |                 |
| O                     | 31.9    | 31.0            | 30.8 | 30.6 | 35.3 | 0.2               | 0.3           |                 |
| E                     | 32.5    | 31.7            | 28.7 | 35.1 | 34.4 | -1.6              | 1.9           |                 |
| L                     | 33.6    | 35.0            | 29.9 | 33.9 | 35.7 | -0.9              | 0.6           |                 |
| EL                    | 33.5    | 32.7            | 28.3 | 35.4 | 37.7 | -0.7              | 1.1           |                 |
|                       |         | 1946            |      |      |      |                   |               |                 |
| O                     | 29.9    | 27.6            | 32.4 | 27.5 | 32.2 | 1.3               | -4.3          | 1.3             |
| E                     | 31.2    | 26.3            | 40.5 | 30.9 | 26.9 | -2.9              | 1.3           | -1.1            |
| L                     | 33.0    | 30.3            | 39.3 | 32.4 | 30.1 | -3.7              | -1.7          | -2.3            |
| EL                    | 31.9    | 29.7            | 35.1 | 33.2 | 29.6 | -1.2              | -0.2          | -0.7            |

| Variety | Mean       | Late-early sowing | Inoculation effect | Spraying effect                  |
|---------|------------|-------------------|--------------------|----------------------------------|
|         |            | 1944              |                    |                                  |
|         | $\pm 1.05$ | $\pm 2.11$        | $\pm 2.11$         | Standard errors;                 |
| R       | 34.7       | 1.0               | -3.0               | 1944 1945 1946                   |
| W       | 31.6       | -3.8              | -0.6               | (a) 0.63 0.47 0.59               |
| V       | 32.0       | -13.2             | -0.8               | (b) 0.87 0.64 0.76               |
| D       | 33.0       | -3.1              | 4.9                | (c) 1.26 0.94 1.18               |
| Mean    | 32.8       | -4.8              |                    | (d) 1.73 1.28 1.52               |
|         |            | 1945              |                    |                                  |
|         | $\pm 0.77$ | $\pm 1.55$        | $\pm 1.55$         | (a) and (c) are for use in       |
| R       | 32.6       | 3.3               | 0.3                | vertical comparisons E v. L      |
| W       | 29.4       | -0.1              | 1.1                | and O v. EL, (b) and (d) are     |
| V       | 33.8       | 2.2               | -0.5               | for use in all other comparisons |
| D       | 35.8       | -8.4              | 3.2                | Inoculation and spraying effects |
| Mean    | 32.9       | -0.7              |                    | were confounded with block       |
|         |            |                   |                    | differences; the standard        |
|         |            |                   |                    | errors quoted are for use in     |
|         |            |                   |                    | vertical comparisons.            |
|         |            | 1946              |                    |                                  |
|         | $\pm 0.91$ | $\pm 1.81$        | $\pm 1.81$         | $\pm 1.81$                       |
| R       | 28.4       | 2.5               | -0.5               | 1.7                              |
| W       | 36.8       | -0.3              | -1.3               | 0.9                              |
| V       | 31.0       | -1.0              | -1.4               | 1.0                              |
| D       | 29.8       | -7.6              | -1.7               | -6.4                             |
| Mean    | 31.5       | -1.6              |                    |                                  |

K/11

## Straw, cwt. per acre

| Time of<br>applcn.<br>of N | Mean    | R       | W    | V    | D    | Late-<br>early<br>sowing | Inocn.<br>effect | Spraying<br>effect |
|----------------------------|---------|---------|------|------|------|--------------------------|------------------|--------------------|
| 1944                       |         |         |      |      |      |                          |                  |                    |
|                            | (a)&(b) | (c)&(d) |      |      |      | (c)&(d)                  | (c)&(d)          | (c)&(d)            |
| O                          | 51.5    | 53.9    | 53.1 | 44.1 | 55.0 | -7.0                     | 1.4              |                    |
| E                          | 51.5    | 53.0    | 59.4 | 44.0 | 49.5 | -7.3                     | -2.8             |                    |
| L                          | 52.4    | 54.7    | 55.0 | 45.5 | 54.6 | -10.1                    | -4.1             |                    |
| EL                         | 49.8    | 50.0    | 51.3 | 45.6 | 52.3 | -10.0                    | 3.3              |                    |
| 1945                       |         |         |      |      |      |                          |                  |                    |
| O                          | 54.9    | 54.9    | 56.4 | 54.3 | 54.0 | - 0.2                    | 4.2              |                    |
| E                          | 62.8    | 64.2    | 64.6 | 62.2 | 60.2 | - 3.2                    | -2.0             |                    |
| L                          | 60.2    | 62.6    | 61.8 | 59.4 | 57.2 | 0.6                      | 1.0              |                    |
| EL                         | 63.4    | 63.6    | 63.8 | 65.0 | 61.2 | - 1.2                    | 4.6              |                    |
| 1946                       |         |         |      |      |      |                          |                  |                    |
| O                          | 54.1    | 54.2    | 55.0 | 53.8 | 53.3 | - 0.8                    | 2.8              | 0.2                |
| E                          | 60.6    | 62.0    | 68.1 | 58.8 | 53.7 | - 8.9                    | 2.7              | 1.7                |
| L                          | 62.6    | 65.3    | 63.6 | 62.3 | 59.0 | - 6.4                    | -0.1             | -1.8               |
| EL                         | 62.0    | 62.4    | 65.3 | 60.4 | 60.1 | - 5.5                    | 3.9              | -2.1               |

| Variety | Mean       | Late-early sowing | Inoculation effect | Spraying effect | Standard errors;                                                   |      |      |      |
|---------|------------|-------------------|--------------------|-----------------|--------------------------------------------------------------------|------|------|------|
|         |            | 1944              |                    |                 | 1944                                                               | 1945 | 1946 |      |
| R       | $\pm 1.57$ | $\pm 3.14$        | $\pm 3.14$         |                 | (a)                                                                | 1.13 | 0.61 | 0.66 |
| W       | 52.8       | 0.4               | -2.9               |                 | (b)                                                                | 1.36 | 0.83 | 1.06 |
| V       | 54.6       | -8.1              | -0.5               |                 | (c)                                                                | 2.25 | 1.22 | 1.32 |
| D       | 44.8       | -19.8             | 0.2                |                 | (d)                                                                | 2.72 | 1.66 | 2.11 |
|         | 52.8       | - 6.9             | 1.1                |                 |                                                                    |      |      |      |
| Mean    | 51.2       | - 8.6             |                    |                 | (a) and (c) are for use in vertical comparisons E v. L and O v. EL |      |      |      |
|         |            | 1945              |                    |                 | (b) and (d) are for use in all other comparisons                   |      |      |      |
| R       | $\pm 1.00$ | $\pm 2.00$        | $\pm 2.00$         |                 |                                                                    |      |      |      |
| W       | 61.4       | 1.4               | 2.7                |                 |                                                                    |      |      |      |
| V       | 61.7       | -2.6              | 3.0                |                 |                                                                    |      |      |      |
| D       | 60.2       | -0.1              | 1.7                |                 |                                                                    |      |      |      |
|         | 58.2       | -2.9              | 0.5                |                 |                                                                    |      |      |      |
| Mean    | 60.4       | -1.0              |                    |                 |                                                                    |      |      |      |
|         |            | 1946              |                    |                 |                                                                    |      |      |      |
| R       | $\pm 1.34$ | $\pm 2.68$        | $\pm 2.68$         | $\pm 2.68$      |                                                                    |      |      |      |
| W       | 61.0       | -5.3              | 2.4                | -0.9            |                                                                    |      |      |      |
| V       | 63.0       | -4.4              | 4.2                | 0.2             |                                                                    |      |      |      |
| D       | 58.8       | -7.3              | 1.7                | 3.3             |                                                                    |      |      |      |
|         | 56.6       | -4.7              | 1.3                | -4.5            |                                                                    |      |      |      |
| Mean    | 59.8       | -5.5              |                    |                 |                                                                    |      |      |      |

Inoculation and spraying effects were confounded with block differences; the standard errors quoted are for use in vertical comparisons.

Inoculation and spraying effects were confounded with block differences; the standard errors quoted are for use in vertical comparisons.

K/12

Wheat - Little Knott 1944-46

Transformed Percentage Eyespot infection at harvest

| Time of<br>applcn.<br>of N | Mean    | R       | W    | V    | D    | Late-<br>early<br>Sowing | Inocn.<br>effect | Spraying<br>effect |
|----------------------------|---------|---------|------|------|------|--------------------------|------------------|--------------------|
| 1944                       |         |         |      |      |      |                          |                  |                    |
|                            | (a)&(b) | (c)&(d) |      |      |      | (c)&(d)                  | (c)&(d)          | (c)&(d)            |
| O                          | 19.8    | 19.7    | 23.3 | 20.2 | 16.1 | -2.7                     | 23.8             |                    |
| E                          | 16.6    | 20.7    | 17.8 | 16.0 | 12.0 | -0.6                     | 21.6             |                    |
| L                          | 19.3    | 23.0    | 20.6 | 14.9 | 18.8 | -5.2                     | 26.4             |                    |
| EL                         | 17.2    | 21.3    | 17.1 | 15.3 | 14.9 | -2.3                     | 26.5             |                    |

|      |      |      |      |      |      |       |      |  |
|------|------|------|------|------|------|-------|------|--|
| 1945 |      |      |      |      |      |       |      |  |
| O    | 24.5 | 32.3 | 30.0 | 26.2 | 9.6  | -21.2 | 12.1 |  |
| E    | 26.3 | 32.7 | 32.7 | 25.7 | 14.3 | -17.9 | 3.3  |  |
| L    | 22.6 | 29.6 | 25.6 | 24.2 | 10.8 | -16.4 | 1.1  |  |
| EL   | 24.7 | 33.2 | 35.9 | 14.9 | 14.7 | -20.8 | 11.4 |  |

|      |      |      |      |      |      |       |      |       |
|------|------|------|------|------|------|-------|------|-------|
| 1946 |      |      |      |      |      |       |      |       |
| O    | 25.1 | 29.9 | 25.4 | 22.1 | 22.9 | -7.3  | -3.9 | -14.4 |
| E    | 25.5 | 32.8 | 20.2 | 27.5 | 21.6 | -16.3 | -4.5 | -8.7  |
| L    | 22.2 | 33.3 | 18.6 | 18.7 | 18.2 | -13.2 | -1.2 | -10.3 |
| EL   | 24.1 | 29.0 | 23.8 | 23.4 | 20.2 | -5.0  | 1.6  | -5.0  |

| Variety | Mean | Late-<br>early<br>sowing | Inocn.<br>effect | Spraying<br>effect |
|---------|------|--------------------------|------------------|--------------------|
|---------|------|--------------------------|------------------|--------------------|

|      |            |            |            |  |
|------|------------|------------|------------|--|
| 1944 |            |            |            |  |
| R    | $\pm 0.86$ | $\pm 1.72$ | $\pm 1.72$ |  |
| W    | 21.2       | -3.8       | 28.8       |  |
| V    | 19.7       | -1.8       | 31.4       |  |
| D    | 16.6       | -3.5       | 19.1       |  |
| Mean | 15.4       | -1.7       | 19.1       |  |

|      |            |            |            |  |
|------|------------|------------|------------|--|
| 1945 |            |            |            |  |
| R    | $\pm 2.03$ | $\pm 4.05$ | $\pm 4.05$ |  |
| W    | 32.0       | -25.5      | 8.9        |  |
| V    | 31.0       | -19.7      | 12.1       |  |
| D    | 22.8       | -20.1      | 6.1        |  |
| Mean | 12.4       | -11.1      | 0.7        |  |

|      |            |            |            |            |
|------|------------|------------|------------|------------|
| 1946 |            |            |            |            |
| R    | $\pm 2.38$ | $\pm 4.76$ | $\pm 4.76$ | $\pm 4.76$ |
| W    | 31.2       | -14.1      | 3.1        | -15.5      |
| V    | 22.0       | -12.2      | 1.8        | -6.8       |
| D    | 22.9       | -9.0       | -1.8       | -3.8       |
| Mean | 20.7       | -6.6       | -11.1      | -12.3      |

Standard Errors;

|     |      |      |      |
|-----|------|------|------|
|     | 1944 | 1945 | 1946 |
| (a) | 1.04 | 1.83 | 1.35 |
| (b) | 0.95 | 1.93 | 1.93 |
| (c) | 2.08 | 3.67 | 2.69 |
| (d) | 1.91 | 3.86 | 3.87 |

(a) and (c) are for use in vertical comparisons E v. L and O v. EL

(b) and (d) are for use in all other comparisons.

Inoculation and spraying effects were confounded with block differences; the standard errors quoted are for use in vertical comparisons

K/13

## Percentage Eyespot at harvest

| Time of<br>applcn. of N | Mean | R    | W    | V    | D    | Late-<br>early<br>sowing | Inocn.<br>effect | Spraying<br>effect |
|-------------------------|------|------|------|------|------|--------------------------|------------------|--------------------|
| 1944                    |      |      |      |      |      |                          |                  |                    |
| O                       | 11.5 | 11.4 | 15.6 | 11.9 | 7.7  | -3.0                     | 25.9             |                    |
| E                       | 8.2  | 12.5 | 9.3  | 7.6  | 4.3  | -0.6                     | 20.1             |                    |
| L                       | 10.9 | 15.2 | 12.4 | 6.6  | 10.4 | -5.6                     | 27.8             |                    |
| EL                      | 8.7  | 13.2 | 8.6  | 7.0  | 6.6  | -2.3                     | 25.1             |                    |

|      |      |      |      |      |     |       |      |  |
|------|------|------|------|------|-----|-------|------|--|
| 1945 |      |      |      |      |     |       |      |  |
| O    | 17.1 | 28.6 | 25.0 | 19.5 | 2.8 | -27.2 | 15.8 |  |
| E    | 19.6 | 29.2 | 29.2 | 18.9 | 6.1 | -24.4 | 4.6  |  |
| L    | 14.8 | 24.4 | 18.7 | 16.8 | 3.5 | -20.0 | 1.4  |  |
| EL   | 17.4 | 30.0 | 34.3 | 6.6  | 6.4 | -26.9 | 15.0 |  |

|      |      |      |      |      |      |       |      |       |
|------|------|------|------|------|------|-------|------|-------|
| 1946 |      |      |      |      |      |       |      |       |
| O    | 18.0 | 24.9 | 18.4 | 14.1 | 15.1 | -9.7  | -5.2 | -19.2 |
| E    | 18.6 | 29.3 | 11.9 | 21.3 | 13.6 | -21.9 | -6.1 | -11.8 |
| L    | 14.2 | 30.2 | 17.2 | 10.3 | 9.8  | -16.0 | -1.4 | -12.5 |
| EL   | 16.6 | 23.5 | 16.2 | 15.8 | 11.9 | -6.4  | 2.1  | -6.4  |

| Variety | Mean | Late-<br>early<br>sowing | Inoculation<br>effect | Spraying<br>effect |
|---------|------|--------------------------|-----------------------|--------------------|
|---------|------|--------------------------|-----------------------|--------------------|

|      |      |      |      |  |
|------|------|------|------|--|
| 1944 |      |      |      |  |
| R    | 13.1 | -4.5 | 32.4 |  |
| W    | 11.4 | -2.0 | 33.0 |  |
| V    | 8.2  | -3.4 | 18.0 |  |
| D    | 7.1  | -1.5 | 16.8 |  |
| Mean | 9.8  | -2.8 |      |  |

|      |      |       |      |  |
|------|------|-------|------|--|
| 1945 |      |       |      |  |
| R    | 28.1 | -38.7 | 13.9 |  |
| W    | 26.5 | -29.7 | 18.4 |  |
| V    | 15.0 | -24.5 | 7.6  |  |
| D    | 4.6  | -8.0  | 0.5  |  |
| Mean | 17.1 | -24.8 |      |  |

|      |      |       |       |       |
|------|------|-------|-------|-------|
| 1946 |      |       |       |       |
| R    | 26.8 | -21.6 | 4.7   | -23.8 |
| W    | 14.0 | -14.6 | 2.1   | -8.2  |
| V    | 15.1 | -11.1 | -2.2  | -4.7  |
| D    | 12.5 | -7.6  | -12.7 | -14.0 |
| Mean | 16.8 | -13.5 |       |       |

K/14

Wheat - Little Knot 1944-46

## Percentage Area Lodged at Harvest

| Time of applicn.<br>of N | Mean | R    | W    | V    | D    | Late-<br>early<br>sowing | Inocn.<br>effect | Spraying<br>effect |
|--------------------------|------|------|------|------|------|--------------------------|------------------|--------------------|
| 1944                     |      |      |      |      |      |                          |                  |                    |
| O                        | 0.8  | 3.0  | 0    | 0    | 0    | -1.5                     | 1.5              |                    |
| E                        | 0.3  | 1.2  | 0    | 0    | 0    | 0.6                      | 0.6              |                    |
| L                        | 0.2  | 1.0  | 0    | 0    | 0    | -0.5                     | 0.5              |                    |
| EL                       | 0.6  | 2.5  | 0    | 0    | 0    | -0.8                     | 1.2              |                    |
| 1945                     |      |      |      |      |      |                          |                  |                    |
| O                        | 9.8  | 33.2 | 6.2  | 0.0  | 0.0  | -19.0                    | 8.0              |                    |
| E                        | 19.2 | 41.2 | 24.0 | 11.5 | 0.0  | -34.1                    | 10.4             |                    |
| L                        | 15.1 | 38.8 | 18.8 | 2.5  | 0.2  | -27.7                    | 7.4              |                    |
| EL                       | 13.7 | 38.5 | 6.2  | 8.8  | 1.2  | -25.8                    | 3.6              |                    |
| 1946                     |      |      |      |      |      |                          |                  |                    |
| O                        | 13.1 | 26.2 | 23.8 | 1.8  | 0.5  | -15.7                    | -3.7             | -9.9               |
| E                        | 16.2 | 44.2 | 8.2  | 0.0  | 12.5 | -27.5                    | -6.3             | -20.7              |
| L                        | 10.2 | 38.0 | 2.2  | 0.2  | 0.5  | -18.3                    | -5.3             | -17.7              |
| EL                       | 22.2 | 39.2 | 34.5 | 15.0 | 0.2  | -24.7                    | 7.5              | -23.3              |

| Variety | Mean | Late-<br>early<br>sowing | Inocn.<br>effect | Spraying<br>effect |
|---------|------|--------------------------|------------------|--------------------|
| 1944    |      |                          |                  |                    |
| R       | 2.0  | -2.1                     | 3.9              |                    |
| W       | 0    | 0                        | 0                |                    |
| V       | 0    | 0                        | 0                |                    |
| D       | 0    | 0                        | 0                |                    |
| Mean    | 0.5  | -0.6                     |                  |                    |
| 1945    |      |                          |                  |                    |
| R       | 38.0 | -67.4                    | 9.1              |                    |
| W       | 13.8 | -27.4                    | 18.6             |                    |
| V       | 5.6  | -11.1                    | 1.1              |                    |
| D       | 0.4  | -0.8                     | 0.5              |                    |
| Mean    | 14.4 | -26.7                    |                  |                    |
| 1946    |      |                          |                  |                    |
| R       | 37.0 | -39.7                    | 11.1             | -31.7              |
| W       | 17.2 | -32.1                    | -9.6             | -24.6              |
| V       | 4.2  | -8.3                     | -2.3             | -8.5               |
| D       | 3.4  | -6.1                     | -6.9             | -6.9               |
| Mean    | 15.4 | -21.5                    |                  |                    |

K/15

WHEAT

Hoosfield, 1944

Effects of time of sowing, sulphate of ammonia and sulphuric acid spraying, on yield and Eyespot infection.

Design; 4 randomized blocks of 8 plots each, the plots being split into two for different rates of application of sulphate of ammonia

Area of each sub-plot; 0.0164 acre

Treatments

On blocks

Time of sowing: Early (Oct. 19), late (Nov. 5)

On whole plots

Time and rate of spraying; None, November (at single and double rates).

February, early March, late March, April (all at single rate).

Rates of spraying: 100 galls. per acre 12.5% or 22.2% B.O.V.

On sub-plots

Sulphate of ammonia: 0.6, 1.2 cwt. N per acre as top dressing in Spring

Crop Notes

Harvested; Aug. 16. Variety; Red Standard

Previous crop; Wheat

Standard errors per plot:

Grain;

|                |                                      |
|----------------|--------------------------------------|
| per whole plot | 1.49 cwt. per acre or 6.7%, 16 d.f.  |
| per sub-plot   | 3.28 cwt. per acre or 14.7%, 24 d.f. |

Straw;

|                |                                      |
|----------------|--------------------------------------|
| per whole plot | 2.03 cwt. per acre or 7.5%, 16 d.f.  |
| per sub-plot   | 3.70 cwt. per acre or 13.7%, 24 d.f. |

Transformed Percentage Eyespot at harvest

|                |               |
|----------------|---------------|
| per whole plot | 3.41, 16 d.f. |
| per sub-plot   | 3.48, 24 d.f. |

K/16

Wheat - Hoosfield 1944

|                    | Mean                 | Response<br>to N  | Late-early<br>sowing | Mean                 | Response<br>to N  | Late-early<br>sowing |
|--------------------|----------------------|-------------------|----------------------|----------------------|-------------------|----------------------|
|                    | Grain; cwt. per acre |                   |                      | Straw; cwt. per acre |                   |                      |
| Time of spraying   | $\pm 0.74$           | $\pm 2.32$        | $\pm 1.49$           | $\pm 1.02$           | $\pm 2.62$        | $\pm 2.03$           |
| None               | 23.2 <sup>a</sup>    | 4.3 <sup>b</sup>  | 3.2 <sup>c</sup>     | 28.8 <sup>d</sup>    | 6.0 <sup>e</sup>  | 3.5 <sup>f</sup>     |
| November           | 24.4                 | 2.4               | 0.4                  | 29.9                 | 5.0               | 2.9                  |
| Nov. (double rate) | 24.1                 | 1.9               | -0.8                 | 30.2                 | 4.7               | -0.4                 |
| February           | 20.7                 | 8.5               | -1.2                 | 24.0                 | 9.8               | 0.2                  |
| Early March        | 22.4                 | 4.1               | -0.7                 | 26.0                 | 5.4               | 1.1                  |
| Late March         | 22.9                 | 3.1               | 1.8                  | 26.7                 | 4.5               | 2.9                  |
| April              | 18.4                 | 0.5               | 0.4                  | 22.3                 | 2.4               | 1.9                  |
| Time of sowing     |                      | $\pm 1.16$        |                      |                      | $\pm 1.31$        |                      |
| Early              | 22.0                 | 5.2               |                      | 26.1                 | 6.8               |                      |
| Late               | 22.8                 | 2.0               |                      | 28.0                 | 4.1               |                      |
| Mean               | 22.4                 | $\pm 0.82$<br>3.6 |                      | 27.1                 | $\pm 0.93$<br>5.4 |                      |

|                    | Transformed % Eyespot |                   |                   | % Eyespot at harvest |      |      |
|--------------------|-----------------------|-------------------|-------------------|----------------------|------|------|
| Time of Spraying   | $\pm 1.71$            | $\pm 2.46$        | $\pm 3.41$        |                      |      |      |
| None               | 35.5 <sup>g</sup>     | -2.0 <sup>h</sup> | -5.7 <sup>j</sup> | 33.7                 | -3.2 | -9.4 |
| November           | 32.5                  | 0.1               | 2.9               | 28.9                 | 0.2  | 4.7  |
| Nov. (double rate) | 29.7                  | -2.1              | 1.9               | 24.6                 | -3.1 | 2.9  |
| February           | 21.4                  | 0.8               | -5.6              | 13.3                 | 0.9  | -6.6 |
| Early March        | 24.4                  | 3.5               | 0.4               | 17.0                 | 4.6  | 0.5  |
| Late March         | 29.2                  | 3.5               | -1.7              | 23.8                 | 5.2  | -2.5 |
| April              | 38.0                  | 5.0               | -3.6              | 37.8                 | 8.5  | -6.2 |
| Time of sowing     |                       | $\pm 1.23$        |                   |                      |      |      |
| Early              | 31.8                  | -0.7              |                   | 27.8                 | -1.1 |      |
| Late               | 29.7                  | 2.4               |                   | 24.6                 | 3.6  |      |
| Mean               | 30.8                  | $\pm 0.87$<br>0.8 |                   | 26.2                 | 1.2  |      |

Standard Errors (a) 0.53 (b) 1.64 (c) 1.05 (d) 0.72 (e) 1.85 (f) 1.44  
 (g) 1.21 (h) 1.74 (j) 2.41

Standard errors shown in the "Late-Early sowing" columns are only for use in vertical comparisons.

WHEAT

K/17

Pennell's Piece and Exhaustion Land 1945

Control of Eyespot by burning and spraying.

Design; Pennell's Piece, 3 randomized blocks of 8 plots each, plots split for sulphate of ammonia.

Exhaustion Land, 2 randomized blocks of 8 plots each, plots split for sulphate of ammonia.

Area of each plot; Pennell's Piece, 0.0125, 0.0094 and 0.0062 acres in different blocks.

Exhaustion Land, 0.0167 acre.

Treatments

None, stubble burnt with flame gun, sprayed with sulphuric acid in October, February, early March, late March and April.

Sulphate of ammonia: 0.6 and 1.2 cwt. N per acre on split plots as top dressing in March.

Crop Notes

Pennell's Piece

Stubble burnt with flame gun: Oct. 11 and Nov. 2. Seed sown; Oct. 27. Harvested; Aug. 20. Variety; Red Standard. Previous crop; Wheat

Exhaustion Land

Seed sown; Oct. 30. Stubble burnt with flame gun; Nov. 2. Harvested; Aug. 15. Variety; Red Standard. Previous crop; Wheat.

Standard errors per plot: Pennell's Piece: Grain, per whole plot 2.35 cwt.  
or 9.6%, 15 d.f.  
per split plot .24 cwt.  
or 21.4%, 17 d.f.  
Straw, per whole plot 5.64 cwt.  
or 9.7%, 15 d.f.  
per split plot 6.11 cwt.  
or 10.5%, 17 d.f.  
Transf. % Eyespot at harvest, per whole plot  
8.1%, 15 d.f.  
per split plot 17.53,  
17 d.f.  
Exhaustion Land: Grain, per whole plot 1.31 cwt.  
or 4.9%, 8 d.f.  
per split plot 1.48 cwt.  
or 5.5%, 9 d.f.  
Straw, per whole plot 2.44 cwt.  
or 5.2%, 8 d.f.  
per split plot 2.29 cwt.  
or 4.9%, 9 d.f.  
Transf. % Eyespot at harvest, per whole plot  
5.60, 8 d.f.  
per split plot 3.43, 9 d.f.

K/18

Wheat - Pennell's Piece and Exhaustion Land, 1945

## Pennell's Piece

|                                                                               | None             | Stubble<br>burnt  | Sprayed with sulphuric acid |          |          |          | Mean              |
|-------------------------------------------------------------------------------|------------------|-------------------|-----------------------------|----------|----------|----------|-------------------|
|                                                                               |                  |                   | October                     | February | E. March | L. March |                   |
| Grain: cwt. per acre                                                          |                  |                   |                             |          |          |          |                   |
| Mean                                                                          | ±1.36            | 22.2 <sup>a</sup> | 24.2                        | 25.9     | 25.7     | 25.4     | 24.4              |
| Response to N                                                                 | ±4.27            | 0.4 <sup>b</sup>  | -4.3                        | -2.0     | 3.6      | -3.9     | -0.4 <sup>c</sup> |
| Straw: cwt. per acre                                                          |                  |                   |                             |          |          |          |                   |
| Mean                                                                          | ±3.25            | 57.1 <sup>d</sup> | 58.2                        | 62.6     | 59.0     | 55.5     | 58.3              |
| Response to N                                                                 | ±4.98            | 12.8 <sup>e</sup> | 11.4                        | 5.2      | 9.3      | 3.4      | 10.6 <sup>f</sup> |
| Transformed Percentage Eyespot                                                |                  |                   |                             |          |          |          |                   |
| Mean                                                                          | ±4.7             | 43.6 <sup>g</sup> | 39.1                        | 37.1     | 35.4     | 35.8     | 38.8              |
| Response to N                                                                 | ±4.3             | -4.9 <sup>h</sup> | -2.6                        | -4.8     | 20.0     | 4.7      | 0.7 <sup>j</sup>  |
| Percentage Eyespot                                                            |                  |                   |                             |          |          |          |                   |
| Mean                                                                          | 47.5             | 40.3              | 39.8                        | 36.3     | 33.5     | 34.2     | 39.3              |
| Response to N                                                                 | -8.7             | 1.7               | -4.5                        | -8.1     | 32.3     | 7.7      | 1.2               |
| Percentage area lodged at harvest                                             |                  |                   |                             |          |          |          |                   |
| Mean                                                                          | 69.2             | 61.7              | 67.8                        | 46.2     | 39.5     | 49.2     | 57.1              |
| Response to N                                                                 | -15.9            | 3.3               | 11.0                        | 11.0     | 52.4     | 28.3     | 8.2               |
| Standard errors (a) 0.96 (b) 3.02 (c) 1.51 (d) 2.30 (e) 3.52 (f) 1.76 (g) 3.3 |                  |                   |                             |          |          |          |                   |
|                                                                               | (h) 10.1 (j) 5.1 |                   |                             |          |          |          |                   |

K/19

## Exhaustion Land

|                                | None                     | Stubble<br>burnt                      | Sprayed with sulphuric acid |          |          |             | Mean                     |
|--------------------------------|--------------------------|---------------------------------------|-----------------------------|----------|----------|-------------|--------------------------|
|                                |                          |                                       | October                     | February | E. March | April       |                          |
| Mean<br>Response to N          | $\pm 0.93$<br>$\pm 1.48$ | 26.2 <sup>a</sup><br>4.0 <sup>b</sup> | Grain; cwt. per acre        |          |          |             | 26.9<br>3.1 <sup>c</sup> |
|                                |                          |                                       | 26.5                        | 27.0     | 27.6     | 29.2        |                          |
|                                |                          |                                       | 6.2                         | 3.8      | -1.0     | 24.4<br>1.8 |                          |
| Mean<br>Response to N          | $\pm 1.73$<br>$\pm 2.29$ | 49.8<br>5.9                           | Straw; cwt. per acre        |          |          |             | 46.6<br>5.0 <sup>f</sup> |
|                                |                          |                                       | 52.0                        | 45.2     | 44.0     | 47.0        |                          |
|                                |                          |                                       | 5.6                         | 4.5      | 0.2      | 38.5<br>5.8 |                          |
| Transformed Percentage Eyespot |                          |                                       |                             |          |          |             |                          |
| Mean<br>Response to N          | $\pm 3.96$<br>$\pm 3.43$ | 31.8 <sup>g</sup><br>2.1              | 26.6                        | 20.4     | 21.7     | 26.7        | 28.1                     |
|                                |                          |                                       | 5.6                         | -1.4     | 1.5      | -6.1        | -1.1 <sup>j</sup>        |
|                                |                          |                                       | 29.7                        | -1.0     |          |             |                          |
| Percentage Eyespot             |                          |                                       |                             |          |          |             |                          |
| Mean<br>Response to N          | 31.0<br>-7.6             | 27.8<br>3.3                           | 20.0                        | 12.2     | 13.7     | 20.1        | 22.1                     |
|                                |                          |                                       | 7.9                         | -1.6     | 1.7      | -8.6        | -1.5                     |
|                                |                          |                                       | 24.6                        |          |          |             |                          |

Standard Errors (a) 0.66 (b) 1.04 (c) 0.52 (d) 1.22 (e) 1.62 (f) 0.81 (g) 2.80 (h) 2.42 (j) 1.21.

K/20

# WHEAT

## Little Knott 1945

Effect of Eyespot disease on the yield of wheat.

Design; 6 randomized blocks of 3 plots each.

Area of each plot: 0.0227 acre

### Treatments

Not inoculated.

Inoculated with "Eyespot" at light rate

Stubble put on plots Nov. 1st., and spread Nov. 6th

Inoculated at heavy rate.

3 boxes of infected plants put on each plot Oct. 31st.,

3 more boxes put on each plot Nov. 1st., stubble put on plots Nov. 1st and spread Nov. 6th.

### Crop Notes

Seed sown; Oct. 25th Harvested; Aug. 22 Variety; Red Standard.

Previous crop: Wheat

Standard errors per plot:

Grain, 0.715 cwt. per acre or 2.4%, 10 d.f.

Straw, 1.33 cwt. per acre or 2.3%, 10 d.f.

Transformed Percent. Eyespot at harvest 4.32, 10 d.f.

|                                                    | Inoculation |       |       | Mean |
|----------------------------------------------------|-------------|-------|-------|------|
|                                                    | None        | Light | Heavy |      |
| Grain: cwt. per acre $\pm 0.30$                    | 26.9        | 31.3  | 30.1  | 29.5 |
| Straw: cwt. per acre $\pm 0.54$                    | 55.3        | 57.8  | 57.6  | 56.9 |
| Percentage Eyespot in April                        | 54.7        | 53.8  | 46.0  | 51.5 |
| Transformed Percent. Eyespot at harvest $\pm 1.76$ | 59.3        | 46.0  | 47.5  | 50.9 |
| Percentage Eyespot at harvest                      | 74.0        | 51.8  | 54.3  | 60.2 |
| Percentage area lodged at harvest                  | 94.8        | 70.8  | 69.2  | 78.3 |

K/21

# WHEAT

## Little Knott, 1946-1948

The effects of depth and rate of sowing, of sulphate of ammonia, and of spraying, on yield and Eyespot infection.

Design; 3x3x3 in 6 blocks of 9 plots each, certain three-factor interactions and the effect of spraying being confounded with block differences.

Area of each plot; 0.0152 acre

### Treatments

Rate of sowing;  $1\frac{1}{2}$ ,  $2\frac{1}{2}$  or  $3\frac{1}{2}$  (1946, and 1, 2, 3 (1947) bushels per acre (R<sub>0</sub>, R<sub>1</sub>, R<sub>2</sub>)

Depth of sowing; Approximately  $\frac{1}{2}$ ",  $1\frac{1}{2}$ ", 3" (1946) and  $\frac{3}{4}$ ",  $1\frac{1}{2}$ ",  $2\frac{1}{2}$ " (1947) (D<sub>0</sub>, D<sub>1</sub>, D<sub>2</sub>)

Sulphate of ammonia; None, 0.4, 0.8 (1946) and None, 0.3, 0.6 (1947) cwt. N per acre applied as top dressing in March.

Spraying; 3 blocks sprayed each year with sulphuric acid in autumn before germination and again in March, each time with 100 gals. per acre 12 $\frac{1}{2}$ % B.O.V.

Basal Manuring; None in 1946, 3 cwt. per acre superphosphate and 1 cwt. per acre muriate of potash in 1947.

### Crop Notes

|      | Sown     | Harvested                      |
|------|----------|--------------------------------|
| 1946 | 15.10.45 | Aug. 24 (Previous crop, Wheat) |
| 1947 | 21.10.46 | Aug. 6                         |

Variety, Squareheads Master 13/4

See also 1948 Report of Field Experiments, 48/Ca/1

Standard errors per plot;

|                      | 1946         | 1947          |         |
|----------------------|--------------|---------------|---------|
| Grain, cwt. per acre | 1.95 or 7.2% | 2.09 or 8.0%  | All     |
| Straw, cwt. per acre | 5.00 or 7.4% | 3.83 or 10.4% | with    |
| Transformed Percent. |              |               | 24 d.f. |
| Eyespot              | 8.15         | 6.18          |         |

K/22

Wheat - Little Knott 1946-48

1946

Grain: cwt. per acre

|                                        | $\pm 0.79$           |      |      |                    |                                        |
|----------------------------------------|----------------------|------|------|--------------------|----------------------------------------|
|                                        | R0                   | R1   | R2   | Mean<br>$\pm 0.46$ | Effect of<br>spraying<br>$\pm 0.92(1)$ |
| D0                                     | 27.4                 | 26.4 | 26.9 | 26.9               | 1.0                                    |
| D1                                     | 26.8                 | 27.1 | 26.4 | 26.8               | 2.3                                    |
| D2                                     | 26.5                 | 27.2 | 28.1 | 27.3               | 2.1                                    |
|                                        | NO                   | N1   | N2   |                    |                                        |
| D0                                     | 27.1                 | 26.7 | 26.9 |                    |                                        |
| D1                                     | 26.6                 | 27.2 | 26.6 |                    |                                        |
| D2                                     | 26.0                 | 29.1 | 26.7 |                    |                                        |
|                                        |                      |      |      |                    |                                        |
| R0                                     | 26.5                 | 27.4 | 26.7 | 26.9               | 1.5                                    |
| R1                                     | 26.9                 | 27.6 | 26.2 | 26.9               | 2.5                                    |
| R2                                     | 26.2                 | 28.0 | 27.3 | 27.1               | 1.5                                    |
| Mean $\pm 0.46$                        | 26.5                 | 27.7 | 26.7 | 27.0               |                                        |
| Effect of<br>spraying<br>$\pm 0.92(1)$ | 0.0                  | 2.3  | 3.1  |                    |                                        |
|                                        | Straw: cwt. per acre |      |      | Mean               | Effect of<br>spraying                  |
|                                        | R0                   | R1   | R2   | $\pm 1.18$         | $\pm 2.36(1)$                          |
| D0                                     | 65.8                 | 68.3 | 67.5 | 67.2               | 1.3                                    |
| D1                                     | 69.7                 | 64.8 | 67.1 | 67.2               | 2.0                                    |
| D2                                     | 68.9                 | 68.2 | 67.4 | 68.2               | -0.3                                   |
|                                        | NO                   | N1   | N2   |                    |                                        |
| D0                                     | 62.6                 | 68.4 | 70.7 |                    |                                        |
| D1                                     | 62.1                 | 69.9 | 69.5 |                    |                                        |
| D2                                     | 62.4                 | 69.6 | 72.4 |                    |                                        |
|                                        |                      |      |      |                    |                                        |
| R0                                     | 66.3                 | 67.9 | 70.2 | 68.1               | 1.5                                    |
| R1                                     | 61.3                 | 69.8 | 70.1 | 67.1               | -4.1                                   |
| R2                                     | 59.6                 | 70.2 | 72.4 | 67.4               | 1.6                                    |
| Mean $\pm 1.18$                        | 62.4                 | 69.3 | 70.9 | 67.5               |                                        |
| Effect of<br>spraying<br>$\pm 2.36(1)$ | 1.8                  | 1.0  | 0.2  |                    |                                        |

(1) S.E. only for comparison between effects.

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K/23

1946

## Transformed Percent. Eyespot at harvest

|                                     | $\pm 3.33$ |       |       | Mean<br>$\pm 1.92$ | Effect of spraying<br>$\pm 3.85(1)$ |
|-------------------------------------|------------|-------|-------|--------------------|-------------------------------------|
|                                     | R0         | R1    | R2    |                    |                                     |
| D0                                  | 38.8       | 58.4  | 52.4  | 49.9               | -19.8                               |
| D1                                  | 48.4       | 49.7  | 51.0  | 49.5               | -22.7                               |
| D2                                  | 43.1       | 43.7  | 44.6  | 43.8               | -19.6                               |
|                                     | NO         | N1    | N2    |                    |                                     |
| D0                                  | 46.2       | 46.5  | 56.9  |                    |                                     |
| D1                                  | 46.4       | 51.1  | 51.2  |                    |                                     |
| D2                                  | 41.4       | 41.4  | 48.6  |                    |                                     |
|                                     |            |       |       |                    |                                     |
| R0                                  | 41.3       | 37.5  | 51.7  | 43.5               | -12.6                               |
| R1                                  | 47.9       | 49.4  | 54.0  | 50.4               | -26.7                               |
| R2                                  | 44.8       | 52.2  | 51.0  | 49.3               | -22.8                               |
| Mean $\pm 1.92$                     | 44.7       | 46.3  | 52.2  | 47.7               |                                     |
| Effect of spraying<br>$\pm 3.85(1)$ | -18.7      | -20.6 | -22.8 |                    |                                     |

## Percentage Eyespot at harvest

|                    | R0  | R1  | R2  | Mean | Effect of spraying |
|--------------------|-----|-----|-----|------|--------------------|
| D0                 | 39  | 73  | 63  | 59   | -34                |
| D1                 | 56  | 57  | 60  | 58   | -38                |
| D2                 | 47  | 48  | 49  | 48   | -34                |
|                    | NO  | N1  | N2  |      |                    |
| D0                 | 52  | 53  | 70  |      |                    |
| D1                 | 52  | 61  | 61  |      |                    |
| D2                 | 44  | 44  | 56  |      |                    |
|                    |     |     |     |      |                    |
| R0                 | 44  | 37  | 62  | 47   | -21                |
| R1                 | 55  | 58  | 65  | 59   | -45                |
| R2                 | 50  | 62  | 60  | 57   | -38                |
| Mean               | 49  | 52  | 62  | 55   |                    |
| Effect of spraying | -32 | -35 | -37 |      |                    |

(1) S.E. only for comparison between effects.

K/24

Wheat - Little Knott 1946-48

1946

Percentage Area Lodged

|                    | R0  | R1  | R2  | Mean | Effect of spraying |
|--------------------|-----|-----|-----|------|--------------------|
| D0                 | 54  | 79  | 79  | 71   | -60                |
| D1                 | 56  | 61  | 80  | 66   | -70                |
| D2                 | 48  | 60  | 67  | 58   | -60                |
|                    | NO  | N1  | N2  |      |                    |
| D0                 | 66  | 69  | 79  |      |                    |
| D1                 | 57  | 68  | 73  |      |                    |
| D2                 | 42  | 55  | 77  |      |                    |
|                    |     |     |     |      |                    |
| R0                 | 55  | 37  | 66  | 53   | -74                |
| R1                 | 59  | 68  | 74  | 67   | -73                |
| R2                 | 52  | 84  | 87  | 76   | -42                |
| Mean               | 55  | 64  | 76  | 65   |                    |
| Effect of spraying | -79 | -68 | -45 |      |                    |

1947

Grain: cwt. per acre

|                                  | R0   | R1         | R2   | Mean       | Effect of spraying |
|----------------------------------|------|------------|------|------------|--------------------|
|                                  |      | $\pm 0.85$ |      | $\pm 0.49$ | $\pm 0.99(1)$      |
| D0                               | 24.3 | 26.9       | 27.2 | 26.1       | 2.1                |
| D1                               | 24.5 | 25.5       | 26.3 | 25.5       | 0.9                |
| D2                               | 25.4 | 26.8       | 27.0 | 26.4       | 1.8                |
|                                  | NO   | N1         | N2   |            |                    |
| D0                               | 23.3 | 26.9       | 28.3 |            |                    |
| D1                               | 22.0 | 26.0       | 28.3 |            |                    |
| D2                               | 24.0 | 26.7       | 28.4 |            |                    |
|                                  |      |            |      |            |                    |
| R0                               | 22.3 | 25.1       | 26.9 | 24.7       | 1.9                |
| R1                               | 24.0 | 26.9       | 28.4 | 26.4       | 1.2                |
| R2                               | 23.1 | 27.7       | 29.8 | 26.8       | 1.8                |
| Mean $\pm 0.49$                  | 23.1 | 26.5       | 28.3 | 26.0       |                    |
| Effect of spraying $\pm 0.99(1)$ | 0.5  | 2.8        | 1.5  |            |                    |

(1) S.E. only for comparison between effects.

1947

K/25

| Straw: cwt. per acre                   |      |            |      |            |                    |
|----------------------------------------|------|------------|------|------------|--------------------|
|                                        |      | $\pm 1.56$ |      | Mean       | Effect of spraying |
|                                        | R0   | R1         | R2   | $\pm 0.90$ | $\pm 1.81^{(1)}$   |
| D0                                     | 35.1 | 38.0       | 37.5 | 36.9       | -0.1               |
| D1                                     | 36.8 | 35.0       | 37.2 | 36.3       | -1.3               |
| D2                                     | 35.6 | 36.7       | 38.0 | 36.8       | -1.6               |
|                                        | NO   | N1         | N2   |            |                    |
| D0                                     | 32.5 | 37.8       | 40.3 |            |                    |
| D1                                     | 30.7 | 37.6       | 40.7 |            |                    |
| D2                                     | 31.7 | 37.1       | 41.5 |            |                    |
| R0                                     | 31.8 | 35.9       | 39.7 | 35.8       | -1.6               |
| R1                                     | 32.3 | 37.5       | 40.0 | 36.6       | -1.9               |
| R2                                     | 30.7 | 39.2       | 42.8 | 37.6       | 0.6                |
| Mean $\pm 0.90$                        | 31.6 | 37.5       | 40.8 | 36.7       |                    |
| Effect of spraying<br>$\pm 1.81^{(1)}$ | -1.5 | 0.3        | -1.7 |            |                    |

| Transformed Percent. Eyespot at harvest |      |            |      |            |                    |
|-----------------------------------------|------|------------|------|------------|--------------------|
|                                         |      | $\pm 2.52$ |      | Mean       | Effect of spraying |
|                                         | R0   | R1         | R2   | $\pm 1.46$ | $\pm 2.91^{(1)}$   |
| D0                                      | 28.7 | 28.7       | 25.9 | 27.8       | -7.0               |
| D1                                      | 31.2 | 25.1       | 24.2 | 26.8       | -8.3               |
| D2                                      | 26.4 | 23.0       | 22.4 | 23.9       | -6.4               |
|                                         | NO   | N1         | N2   |            |                    |
| D0                                      | 24.9 | 28.6       | 29.8 |            |                    |
| D1                                      | 24.3 | 27.8       | 28.4 |            |                    |
| D2                                      | 22.0 | 21.8       | 27.9 |            |                    |
| R0                                      | 27.5 | 27.9       | 30.9 | 28.8       | -9.9               |
| R1                                      | 24.4 | 26.6       | 25.8 | 25.6       | -4.2               |
| R2                                      | 19.3 | 23.8       | 29.3 | 24.2       | -7.6               |
| Mean $\pm 1.46$                         | 23.7 | 26.1       | 28.7 | 26.2       |                    |
| Effect of spraying<br>$\pm 2.91^{(1)}$  | -7.5 | -6.6       | -7.5 |            |                    |

(1) S.E. only for comparison between effects.

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K/26

Wheat - Little Knott 1946-48

1947

Percentage Eyespot at harvest

|                    | R0   | R1   | R2   | Mean | Effect of spraying |
|--------------------|------|------|------|------|--------------------|
| D0                 | 23.1 | 23.1 | 19.1 | 21.8 | -3.1               |
| D1                 | 26.8 | 18.0 | 16.8 | 20.3 | -4.0               |
| D2                 | 19.8 | 15.3 | 14.5 | 16.4 | -2.0               |
|                    | NO   | N1   | N2   |      |                    |
| D0                 | 17.7 | 22.9 | 24.7 |      |                    |
| D1                 | 16.9 | 21.8 | 22.6 |      |                    |
| D2                 | 14.0 | 13.8 | 21.9 |      |                    |
| R0                 | 21.3 | 21.9 | 26.4 | 23.2 | -6.3               |
| R1                 | 17.1 | 20.0 | 18.9 | 18.7 | -1.0               |
| R2                 | 10.9 | 16.3 | 23.9 | 16.8 | -2.8               |
| Mean               | 16.2 | 19.4 | 23.1 | 19.5 |                    |
| Effect of spraying | -2.8 | -2.5 | -3.8 |      |                    |

Percentage Area Covered by Weeds

|                    | R0    | R1    | R2    | Mean | Effect of spraying |
|--------------------|-------|-------|-------|------|--------------------|
| D0                 | 70.0  | 53.3  | 49.2  | 57.5 | -47.2              |
| D1                 | 78.3  | 41.7  | 40.8  | 53.6 | -38.3              |
| D2                 | 57.5  | 61.7  | 42.5  | 53.9 | -40.0              |
|                    | NO    | N1    | N2    |      |                    |
| D0                 | 45.0  | 65.8  | 61.7  |      |                    |
| D1                 | 45.8  | 55.0  | 60.0  |      |                    |
| D2                 | 37.5  | 62.5  | 61.7  |      |                    |
| R0                 | 56.7  | 74.2  | 75.0  | 68.6 | -31.7              |
| R1                 | 36.7  | 60.0  | 60.0  | 52.2 | -48.9              |
| R2                 | 35.0  | 49.2  | 48.3  | 44.2 | -45.0              |
| Mean               | 42.8  | 61.1  | 61.1  | 55.0 |                    |
| Effect of spraying | -30.0 | -44.4 | -51.1 |      |                    |

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K/27

# WINTER WHEAT AND BARLEY

## Woburn Stackyard, Series C, 1944-46

Control of "Take-All" (*Ophiobolus*)

Design; 4 randomized blocks of 12 plots each, certain interactions being confounded with block differences.

Area of each plot: 0.02 acre

Crops; Winter wheat in 1944, barley in 1945 and 1946.

### Treatments

Inoculations: None, inoculated with "Take-All" in December 1943.

Time of ploughing: Early (early autumn) and late - (February) with stubble cleaning during winter where trefoil was not grown.

Straw: None, 30 cwt. per acre ploughed in on plots which were ploughed early.

Trefoil: None, trefoil undersown in preceding crop on plots which were to be ploughed late.

Sulphate of ammonia: None, 0.4 cwt. N per acre applied either to trefoil soon after preceding corn crop was cut or to straw when ploughed in.

None, 0.4 cwt. N per acre applied to present crop at sowing (as top dressing in 1944 only).

Superphosphate and sulphate of potash: 0.4 cwt.  $P_2O_5$  per acre and 0.5 cwt.  $K_2O$  per acre, applied to blocks 1 and 3 at sowing time.

Of the above treatments the wheat crop in 1944 received only three: inoculation with "Take-All", late application of sulphate of ammonia (as a top dressing) and application of superphosphate and sulphate of potash (in seed-bed).

Basal manuring: 8 cwt. per acre carbonate of lime.

### Crop Notes

|             | Sown    | Harvested | Variety        | Trefoil undersown |
|-------------|---------|-----------|----------------|-------------------|
| 1944 Wheat  | 24.9.43 | Aug.9     | Red Standard   | May 15            |
| 1945 Barley | Mar.2   | Aug.10    | Plumage Archer | Mar.2             |
| 1946 Barley | Mar.19  | Aug.23    | Plumage Archer |                   |

Previous year, Fallow (the experiment was begun in 1943 season but was ploughed up on account of weeds)

Standard errors per plot:

Wheat 1944: grain, 2.70 cwt. per acre or 15.2%, 36 d.f.  
straw, 7.13 " " " " 16.1%, 36 d.f.

Barley 1945 grain, 1.88 cwt. per acre or 15.2%, 14 d.f.  
straw, 2.51 " " " " 17.3%, 14 d.f.  
Transformed % Take-All, 7.53, 14 d.f.

Barley 1946 grain, 1.40 cwt. per acre or 14.7%, 14 d.f.  
Transformed % Take-All, 6.72, 14 d.f.

K/28

Winter Wheat and Barley, 1944-46

| Differential Responses                             |             |          |       |             |       |            |       |       |       |
|----------------------------------------------------|-------------|----------|-------|-------------|-------|------------|-------|-------|-------|
|                                                    | Mean effect | Ploughed |       | Inoculation |       | N          |       | PK    |       |
|                                                    |             | Early    | Late  | Abs.        | Pres. | Abs.       | Pres. | Abs.  | Pres. |
| 1944 Wheat Grain, cwt. per acre. Mean yield, 17.7  |             |          |       |             |       |            |       |       |       |
|                                                    | $\pm 0.78$  |          |       |             |       | $\pm 1.10$ |       |       |       |
| Inoculation                                        | -0.3        |          |       | -           | -     | -1.9       | 1.4   | -0.8  | 0.2   |
| N top-dressing                                     | 2.3         |          |       | 0.6         | 3.9   | -          | -     | 3.3   | 1.3   |
| 1944 Wheat Straw, cwt. per acre. Mean yield, 44.3  |             |          |       |             |       |            |       |       |       |
|                                                    | $\pm 2.06$  |          |       |             |       | $\pm 2.91$ |       |       |       |
| Inoculation                                        | 2.9         |          |       | -           | -     | 0.4        | 5.4   | 2.5   | 3.1   |
| N top-dressing                                     | 4.0         |          |       | 1.5         | 6.4   | -          | -     | 6.1   | 1.9   |
| 1945 Barley Grain, cwt. per acre. Mean yield, 12.3 |             |          |       |             |       |            |       |       |       |
|                                                    | $\pm 0.54$  |          |       |             |       | $\pm 0.77$ |       |       |       |
| Late-early plough.                                 | 3.7         | -        |       | 2.6         | 4.8   | 4.6        | 2.7   | 3.0   | 4.3   |
| Inoculation                                        | 0.8         | -0.3     | 1.8   | -           | -     | 0.8        | 0.8   | 0.9   | 0.7   |
| N at sowing                                        | 5.1         | 6.1      | 4.2   | 5.1         | 5.1   | -          | -     | 4.9   | 5.2   |
| 1945 Barley Straw, cwt. per acre. Mean yield, 14.5 |             |          |       |             |       |            |       |       |       |
|                                                    | $\pm 0.72$  |          |       |             |       | $\pm 1.03$ |       |       |       |
| Late-early plough.                                 | 2.2         | -        | -     | 1.8         | 2.5   | 3.4        | 0.8   | 2.0   | 2.3   |
| Inoculation                                        | 0.3         | 0.0      | 0.7   | -           | -     | 0.1        | 0.5   | -0.8  | 1.5   |
| N at sowing                                        | 4.9         | 6.2      | 3.6   | 4.7         | 5.1   | -          | -     | 5.0   | 4.8   |
| 1945 Barley. Transformed % Take-All. Mean, 31.7    |             |          |       |             |       |            |       |       |       |
|                                                    | $\pm 2.17$  |          |       |             |       | $\pm 3.07$ |       |       |       |
| Late-early plough.                                 | -6.3        | -        | -     | -4.5        | -8.0  | -6.1       | -6.4  | -12.3 | -0.2  |
| Inoculation                                        | 3.4         | 5.1      | 1.6   | -           | -     | 1.9        | 4.9   | 3.7   | 3.1   |
| N at sowing                                        | -13.5       | -13.3    | -13.6 | -15.0       | -12.0 | -          | -     | -12.0 | -15.0 |
| 1945 Barley. Percentage Take-All. Mean, 28         |             |          |       |             |       |            |       |       |       |
| Late-early plough.                                 | -10         | -        | -     | 6           | -13   | -10        | -8    | -19   | 0     |
| Inoculation                                        | 5           | 9        | 2     | -           | -     | 3          | 6     | 6     | 5     |
| N at sowing                                        | -21         | -22      | -20   | -22         | -19   | -          | -     | -19   | -22   |
| 1946 Barley Grain, cwt. per acre. Mean yield, 9.5  |             |          |       |             |       |            |       |       |       |
|                                                    | $\pm 0.40$  |          |       |             |       | $\pm 0.57$ |       |       |       |
| Late-early plough.                                 | 3.9         | -        | -     | 3.8         | 4.0   | 3.4        | 4.4   | 2.5   | 5.3   |
| Inoculation                                        | -0.5        | -0.6     | -0.5  | -           | -     | -1.2       | 0.1   | -0.9  | -0.2  |
| N at sowing                                        | 3.4         | 2.9      | 3.9   | 2.7         | 4.1   | -          | -     | 3.3   | 3.5   |
| 1946 Barley. Transformed % Take-All. Mean, 33.0    |             |          |       |             |       |            |       |       |       |
|                                                    | $\pm 1.94$  |          |       |             |       | $\pm 2.74$ |       |       |       |
| Late-early plough.                                 | -0.2        | -        | -     | 1.8         | -2.4  | 3.6        | -4.0  | -2.8  | 2.4   |
| Inoculation                                        | -1.4        | 0.7      | -3.5  | -           | -     | -1.6       | -1.2  | -3.6  | 0.9   |
| N at sowing                                        | -7.2        | -3.4     | -11.0 | -7.4        | -7.0  | -          | -     | -7.6  | -6.7  |
| 1946 Barley. Percentage Take-All. Mean, 30         |             |          |       |             |       |            |       |       |       |
| Late-early plough.                                 | 0           | -        | -     | 3           | -3    | 6          | -6    | -5    | 4     |
| Inoculation                                        | -2          | 1        | -5    | -           | -     | -3         | -2    | -6    | 2     |
| N at sowing                                        | -12         | -6       | -18   | -12         | -11   | -          | -     | -13   | -11   |

| Differential Responses              |                    |                  |                  |                      |                    |                    | K/29 |
|-------------------------------------|--------------------|------------------|------------------|----------------------|--------------------|--------------------|------|
|                                     | Ploughed early     |                  |                  | Ploughed late        |                    |                    |      |
|                                     | No straw<br>or S/A | Straw<br>and S/A | Straw<br>and S/A | No trefoil<br>or S/A | Trefoil<br>and S/A | Trefoil<br>and S/A |      |
| 1945 Barley Grain, cwt. per acre    |                    |                  |                  |                      |                    |                    |      |
|                                     |                    | $\pm 1.33$       |                  |                      | $\pm 1.33$         |                    |      |
| Inoculation                         | -1.1               | -0.1             | 0.2              | 3.6                  | -0.2               | 2.0                |      |
| N at sowing                         | 6.6                | 4.9              | 6.7              | 3.6                  | 4.0                | 4.8                |      |
| PK                                  | -2.0               | -0.8             | 3.1              | -1.0                 | 2.0                | 3.2                |      |
| Mean $\pm 0.66$                     | 12.3               | 8.8              | 10.4             | 13.1                 | 14.2               | 15.3               |      |
| 1945 Barley Straw, cwt. per acre    |                    |                  |                  |                      |                    |                    |      |
|                                     |                    | $\pm 1.77$       |                  |                      | $\pm 1.77$         |                    |      |
| Inoculation                         | 0.4                | -0.4             | 0.0              | 1.3                  | -0.9               | 1.3                |      |
| N at sowing                         | 5.6                | 6.4              | 6.8              | 3.0                  | 3.9                | 3.7                |      |
| PK                                  | -1.3               | 0.0              | 2.7              | -1.2                 | 1.1                | 2.2                |      |
| Mean $\pm 0.89$                     | 14.4               | 12.6             | 13.2             | 15.1                 | 15.0               | 16.5               |      |
| 1945 Barley. Transformed % Take-All |                    |                  |                  |                      |                    |                    |      |
|                                     |                    | $\pm 5.32$       |                  |                      | $\pm 5.32$         |                    |      |
| Inoculation                         | 0.3                | 6.9              | 8.1              | -0.1                 | 4.5                | 0.5                |      |
| N at sowing                         | -11.5              | -11.9            | -16.5            | -9.3                 | -14.0              | -17.6              |      |
| PK                                  | -16.0              | -9.6             | -2.0             | 6.1                  | -6.9               | 9.4                |      |
| Mean $\pm 2.66$                     | 33.2               | 38.6             | 32.6             | 34.4                 | 24.4               | 26.8               |      |
| 1945 Barley. Percentage Take-All    |                    |                  |                  |                      |                    |                    |      |
| Inoculation                         | 0                  | 12               | 13               | 0                    | 6                  | 1                  |      |
| N at sowing                         | -19                | -20              | -26              | -15                  | -18                | -24                |      |
| PK                                  | -25                | -16              | -3               | 10                   | -9                 | 14                 |      |
| Mean                                | 30                 | 39               | 29               | 32                   | 17                 | 20                 |      |
| 1946 Barley Grain, cwt. per acre    |                    |                  |                  |                      |                    |                    |      |
|                                     |                    | $\pm 0.99$       |                  |                      | $\pm 0.99$         |                    |      |
| Inoculation                         | -1.0               | -1.0             | 0.1              | 0.5                  | -0.6               | -1.3               |      |
| N at sowing                         | 3.7                | 3.7              | 1.3              | 6.1                  | 3.2                | 2.3                |      |
| PK                                  | 1.1                | 0.4              | 0.9              | 2.4                  | 4.5                | 3.9                |      |
| Mean $\pm 0.49$                     | 6.5                | 6.3              | 10.0             | 7.6                  | 12.5               | 14.2               |      |
| 1946 Barley. Transformed % Take-All |                    |                  |                  |                      |                    |                    |      |
|                                     |                    | $\pm 4.75$       |                  |                      | $\pm 4.75$         |                    |      |
| Inoculation                         | 5.0                | 0.0              | -3.0             | -8.2                 | -1.0               | -1.3               |      |
| N at sowing                         | -3.0               | -7.2             | 0.0              | -9.9                 | -11.9              | -9.3               |      |
| PK                                  | -4.8               | -8.4             | -8.4             | -4.1                 | -4.3               | 2.5                |      |
| Mean $\pm 2.38$                     | 34.3               | 36.3             | 28.8             | 36.2                 | 30.5               | 32.0               |      |
| 1946 Barley. Percentage Take-All    |                    |                  |                  |                      |                    |                    |      |
| Inoculation                         | 8                  | 0                | -4               | -14                  | -1                 | -2                 |      |
| N at sowing                         | -5                 | -12              | 0                | -16                  | -18                | -17                |      |
| PK                                  | -8                 | -14              | -13              | -6                   | -7                 | 4                  |      |
| Mean                                | 32                 | 35               | 23               | 35                   | 26                 | 28                 |      |

The PK main effect was confounded with blocks. Standard errors quoted for PK effects are for use in comparisons only.



1943  
Straw: cwt. per acre

K/31

|                          |       | Cwt. P <sub>2</sub> O <sub>5</sub> per acre |      |      |                   | With-        | With  |
|--------------------------|-------|---------------------------------------------|------|------|-------------------|--------------|-------|
|                          |       | 0                                           | 0.3  | 0.6  | Mean              | out<br>Chalk | Chalk |
| Basic slag               | ±1.64 |                                             | 43.3 | 41.6 | 42.4 <sup>d</sup> | 43.0         | 41.9  |
| Triple super. (powdered) | ±1.16 |                                             | 42.9 | 45.4 | 44.2 <sup>e</sup> | 45.7         | 42.6  |
| Triple super (granular)  | ±1.16 |                                             | 44.3 | 47.6 | 46.0 <sup>e</sup> | 47.4         | 44.4  |
| Mean                     | ±0.74 | 39.2 <sup>d</sup>                           | 43.5 | 45.5 | 43.7              | -            | -     |
| Without chalk            | ±1.04 | 42.6 <sup>f</sup>                           | 45.9 | 45.8 | -                 | -            | -     |
| With chalk               |       | 35.9 <sup>f</sup>                           | 41.2 | 45.3 | -                 | -            | -     |

| Triple Super. | Powdered | Granular | Cwt. P <sub>2</sub> O <sub>5</sub> per acre |      | Mean  |
|---------------|----------|----------|---------------------------------------------|------|-------|
|               |          |          | 0.3                                         | 0.6  | ±0.82 |
| Broadcast     | 45.2     | 44.8     | 43.0                                        | 47.0 | 45.0  |
| Drilled       | 43.1     | 47.1     | 44.2                                        | 46.0 | 45.1  |
| Mean          | 44.2     | 46.0     | 43.6                                        | 46.5 | 45.0  |

Standard errors

(d) 1.16 (e) 0.82 (f) 1.64

Note: Standard errors referring to "with and without chalk" apply to interactions only and not to main effects of chalk.

1944

|                                             | None            | Super.<br>Powd. | Gran.         | Basic<br>Slag | Mean  |                   |
|---------------------------------------------|-----------------|-----------------|---------------|---------------|-------|-------------------|
| Grain: cwt. per acre                        |                 | ±0.71           |               |               | ±0.41 |                   |
| Broadcast                                   |                 | 20.8            | 20.9          | 20.4          | 20.7  |                   |
| Drilled                                     |                 | 23.4            | 22.8          | 22.1          | 22.7  |                   |
| Cwt. P <sub>2</sub> O <sub>5</sub> per acre |                 |                 |               |               |       | Broadcast drilled |
| 0.3                                         |                 | 21.4            | 21.8          | 20.1          | 21.1  | 19.8 ±0.58 22.4   |
| 0.6                                         |                 | 22.8            | 22.0          | 22.4          | 22.4  | 21.7 23.0         |
| Mean                                        | 19.4<br>(±0.71) | 22.1            | 21.9          | 21.2          | 21.4  |                   |
| Straw: cwt. per acre                        |                 | ±1.06           |               |               | ±0.61 |                   |
| Broadcast                                   |                 | 37.7            | 37.8          | 38.8          | 38.1  |                   |
| Drilled                                     |                 | 42.3            | 43.2          | 39.6          | 41.7  |                   |
| Cwt. P <sub>2</sub> O <sub>5</sub> per acre |                 |                 |               |               |       | Broadcast drilled |
|                                             |                 |                 |               |               |       | ±0.86             |
| 0.3                                         |                 | 38.6            | 39.9          | 38.1          | 38.9  | 36.4 41.4         |
| 0.6                                         |                 | 41.4            | 41.2          | 40.4          | 41.0  | 39.8 42.2         |
| Mean                                        | 34.9<br>(±1.06) | 40.0            | 40.5<br>±0.75 | 39.2          | 39.2  |                   |

A similar experiment was carried out on white turnips in 1942 on Deacon's Field, but the results are unreliable owing to the late sowing of the crop.

K/32

## SPRING SOWN CEREALS

Long Hoos V, 1947

Comparison of barley, spring oats and two varieties of wheat, and of the effects on them of four levels of sulphate of ammonia, of superphosphate and of muriate of potash.  
Similar experiments were made in 1948 and 1949.

Design; 4 randomized blocks of four plots each, each plot being split into 4, crop differences and certain first-order interactions of artificials being confounded with differences between whole plots.

Area of each sub-plot; 0.0150 acre.

### Treatments

Crops: Oats (S.84), wheat (Atle and Bersee) and barley (Plumage Archer).

Sulphate of ammonia: None, 0.3, 0.6, 0.9 cwt. N per acre.

Superphosphate : None, 0.6 cwt. P<sub>2</sub>O<sub>5</sub> per acre.

Muriate of potash: None, 0.6 cwt. K<sub>2</sub>O per acre

### Crop Notes

All seed drilled: April 12. Harvested: oats, Aug. 7;  
barley, Aug. 12; Atle wheat, Aug. 18; Bersee wheat, Aug. 20.  
Previous crop: Beans.

Standard errors: Grain

per whole plot, 1.26 cwt. per acre or 4.8%, 6 d.f.

per sub-plot, 1.30 cwt. per acre or 5.0%, 24 d.f.

K/33

|                     | Grain: cwt. per acre |              |                |        | Straw: cwt. per acre |              |                |        |
|---------------------|----------------------|--------------|----------------|--------|----------------------|--------------|----------------|--------|
|                     | Oats                 | Wheat (Atle) | Wheat (Bersee) | Barley | Oats                 | Wheat (Atle) | Wheat (Bersee) | Barley |
| Mean                | 26.0                 | 22.5         | 27.2           | 29.2   | 37.7                 | 27.5         | 33.5           | 28.7   |
| Sulphate of ammonia |                      | (a) and (b)  |                |        |                      |              |                |        |
| None                | 20.5                 | 19.1         | 23.9           | 26.3   | 31.6                 | 21.9         | 25.3           | 24.8   |
| 0.3 cwt. N per acre | 25.2                 | 22.1         | 26.7           | 29.3   | 38.2                 | 26.6         | 32.0           | 28.1   |
| 0.6 cwt. N per acre | 28.3                 | 24.2         | 29.0           | 31.3   | 38.9                 | 30.4         | 36.4           | 30.7   |
| 0.9 cwt. N per acre | 29.9                 | 24.5         | 29.1           | 30.0   | 42.1                 | 20.9         | 40.3           | 31.3   |
|                     |                      | $\pm 0.65$   |                |        |                      |              |                |        |
| Response to F       | 1.8                  | -0.7         | 1.2            | 1.0    | 0.6                  | -0.7         | 0.3            | 0.6    |
| Response to K       | 0.3                  | -1.1         | 0.8            | 2.4    | -0.3                 | -0.6         | 0.2            | 1.7    |

Standard Errors (a)  $\pm 0.65$  for vertical comparisons only

(b)  $\pm 0.85$  for all other comparisons