

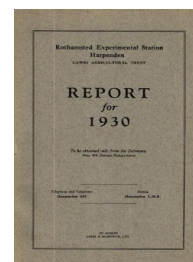
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## Report for 1930

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## Experiments at Other Centres

### Rothamsted Research

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# REPLICATED EXPERIMENTS AT OUTSIDE CENTRES

## Grassland. Meadow Hay.

(Basic Slag Committee).

Mr. W. Eydes, Walton Lodge Farm, Walton, Chesterfield,  
Derby, 1930.

### Permanent grass.

|      |   |   |   |   |   |
|------|---|---|---|---|---|
| I.   | H | L | M | O | S |
| II.  | M | H | O | S | L |
| III. | S | O | L | M | H |
| IV.  | L | M | S | H | O |
| V.   | O | S | H | L | M |

SYSTEM OF REPLICATION: Latin Square

AREA OF EACH PLOT: 1/15 acre.

Soil: Clay 6 in. deep.

TREATMENTS:

O=Control.

S=Super.

M=Mineral Phosphate.

L=Low Soluble Slag (23.0%).

H=High soluble Slag (96.5%).

Dressings providing 1 cwt.  $P_2O_5$  per acre, applied Feb. 4th.

Hay cut: July 15th. Weighed: Aug. 7th-8th.

### Actual weights in lb.

| Row.    | O   | M   | L   | H   | S   |
|---------|-----|-----|-----|-----|-----|
| I. ..   | 175 | 183 | 165 | 152 | 203 |
| II. ..  | 217 | 179 | 225 | 226 | 225 |
| III. .. | 197 | 224 | 236 | 235 | 186 |
| IV. ..  | 231 | 210 | 216 | 254 | 292 |
| V. ..   | 207 | 186 | 204 | 177 | 234 |

### Summary of Results

| Average Yield. | Control. | Mineral Phosphate. | Low Sol. Slag. | High Sol. Slag. | Super-Phosphate. | Mean. | Standard Error. |
|----------------|----------|--------------------|----------------|-----------------|------------------|-------|-----------------|
| Cwt. per acre  | 27.5     | 26.3               | 28.0           | 28.0            | 30.5             | 28.1  | 1.28            |
| Per cent. ..   | 98.0     | 93.7               | 99.8           | 99.6            | 108.8            | 100.0 | 4.54            |

The response to the dressings of mineral phosphate and high and low soluble slags are not significant. The plots treated with superphosphate give a significantly higher yield than any of the others.

**Grassland. Meadow Hay.**

(Basic Slag Committee).

Mr. W. H. Limbrick, Badminton Farm, Badminton, Glos., 1930.

**Permanent grass.**

|      |   |   |   |   |   |
|------|---|---|---|---|---|
| I.   | S | O | L | M | H |
| II.  | M | L | H | O | S |
| III. | O | H | M | S | L |
| IV.  | H | S | O | L | M |
| V.   | L | M | S | H | O |

SYSTEM OF REPLICATION: Latin Square.

AREA OF EACH PLOT: 1/10th acre.

Soil: Light red loam 8 in. deep.

TREATMENTS:

O=Control.

S=Super.

M=Ground Mineral Phosphate.

L=Low soluble Slag (23.0%).

H=High soluble Slag (96.5%).

Dressings providing 1 cwt.  $P_2O_5$  per acre, applied Jan. 31st-Feb. 1st.

Hay cut: June 16th. Weighed: June 20th-24th.

**Actual weights in lb.**

| Row.    | Hay as weighed. |     |     |     |     | Air dry weights. |     |     |     |     |
|---------|-----------------|-----|-----|-----|-----|------------------|-----|-----|-----|-----|
|         | O               | M   | L   | H   | S   | O                | M   | L   | H   | S   |
| I. ..   | 442             | 420 | 422 | 403 | 512 | 345              | 335 | 333 | 299 | 380 |
| II. ..  | 472             | 402 | 446 | 478 | 490 | 362              | 332 | 355 | 368 | 380 |
| III. .. | 479             | 520 | 489 | 504 | 553 | 379              | 388 | 374 | 395 | 420 |
| IV. ..  | 551             | 434 | 494 | 514 | 559 | 451              | 383 | 412 | 413 | 449 |
| V. ..   | 458             | 547 | 489 | 516 | 497 | 337              | 439 | 410 | 421 | 382 |

**Summary of Results.**

| Average yield.   | Control. | Mineral Ph'phate. | Low Sol. Slag. | High Sol. Slag. | Super-ph'phate. | Mean. | Standard Error. |
|------------------|----------|-------------------|----------------|-----------------|-----------------|-------|-----------------|
| Hay as weighed—  |          |                   |                |                 |                 |       |                 |
| Cwt. per acre .. | 42.9     | 41.5              | 41.8           | 43.1            | 46.6            | 43.2  | 1.33            |
| Per cent. ..     | 99.3     | 96.1              | 96.8           | 99.9            | 108.0           | 100.0 | 3.07            |
| Air dry weights— |          |                   |                |                 |                 |       |                 |
| Cwt. per acre .. | 33.5     | 33.5              | 33.6           | 33.9            | 35.9            | 34.1  | 1.01            |
| Per cent. ..     | 98.2     | 98.4              | 98.7           | 99.4            | 105.4           | 100.0 | 2.96            |

There has been no response to the slags, or to mineral phosphate. The yield of hay as weighed in the field was significantly increased by the dressing of superphosphate. This increase, when expressed as air-dried hay was, however, much smaller, and hardly significant.

# Barley: Effect of Nitrogenous Fertilisers, and of Sulphate of Potash and Superphosphate.

H. G. Nevile, Esq., Wellingore, 1930.

Plan and Actual Weights in grams per sample.

| Grain |      |      |      |      |      |      |      | Straw |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|------|
| K     | KP   | K    | KP   | KP   | O    | P    | K    | K     | KP   | K    | KP   | KP   | O    | P    | K    |
| 172   | 265  | 177  | 214  | 262½ | 213½ | 124  | 115  | 211   | 280½ | 179½ | 234  | 320½ | 246½ | 144½ | 159½ |
| P     | O    | O    | P    | K    | P    | O    | KP   | P     | O    | O    | P    | K    | P    | O    | KP   |
| 159   | 159  | 159  | 129  | 196½ | 219½ | 184½ | 124  | 177   | 161  | 192  | 160½ | 261  | 291  | 226  | 161½ |
| P     | K    | K    | P    | K    | P    | KP   | P    | P     | K    | K    | P    | K    | P    | KP   | P    |
| 128   | 182  | 236½ | 182½ | 116  | 146  | 196½ | 199½ | 148½  | 229  | 250  | 201½ | 133½ | 159½ | 234  | 253  |
| KP    | O    | KP   | O    | KP   | O    | K    | O    | KP    | O    | KP   | O    | KP   | O    | K    | O    |
| 188   | 179½ | 183  | 156  | 98½  | 134  | 209½ | 170½ | 216½  | 193  | 208½ | 173½ | 122  | 181½ | 237½ | 216  |
| O     | KP   | KP   | P    | P    | O    | KP   | O    | O     | KP   | KP   | P    | P    | O    | KP   | O    |
| 107½  | 134  | 167½ | 196½ | 189½ | 144½ | 195½ | 159½ | 64    | 134½ | 194½ | 222½ | 214½ | 180½ | 271½ | 204½ |
| P     | K    | K    | O    | KP   | K    | P    | K    | P     | K    | K    | O    | KP   | K    | P    | K    |
| 119½  | 118  | 134  | 149  | 191  | 207½ | 190  | 214½ | 125½  | 115½ | 147½ | 166½ | 205  | 223½ | 210  | 250½ |
| P     | KP   | K    | P    | P    | KP   | K    | O    | P     | KP   | K    | P    | P    | KP   | K    | O    |
| 191   | 153½ | 103½ | 90   | 180  | 225  | 198½ | 223½ | 201½  | 162  | 99   | 99½  | 216  | 255½ | 201½ | 237  |
| O     | K    | KP   | O    | K    | O    | KP   | P    | O     | K    | KP   | O    | K    | O    | KP   | P    |
| 155   | 170½ | 97   | 80   | 153  | 172½ | 212½ | 165½ | 167   | 172½ | 103  | 84½  | 186½ | 222  | 226  | 210½ |

Plan showing Nitrogenous Treatments applied to whole plots.

SYSTEM OF REPLICATION: Latin Square.  
AREA OF EACH WHOLE PLOT: 1/50th acre.  
Soil: Light loam on Oolitic limestone.

TREATMENTS:  
O = No Nitrogen.  
C = Cyanamide.  
N = Nitrate of Soda.  
S = Sulphate of Ammonia } at the rate of 0.2 cwt. N per acre.

| N | C | S | O |
|---|---|---|---|
| S | N | O | C |
| O | S | C | N |
| C | O | N | S |

Plots sub-divided to receive no Potash or Superphosphate (O), Sulphate of Potash (K) at the rate of 0.6 cwt.  $K_2O$  per acre, Superphosphate (P) at the rate of 0.4 cwt.  $P_2O_5$  per acre, and Sulphate of Potash and Superphosphate (KP).

Plots harvested by sampling method.

Manures applied: March 10th.

Barley sown: March 10th. Harvested: August 22nd.

Variety: Plumage Archer.

Previous Crop: Barley.

## Barley, Wellingore, 1930 (cont.)

## Summary of Results.

| Average Yield in cwt.<br>per acre. | Grain          |                |                    |                |       | Straw          |                |                    |                 |       |
|------------------------------------|----------------|----------------|--------------------|----------------|-------|----------------|----------------|--------------------|-----------------|-------|
|                                    | No<br>Nitrogen | Cyana-<br>mide | Nitrate<br>of Soda | Sulph.<br>Amm. | Mean  | No<br>Nitrogen | Cyana-<br>mide | Nitrate<br>of Soda | Sulph./<br>Amm. | Mean  |
| No Potash or Super.                | 11.0           | 13.7           | 14.1               | 16.7           | 13.9  | 12.1           | 16.5           | 16.6               | 18.4            | 15.9  |
| Sulphate of Potash ..              | 9.9            | 16.7           | 16.9               | 15.5           | 14.8  | 11.1           | 17.7           | 19.6               | 18.3            | 16.7  |
| Superphosphate ..                  | 10.4           | 15.4           | 15.5               | 15.5           | 14.2  | 11.5           | 18.1           | 17.5               | 19.0            | 16.5  |
| Potash and Super. ..               | 9.9            | 16.4           | 18.9               | 18.1           | 15.8  | 11.3           | 18.2           | 22.1               | 20.9            | 18.1  |
| Mean .. ..                         | 10.3           | 15.6           | 16.4               | 16.4           | 14.7  | 11.5           | 17.6           | 19.0               | 19.2            | 16.8  |
| Standard Error ..                  | 1.14           |                |                    |                |       | 1.25           |                |                    |                 |       |
| Per cent.                          |                |                |                    |                |       |                |                |                    |                 |       |
| No Potash or Super.                | 75.2           | 93.5           | 96.1               | 113.7          | 94.6  | 72.1           | 98.0           | 98.7               | 109.3           | 94.6  |
| Sulphate of Potash ..              | 67.2           | 113.6          | 115.3              | 105.6          | 100.4 | 65.8           | 105.4          | 116.5              | 108.8           | 99.1  |
| Superphosphate ..                  | 71.2           | 105.3          | 105.7              | 105.4          | 96.9  | 68.6           | 107.6          | 104.3              | 113.1           | 98.4  |
| Potash and Super. ..               | 67.4           | 112.2          | 129.0              | 123.4          | 108.0 | 67.6           | 108.3          | 131.8              | 124.2           | 108.0 |
| Mean .. ..                         | 70.2           | 106.2          | 111.6              | 112.0          | 100.0 | 68.6           | 104.8          | 112.8              | 113.8           | 100.0 |
| Standard Error ..                  | 7.78           |                |                    |                |       | 7.44           |                |                    |                 |       |

Significant response to all forms of nitrogenous fertiliser for both grain and straw, but the differences between the yields of plots having sulphate of ammonia, nitrate of soda and cyanamide are not significant. The response to potash is significant for grain, but only in the presence of a nitrogenous dressing: while that to phosphate is not significant for either grain or straw.

# Barley: Effect of Nitrogenous Fertilisers, and of Sulphate of Potash and Superphosphate.

Mr. J. M. Templeton, Farm Institute, Sparsholt, Winchester, 1930.

Plan and Actual Weights in grams per sample.

| Grain |      |      |      |      |      |      |      | Straw |      |      |      |      |      |      |      |
|-------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|------|
| P     | KP   | O    | P    | K    | KP   | K    | KP   | P     | KP   | O    | P    | K    | KP   | K    | KP   |
| 219   | 186½ | 162½ | 132½ | 146  | 161  | 152  | 90½  | 223½  | 185½ | 174  | 152½ | 161½ | 192½ | 136  | 105  |
| O     | K    | K    | KP   | O    | P    | P    | O    | O     | K    | K    | KP   | O    | P    | P    | O    |
| 174½  | 188½ | 165  | 164  | 131  | 192  | 147  | 163  | 167½  | 180½ | 138  | 158½ | 148½ | 193½ | 152½ | 145  |
| KP    | O    | O    | KP   | O    | KP   | KP   | P    | KP    | O    | O    | KP   | O    | KP   | KP   | P    |
| 209½  | 240½ | 171  | 219  | 140  | 209  | 234½ | 159½ | 206½  | 241  | 173  | 206  | 157  | 177½ | 218½ | 153  |
| K     | P    | P    | K    | P    | K    | K    | O    | K     | P    | P    | K    | P    | K    | K    | O    |
| 203   | 259  | 207  | 151  | 205  | 206  | 183  | 201  | 204   | 245  | 186½ | 142  | 207  | 194½ | 185½ | 196½ |
| P     | O    | P    | KP   | K    | P    | KP   | P    | P     | O    | P    | KP   | K    | P    | KP   | P    |
| 236½  | 203  | 160½ | 191  | 177  | 172½ | 185  | 133½ | 229½  | 197  | 150½ | 157½ | 178½ | 167  | 168  | 135½ |
| KP    | K    | O    | K    | KP   | O    | K    | O    | KP    | K    | O    | K    | KP   | O    | K    | O    |
| 257½  | 207½ | 160½ | 176½ | 170½ | 163  | 173  | 156½ | 249½  | 210  | 152½ | 171½ | 176  | 173½ | 171½ | 161½ |
| P     | KP   | K    | O    | P    | KP   | O    | P    | P     | KP   | K    | O    | P    | KP   | O    | P    |
| 249½  | 220½ | 215½ | 232½ | 150  | 183  | 163½ | 126  | 229   | 231½ | 213  | 228  | 163½ | 179½ | 154½ | 135½ |
| O     | K    | KP   | P    | K    | O    | KP   | K    | O     | K    | KP   | P    | K    | O    | KP   | K    |
| 259   | 230  | 245  | 262  | 175  | 207½ | 174½ | 102  | 240½  | 215  | 243  | 248  | 147  | 206  | 160½ | 130  |

Plan showing Nitrogenous Treatments applied to whole plots.

SYSTEM OF REPLICATION: Latin Square.  
 AREA OF EACH WHOLE PLOT: 1/50th acre.  
 Soil: Thin flinty loam on chalk.  
 Variety: Plumage Archer.

## TREATMENTS:

O=No Nitrogen.  
 C=Cyanamide.  
 N=Nitrate of Soda.  
 S=Sulphate of Ammonia.

} at the rate  
 of 0.2 cwt.  
 N per acre.

| O | C | N | S |
|---|---|---|---|
| C | S | O | N |
| N | O | S | C |
| S | N | C | O |

Plots sub-divided to receive no Potash or Superphosphate (O), Sulphate of Potash (K), at the rate of 0.6 cwt.  $K_2O$  per acre, Superphosphate (P) at the rate of 0.4 cwt.  $P_2O_5$  per acre, and Sulphate of Potash and Superphosphate (KP).

Plots harvested by sampling method.

Manures applied: March 25th-26th.

Barley sown: April 15th. Harvested: August 12th-13th.

Previous Crop: Barley.

## Barley, Sparsholt, 1930 (cont.)

## Summary of Results.

| Average Yield in cwt.<br>per acre. | Grain.         |                |                    |                 |       | Straw.         |                |                    |                 |       |
|------------------------------------|----------------|----------------|--------------------|-----------------|-------|----------------|----------------|--------------------|-----------------|-------|
|                                    | No<br>Nitrogen | Cyana-<br>mide | Nitrate<br>of Soda | Sulph./<br>Amm. | Mean  | No<br>Nitrogen | Cyana-<br>mide | Nitrate<br>of Soda | Sulph./<br>Amm. | Mean  |
| No Potash or Super.                | 11.9           | 14.3           | 14.3               | 14.1            | 13.6  | 11.8           | 14.6           | 14.4               | 13.7            | 13.6  |
| Sulphate of Potash ..              | 12.6           | 13.4           | 14.0               | 13.3            | 13.3  | 12.6           | 12.3           | 14.4               | 12.5            | 13.0  |
| Superphosphate ..                  | 13.3           | 12.6           | 15.9               | 14.5            | 14.1  | 13.4           | 13.0           | 15.4               | 13.7            | 13.9  |
| Potash and Super. ..               | 14.2           | 13.8           | 16.8               | 13.1            | 14.5  | 12.7           | 13.3           | 16.9               | 13.4            | 14.1  |
| Mean .. ..                         | 13.0           | 13.5           | 15.2               | 13.8            | 13.9  | 12.6           | 13.3           | 15.3               | 13.3            | 13.6  |
| Standard Error ..                  | 0.92           |                |                    |                 |       | 0.69           |                |                    |                 |       |
| Per cent.                          |                |                |                    |                 |       |                |                |                    |                 |       |
| No Potash or Super.                | 85.9           | 103.2          | 103.3              | 101.7           | 98.5  | 86.5           | 107.2          | 105.5              | 100.3           | 99.9  |
| Sulphate of Potash ..              | 90.5           | 96.3           | 101.2              | 95.5            | 95.9  | 92.7           | 90.5           | 105.5              | 92.0            | 95.2  |
| Superphosphate ..                  | 95.6           | 90.8           | 114.4              | 104.4           | 101.3 | 98.1           | 95.4           | 112.9              | 100.7           | 101.8 |
| Potash and Super. ..               | 102.4          | 99.8           | 120.8              | 94.2            | 104.3 | 93.3           | 97.6           | 123.7              | 98.4            | 103.2 |
| Mean .. ..                         | 93.6           | 97.5           | 109.9              | 99.0            | 100.0 | 92.6           | 97.7           | 111.9              | 97.8            | 100.0 |
| Standard Error ..                  | 6.65           |                |                    |                 |       | 5.07           |                |                    |                 |       |

Plots treated with nitrate of soda have given a significantly higher yield than all others. The response to sulphate of ammonia and cyanamide was not significant. No effect of potash. There was some evidence of a response to superphosphate, but the increase only approached significance in the presence of potash and nitrate of soda.

# **Potatoes: Effect of Superphosphate on Two Varieties.** **G. Major, Esq., Newton Farm, Lincs., 1930.**

|      | B  | A  | A  | B  | B  | A  | B  | A  |
|------|----|----|----|----|----|----|----|----|
| I.   | 0  | 0  | 2½ | 2½ | 10 | 10 | 5  | 5  |
| II.  | 5  | 5  | 10 | 10 | 2½ | 2½ | 0  | 0  |
| III. | 10 | 10 | 0  | 0  | 5  | 5  | 2½ | 2½ |
| IV.  | 2½ | 2½ | 5  | 5  | 0  | 0  | 10 | 10 |

VARIETIES: British Queen (A) and King Edward (B) in random strips.

SYSTEM OF REPLICATION: Latin Square.

AREA OF EACH SUB-PLOT: 1/60th acre.

TREATMENTS: Superphosphate at the rate of 0, 2½, (0.4 cwt.  $P_2O_5$ ), 5 and 10 cwt. per acre.

All plots received Sulphate of Ammonia at the rate of 0.8 cwt. N per acre and Sulphate of Potash at the rate of 2 cwt.  $K_2O$  per acre. Dunged in previous autumn.

Manures applied: April 2nd.

Potatoes planted: April 3rd. Lifted: Oct. 21st-22nd.

Previous Crop: Wheat.

## **Actual weights in lb.**

| Row.    | British Queen. |     |     |     | King Edward. |     |     |     |
|---------|----------------|-----|-----|-----|--------------|-----|-----|-----|
|         | 0              | 2½  | 5   | 10  | 0            | 2½  | 5   | 10  |
| I. ..   | 518            | 528 | 495 | 554 | 676          | 546 | 586 | 578 |
| II. ..  | 476            | 558 | 532 | 512 | 559          | 562 | 611 | 598 |
| III. .. | 502            | 468 | 545 | 538 | 570          | 575 | 599 | 601 |
| IV. ..  | 472            | 557 | 582 | 579 | 625          | 646 | 651 | 602 |

## **Summary of Results.**

| Average yield. |    |    | British Queen.               |                |               |                | King Edward. |                |               |                |
|----------------|----|----|------------------------------|----------------|---------------|----------------|--------------|----------------|---------------|----------------|
|                |    |    | No Super.                    | 2½ cwt. Super. | 5 cwt. Super. | 10 cwt. Super. | No Super.    | 2½ cwt. Super. | 5 cwt. Super. | 10 cwt. Super. |
| Tons per acre  | .. |    | 13.18                        | 14.14          | 14.42         | 14.62          | 16.27        | 15.60          | 16.39         | 15.93          |
| Per cent.      | .. |    | 87.5                         | 93.8           | 95.7          | 97.0           | 108.0        | 103.5          | 108.7         | 105.7          |
| Mean           | .. | .. | 14.09                        |                |               |                | 16.05        |                |               |                |
| Standard Error | .. |    | 0.375 tons or 2.49 per cent. |                |               |                |              |                |               |                |

King Edwards yielded significantly better than British Queen. Significant response to British Queen variety with first dressing of superphosphate: further response to higher dressing is not significant. No response to superphosphate on King Edward variety.

# **Potatoes : Effect of Sulphate of Potash and Mineral Potash.** A. W. Oldershaw, Esq., Tunstall, Nr. Ipswich, 1930.

| C |   |   | A |   |   |
|---|---|---|---|---|---|
| K | O | S | — | S | — |
| — | — | — | K | — | O |
| O | K | — | S | — | — |
| — | — | S | — | O | K |
| D |   |   | B |   |   |

SYSTEM OF REPLICATION : 4 randomised blocks.  
AREA OF EACH WHOLE PLOT : 1/60th acre. Each plot divided into two sub-plots.  
Soil : Very light sand (almost out of cultivation).  
Variety : Great Scott.  
TREATMENTS :  
O = Control.  
S = Sulphate of Potash at the rate of 1.5 cwt.  $K_2O$  per acre.  
K = Potash Mineral equivalent to Sulphate of Potash.  
Sulphate of Magnesia, providing Magnesium equivalent to the Potash applied to one out of each pair of sub-plots, indicated by the treatment symbol occurring on that half.  
All plots received Nitrate of Soda at the rate of 0.6 cwt. N per acre, and basic Superphosphate at the rate of 0.6 cwt.  $P_2O_5$  per acre.  
Manures applied : April 1st, except Nitrate of Soda which was applied as an early top dressing.  
Potatoes planted : April 6th. Lifted : Oct. 8th-10th.

## **Actual weights in lb.**

| Block.                   | With Sulphate of Magnesia. |       |       | Without Sulphate of Magnesia. |       |       |
|--------------------------|----------------------------|-------|-------|-------------------------------|-------|-------|
|                          | O                          | S     | K     | O                             | S     | K     |
| A ..                     | 557                        | 486   | 514   | 461                           | 581   | 423   |
| B ..                     | 468                        | 547   | 491   | 418                           | 525   | 490   |
| C ..                     | 516                        | 520   | 433   | 547                           | 507   | 438   |
| D ..                     | 455                        | 447   | 508   | 459                           | 493   | 503   |
| Average in tons per acre | 13.37                      | 13.39 | 13.03 | 12.62                         | 14.10 | 12.42 |

## **Summary of Results.**

| Average Yield.   | Control. | Sulphate of Potash | Potash Mineral. | Mean. | Standard Error. | Without S/Mag. | With S/Mag. | Mean. | Standard Error. |
|------------------|----------|--------------------|-----------------|-------|-----------------|----------------|-------------|-------|-----------------|
| Tons per acre .. | 12.99    | 13.75              | 12.72           | 13.16 | 0.541           | 13.05          | 13.26       | 13.16 | 0.287           |
| Per cent.        | 98.8     | 104.5              | 96.7            | 100.0 | 4.12            | 99.2           | 100.8       | 100.0 | 2.18            |

Slight non-significant advantage due to sulphate of potash. No response to potash mineral or sulphate of magnesia.

**Potatoes : Effect of Superphosphate and Sulphate of Potash.**  
**E. V. Cooke, Esq., The Limes, North Fen, Bourne, Lincs., 1930.**

| A        |          |          | B        |          |          |
|----------|----------|----------|----------|----------|----------|
| 0P<br>2K | 1P<br>2K | 1P<br>1K | 0P<br>1K | 0P<br>2K | 1P<br>1K |
| 2P<br>1K | 0P<br>1K | 2P<br>0K | 2P<br>0K | 1P<br>0K | 2P<br>1K |
| 1P<br>0K | 2P<br>2K | 0P<br>0K | 1P<br>2K | 2P<br>2K | 0P<br>0K |
| 1P<br>1K | 0P<br>2K | 2P<br>2K | 1P<br>0K | 2P<br>0K | 0P<br>2K |
| 0P<br>0K | 1P<br>0K | 1P<br>2K | 1P<br>1K | 2P<br>2K | 1P<br>2K |
| 2P<br>1K | 2P<br>0K | 0P<br>1K | 0P<br>0K | 0P<br>1K | 2P<br>1K |
| C        |          |          | D        |          |          |

SYSTEM OF REPLICATION : 4 randomised blocks.  
 AREA OF EACH PLOT : 1/70th acre.  
 Soil : Black Fen land.  
 Variety : King Edward.  
 TREATMENTS : Superphosphate (P) at the rate of  
 0, 0.8 and 1.6 cwt.  $P_2O_5$  per acre, and Sulphate  
 of Potash (K) at the rate of 0, 1 and 2 cwt.  $K_2O$   
 per acre, in all combinations.  
 Manures applied : April 23rd.  
 Potatoes planted : April 25th.  
 Lifted : Sept. 25th.

**Actual weights in lb.**

| Blocks. | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| A ..    | 372 | 293 | 392 | 360 | 459 | 388 | 344 | 439 | 406 |
| B ..    | 334 | 444 | 437 | 393 | 385 | 434 | 366 | 438 | 439 |
| C ..    | 234 | 291 | 279 | 295 | 339 | 297 | 332 | 413 | 479 |
| D ..    | 262 | 385 | 338 | 335 | 382 | 367 | 297 | 365 | 421 |

**Summary of Results.**

| Average yield.      | Tons per acre. |                  |                   |       | Per cent.    |                  |                   |       |
|---------------------|----------------|------------------|-------------------|-------|--------------|------------------|-------------------|-------|
|                     | No<br>Super.   | 5 cwt.<br>Super. | 10 cwt.<br>Super. | Mean. | No<br>Super. | 5 cwt.<br>Super. | 10 cwt.<br>Super. | Mean. |
| No Potash ..        | 9.39           | 11.04            | 11.30             | 10.58 | 81.7         | 96.1             | 98.3              | 92.0  |
| 2 cwt. Sul./Pot. .. | 10.80          | 12.23            | 11.61             | 11.55 | 94.1         | 106.4            | 101.1             | 100.5 |
| 4 cwt. Sul./Pot. .. | 10.46          | 12.93            | 13.63             | 12.34 | 91.1         | 112.6            | 118.7             | 107.5 |
| Mean .. ..          | 10.22          | 12.07            | 12.18             | 11.49 | 89.0         | 105.0            | 106.0             | 100.0 |
| Standard Error ..   | 0.647          |                  |                   |       | 5.63         |                  |                   |       |

Significant response to the single dressing of superphosphate—no further response to the double dressing. Significant response, on the average, to the single and double dressings of sulphate of potash.

**Potatoes : Effect of Inorganic and Organic Fertilisers.**

Mr. Inskip, Stanford, Biggleswade, 1930.

**1.—HEAVY LAND.**

|      |   |   |   |   |
|------|---|---|---|---|
| I.   | 4 | 3 | 2 | 1 |
| II.  | 1 | 2 | 3 | 4 |
| III. | 3 | 4 | 1 | 2 |
| IV.  | 2 | 1 | 4 | 3 |

VARIETY : King Edward.

SYSTEM OF REPLICATION : Latin Square.

AREA OF EACH PLOT : 1/50th acre.

TREATMENTS :

1=Blood, Superphosphate.

2=Sulphate of Ammonia, Superphosphate.

3=Sulphate of Ammonia, Steamed Bone Flour.

4=Blood, Steamed Bone Flour.

Rates : 0.5 cwt. N and 0.6 cwt.  $P_2O_5$  per acre. All plots received Sulphate of Potashat the rate of 1.25 cwt.  $K_2O$  per acre.

Manures applied : April 2nd-3rd.

Potatoes set : April 2nd.

Lifted : Oct. 1st.

**Actual weights in lb.**

| Row.    | 1   | 2   | 3   | 4   |
|---------|-----|-----|-----|-----|
| I. ..   | 645 | 667 | 670 | 787 |
| II. ..  | 752 | 637 | 655 | 576 |
| III. .. | 642 | 627 | 686 | 575 |
| IV. ..  | 621 | 762 | 596 | 660 |

**Summary of Results.**

| Average Yield.   | Blood Super. | Sulph/Amm. Super. | Sulph/Amm. Steamed Bone Flour. | Blood Steamed Bone Flour. | Mean. | Standard Error. |
|------------------|--------------|-------------------|--------------------------------|---------------------------|-------|-----------------|
| Tons per acre .. | 14.84        | 15.03             | 14.55                          | 14.50                     | 14.73 | 0.311           |
| Per cent. ..     | 100.8        | 102.0             | 98.8                           | 98.4                      | 100.0 | 2.11            |

No significant differences in yield.

**2.—LIGHT LAND.**

|    |      |     |    |
|----|------|-----|----|
| —  | —    | —   | 4  |
| 1  | 2    | 3   | —  |
| —  | —    | 1   | 2  |
| 4  | 3    | —   | —  |
| —  | 1    | 4   | —  |
| 2  | —    | —   | 3  |
| 3  | 4    | —   | —  |
| —  | —    | 2   | 1  |
| IV | III. | II. | I. |

VARIETY : Great Scott.

SYSTEM OF REPLICATION : Latin Square.

AREA OF EACH WHOLE PLOT : 1/50th acre. Each plot divided into two sub-plots.

TREATMENTS :

1=Blood, Superphosphate.

2=Sulphate of Ammonia, Superphosphate.

3=Sulphate of Ammonia, Steamed Bone Flour.

4=Blood, Steamed Bone Flour.

Rates : 0.3 cwt. N and 0.4 cwt.  $P_2O_5$  per acre. Sulphate of Potash at the rate of 0.88 cwt.  $K_2O$  per acre applied to one out of each pair of sub-plots, indicated by the treatment symbol occurring on that half.

Manures applied : April 2nd-3rd.

Potatoes planted : April 2nd.

Lifted : Sept. 5th.

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## Actual weights in lb.

| Row.                     | Potash. |       |       |       | No Potash. |       |       |       |
|--------------------------|---------|-------|-------|-------|------------|-------|-------|-------|
|                          | 1       | 2     | 3     | 4     | 1          | 2     | 3     | 4     |
| I. ..                    | 118.0   | 118.0 | 104.5 | 125.0 | 105.5      | 116.0 | 96.5  | 96.0  |
| II. ..                   | 128.0   | 125.0 | 113.5 | 106.5 | 116.5      | 125.0 | 130.5 | 104.0 |
| III. ..                  | 99.5    | 124.5 | 126.5 | 123.0 | 128.5      | 124.5 | 97.5  | 108.0 |
| IV. ..                   | 125.0   | 140.5 | 144.0 | 129.0 | 125.0      | 115.5 | 138.0 | 115.0 |
| Average in tons per acre | 5.25    | 5.67  | 5.45  | 5.40  | 5.31       | 5.37  | 5.16  | 4.72  |

## Summary of Results.

| Average Yield.   | Blood, Super. | Sulph/Amm. Super. | Sulph/Amm. Bone Flour. | Blood, Bone Flour. | Mean. | Standard Error. |
|------------------|---------------|-------------------|------------------------|--------------------|-------|-----------------|
| Tons per acre .. | 5.28          | 5.52              | 5.31                   | 5.06               | 5.29  | 0.127           |
| Per cent. ..     | 99.8          | 104.3             | 100.3                  | 95.6               | 100.0 | 2.40            |

| Average yield.   | Without Potash. | With Potash. | Mean. | Standard Error. |
|------------------|-----------------|--------------|-------|-----------------|
| Tons per acre .. | 5.14            | 5.44         | 5.29  | 0.124           |
| Per cent. .. ..  | 97.1            | 102.9        | 100.0 | 2.35            |

The differences between the nitrogenous and phosphatic treatments are not significant. There is a small, non-significant advantage due to the potassic dressing.

## 3.—EXPERIMENT ON FISH MEAL.

|    |     |      |     |
|----|-----|------|-----|
| A  | A   | B    | B   |
| B  | B   | A    | A   |
| I. | II. | III. | IV. |

Soil: Heavy loam.  
 VARIETY: King Edward.  
 SYSTEM OF REPLICATION: 4 randomised blocks.  
 AREA OF EACH PLOT: 1/50th acre.  
 TREATMENT:  
 A=Sulphate of Ammonia and Superphosphate.  
 B=Sulphate of Ammonia and Fish Meal.  
 Rates: 0.5 cwt. N and 0.6 cwt.  $P_2O_5$  per acre. All plots received Sulphate of Potash at the rate of 1.25 cwt.  $K_2O$  per acre.  
 Manures applied: April 3rd.  
 Potatoes planted: April 1st. Lifted: Oct. 1st.

## Actual weights in lb.

| Treatment. | I.  | II. | III. | IV. |
|------------|-----|-----|------|-----|
| A .. ..    | 756 | 658 | 757  | 712 |
| B .. ..    | 790 | 701 | 714  | 682 |

## Summary of Results.

| Average yield.      | S./Ammonia Super. | S./Ammonia Fish Meal. | Mean. | Standard Error. |
|---------------------|-------------------|-----------------------|-------|-----------------|
| Tons per acre .. .. | 16.09             | 16.11                 | 16.10 | 0.346           |
| Per cent. .. ..     | 99.9              | 100.1                 | 100.0 | 2.15            |

No difference in yield.

## Sugar Beet: Effect of Nitrogenous Fertilisers, and of Muriate of Potash and Agricultural Salt.

Farm of Messrs. C. S. and G. M. Wilson, Colchester.

| A |   |   | B |   |   |
|---|---|---|---|---|---|
| 7 | 9 | 8 | 2 | 7 | 5 |
| 4 | 1 | 5 | 4 | 9 | 6 |
| 6 | 2 | 3 | 1 | 3 | 8 |
| 5 | 2 | 8 | 4 | 9 | 7 |
| 4 | 6 | 9 | 8 | 5 | 1 |
| 7 | 1 | 3 | 3 | 2 | 6 |
| C |   |   | D |   |   |

SYSTEM OF REPLICATION: 4 randomised blocks of 9 plots each.  
AREA OF EACH PLOT: 1/60th acre.

TREATMENTS: Sulphate of Ammonia and Nitrate of Soda at the rate of 0.4 cwt. N per acre, Muriate of Potash at the rate of 0.8 cwt. K<sub>2</sub>O per acre, and Salt equivalent in Chloride to Muriate of Potash, as shown in the Key to Treatments.

All plots received dung, and Superphosphate at the rate of 0.4 cwt. P<sub>2</sub>O<sub>5</sub> per acre.

Soil: Light sandy gravel.

Manures applied: April 25th.

Seed sown: April 28th. Lifted: Nov. 6th-7th.

Variety: Kuhn P.

### Key to Treatments.

| Treatment.  | 1 | 2 | 3 | 4   | 5   | 6   | 7   | 8   | 9   |
|-------------|---|---|---|-----|-----|-----|-----|-----|-----|
| Nitrogen .. |   |   |   | S/A | S/A | S/A | N/S | N/S | N/S |
| M/Potash .. |   | x | x |     | x   | x   |     | x   | x   |
| Salt ..     |   |   | x |     |     | x   |     |     | x   |

### Actual weights in lb.

| Treatments.<br>N      K |         | Roots (dirty). |     |     |     | Tops. |     |     |     |
|-------------------------|---------|----------------|-----|-----|-----|-------|-----|-----|-----|
|                         |         | A              | B   | C   | D   | A     | B   | C   | D   |
| O                       | O       | 239            | 263 | 412 | 501 | 177   | 145 | 323 | 285 |
| O                       | M/P     | 349            | 352 | 456 | 436 | 301   | 256 | 360 | 317 |
| O                       | M/P & S | 286            | 369 | 352 | 327 | 234   | 257 | 286 | 256 |
| S/A                     | O       | 213            | 359 | 463 | 380 | 195   | 256 | 305 | 267 |
| S/A                     | M/P     | 221            | 267 | 466 | 468 | 202   | 291 | 364 | 368 |
| S/A                     | M/P & S | 389            | 304 | 478 | 529 | 331   | 351 | 430 | 453 |
| N/S                     | O       | 256            | 383 | 482 | 507 | 236   | 366 | 347 | 411 |
| N/S                     | M/P     | 357            | 399 | 495 | 523 | 352   | 456 | 417 | 384 |
| N/S                     | M/P & S | 329            | 370 | 514 | 502 | 340   | 363 | 427 | 379 |

## Summary of Results.

| Average yield in tons per acre. | Roots (washed). |           |                |       | Tops.     |           |                |      | Average Sugar Percentage. |           |                |       |
|---------------------------------|-----------------|-----------|----------------|-------|-----------|-----------|----------------|------|---------------------------|-----------|----------------|-------|
|                                 | No Potash       | Mur./Pot. | M/Pot. & Salt. | Mean  | No Potash | Mur./Pot. | M/Pot. & Salt. | Mean | No Potash                 | Mur./Pot. | M/Pot. & Salt. | Mean. |
| No Nitrogen ..                  | 8.59            | 9.68      | 8.10           | 8.79  | 6.23      | 8.26      | 6.92           | 7.14 | 18.94                     | 18.79     | 19.36          | 19.03 |
| Sulph./Amm. ..                  | 8.59            | 8.64      | 10.33          | 9.19  | 6.85      | 8.20      | 10.48          | 8.51 | 18.85                     | 18.14     | 18.66          | 18.55 |
| Nitrate of Soda ..              | 9.89            | 10.77     | 10.42          | 10.36 | 9.11      | 10.77     | 10.10          | 9.99 | 18.55                     | 18.74     | 18.72          | 18.67 |
| Mean .. ..                      | 9.02            | 9.70      | 9.62           | 9.45  | 7.40      | 9.08      | 9.17           | 8.55 | 18.78                     | 18.56     | 18.91          | 18.75 |
| Standard Error                  | 0.607           |           |                |       | 0.523     |           |                |      | 0.241                     |           |                |       |

| Average yield per cent. | Roots (washed). |                   |                   |       | Tops.     |                   |                   |       |
|-------------------------|-----------------|-------------------|-------------------|-------|-----------|-------------------|-------------------|-------|
|                         | No Potash       | Muriate of Potash | M/Potash and Salt | Mean  | No Potash | Muriate of Potash | M/Potash and Salt | Mean  |
| No Nitrogen ..          | 91.0            | 102.4             | 85.8              | 93.1  | 72.9      | 96.7              | 80.9              | 83.5  |
| Sulph./Amm. ..          | 91.0            | 91.5              | 109.3             | 97.3  | 80.1      | 96.0              | 122.6             | 99.6  |
| Nitrate of Soda ..      | 104.7           | 114.1             | 110.3             | 109.7 | 106.5     | 126.1             | 118.2             | 116.9 |
| Mean .. ..              | 95.6            | 102.7             | 101.8             | 100.0 | 86.5      | 106.3             | 107.2             | 100.0 |
| Standard Error ..       | 6.43            |                   |                   |       | 6.12      |                   |                   |       |

Significant response to sulphate of ammonia when applied to those plots having muriate of potash and salt. Nitrate of soda plots significantly superior to sulphate of ammonia plots except in the presence of muriate of potash and salt. The response to muriate of potash is only significant with tops; further response is produced by adding salt only on those plots having sulphate of ammonia. The application of nitrogenous dressing has lowered the sugar percentage significantly.

**Experiments** at other centres, carried out by the local workers on the lines of those described on the preceding pages.

**Potatoes.** Mr. J. E. Arden, Owmbly Cliff, Lincolnshire, 1930.

Latin Square : Plots 1/80th acre. Soil : Cliff (limestone).  
 Basal Manuring : 4 cwt. Sulphate of Ammonia and 3 cwt. Muriate of Potash per acre.  
 Variety : King Edward. Potatoes planted : April 17th. Lifted : Oct. 10th.

| Average Yield.   | No Super. | 2 cwt. Super. | 4 cwt. Super. | 8 cwt. Super. | Mean. | Standard Error. |
|------------------|-----------|---------------|---------------|---------------|-------|-----------------|
| Tons per acre .. | 11.37     | 12.19         | 11.85         | 12.34         | 11.94 | 0.169           |
| Per cent. ..     | 95.2      | 102.1         | 99.3          | 103.4         | 100.0 | 1.41            |

Significant response to the first dressing of superphosphate. No further response to the higher dressings.

**Potatoes.** Midland Agricultural College, Loughborough, 1930.

Randomised blocks : Plots 1/48.4 acre. Soil : Light gravel.  
 Basal Manuring : 3 cwt. Sulphate of Ammonia and 3 cwt. Sulphate of Potash per acre.  
 Variety : King Edward. Potatoes planted : April 11th. Lifted : Sept. 19th. Previous Crop : Spring Oats.

| Average Yield.   | No Super. | 2 cwt. Super. | 4 cwt. Super. | 8 cwt. Super. | Mean. | Standard Error. |
|------------------|-----------|---------------|---------------|---------------|-------|-----------------|
| Tons per acre .. | 10.03     | 10.98         | 9.05          | 9.70          | 9.94  | 0.449           |
| Per cent. ..     | 100.9     | 110.5         | 91.1          | 97.6          | 100.0 | 4.52            |

The yield has been significantly depressed by the heavier dressings (4 and 8 cwt.) of superphosphate.

**Potatoes.** County School, Welshpool, Montgomeryshire, 1930.

Randomised blocks : Plots 1/160th acre. Soil : School Garden.  
 Basal Manuring : 10 tons of F.Y.M. per acre, Sulphate of Ammonia at the rate of 0.8 cwt. N per acre, and Sulphate of Potash at the rate of 2 cwt. K<sub>2</sub>O per acre.  
 Variety : Great Scott. Potatoes planted : May 7th. Lifted : Sept. 29th-Oct. 3rd.  
 Previous Crop : Sugar Beet.

| Average Yield.   | No Super. | 2 cwt. Super. | 4 cwt. Super. | 8 cwt. Super. | Mean. | Standard Error. |
|------------------|-----------|---------------|---------------|---------------|-------|-----------------|
| Tons per acre .. | 9.18      | 11.64         | 13.29         | 12.36         | 11.62 | 0.339           |
| Per cent. ..     | 79.0      | 100.2         | 114.4         | 106.4         | 100.0 | 2.92            |

Significant responses to dressings of 2 and 4 cwt. of superphosphate. Slight set-back with the highest dressing, which, however, is not significant.

**Potatoes.** Mr. J. Clarke, Eskham House, Nateby, Lancashire, 1930.

Latin Square : Plots 1/62 acre. Soil : Moss soil on deep peat.  
 Basal Manuring : Dung at the rate of 12 tons per acre, 2 cwt. per acre Sulphate of Potash and 2 cwt. Sulphate of Ammonia per acre.  
 Variety : King Edward. Potatoes planted : May 1st. Lifted : Sept. 22nd.

| Average Yield.   | No Super. | 2 cwt. Super. | 4 cwt. Super. | 8 cwt. Super. | Mean. | Standard Error. |
|------------------|-----------|---------------|---------------|---------------|-------|-----------------|
| Tons per acre .. | 9.24      | 9.54          | 9.50          | 9.44          | 9.43  | 0.269           |
| Per cent. ..     | 98.0      | 101.2         | 100.7         | 100.1         | 100.0 | 2.85            |

No response to superphosphate.

**Potatoes. Mr. George, Great Nash, Llangwm, 1930.**

Latin Square: Plots 1/185th acre. Soil: Sandy-hungry.  
 Basal Manuring: 2 cwt. per acre Sulphate of Ammonia and 2 cwt. per acre Sulphate of Potash.  
 Variety: Kerr's Pink. Potatoes planted: May 2nd. Lifted: Jan. 5th, 1931.

| Average Yield.   | No Super. | 2 cwt. Super. | 4 cwt. Super. | 8 cwt. Super. | Mean. | Standard Error. |
|------------------|-----------|---------------|---------------|---------------|-------|-----------------|
| Tons per acre .. | 7.94      | 9.21          | 9.68          | 9.96          | 9.20  | 0.216           |
| Per cent. ..     | 86.4      | 100.1         | 105.2         | 108.3         | 100.0 | 2.34            |

Significant response to superphosphate. The increment in yield falls off at the higher levels.

**Potatoes. Grammar School, Burford, Oxon, 1930.**

Latin Square: Plots 1/100th acre. Soil: Light loam on limestone.  
 TREATMENTS: Sulphate of Ammonia and Blood at the rate of 0.6 cwt. N per acre. Superphosphate and Bone Flour at the rate of 0.8 cwt.  $P_2O_5$  per acre.  
 Basal Manuring: Sulphate of Potash at the rate of 1.4 cwt.  $K_2O$  per acre.  
 Variety: Kerr's Pink. Potatoes planted: April 10th. Lifted: Oct. 7th.

| Average Yield.   | Sulph/Amm. Bone Flour. | Dried Blood, Bone Flour. | Dried Blood, Super. | Sulph/Amm. Super. | Mean. | Standard Error. |
|------------------|------------------------|--------------------------|---------------------|-------------------|-------|-----------------|
| Tons per acre .. | 9.03                   | 8.82                     | 9.91                | 9.05              | 9.20  | 0.554           |
| Per cent. ..     | 98.1                   | 95.8                     | 107.7               | 98.4              | 100.0 | 6.02            |

No significant differences between treatments.

**Potatoes. Sailors' Orphan Homes School, Hull, 1930.**

Latin Square: Plots 1/435 acre. Soil: Heavy Clay.  
 TREATMENTS: Sulphate of Ammonia at the rate of 0.4 cwt. N per acre, and Superphosphate at the rate of 0.5 cwt.  $P_2O_5$  per acre.  
 Basal Manuring: Sulphate of Potash at the rate of 1 cwt. per acre  $K_2O$ .  
 Variety: Kerr's Pink. Potatoes planted: April 29th-30th. Lifted: Oct. 1st.

| Average Yield.   | Sulph/Amm. Super. | Sulph/Amm. Bone Flour. | Super Blood. | Bone Flour. Blood. | Mean. | Standard Error. |
|------------------|-------------------|------------------------|--------------|--------------------|-------|-----------------|
| Tons per acre .. | 11.69             | 9.86                   | 10.88        | 9.01               | 10.36 | 0.425           |
| Per cent. ..     | 112.9             | 95.2                   | 105.0        | 87.0               | 100.0 | 4.10            |

Yield of plots receiving superphosphate significantly better than that of those receiving bone flour, irrespective of the source of nitrogen. The mean of all plots having sulphate of ammonia is significantly higher than that of those having nitrogen in the form of blood.

**Sugar Beet. County School, Welshpool, Montgomeryshire, 1930.**

Randomised blocks: Plots 1/160th acre. Soil: School Garden.  
 TREATMENTS: Sulphate of Ammonia, Cyanamide and Nitrate of Soda at the rate of 0.4 cwt. N per acre.  
 Basal Manuring: F.Y.M. at the rate of 10 tons per acre, Superphosphate at the rate of 0.8 cwt.  $P_2O_5$  per acre and Muriate of Potash at the rate of 1 cwt.  $K_2O$  per acre.  
 Variety: Garton's Warrington. Beet sown: May 20th. Lifted: Oct. 28th-30th. Previous Crop: Mangolds and Swedes.

| Average Yield.                | No Nitrogen. | Nitrate of Soda. | Sulphate of Ammonia. | Cyanamide. | Mean. | Standard Error. |
|-------------------------------|--------------|------------------|----------------------|------------|-------|-----------------|
| Roots (washed), tons per acre | 11.59        | 12.57            | 13.32                | 11.96      | 12.36 | 0.135           |
| Roots, per cent.              | 93.7         | 101.8            | 107.7                | 96.8       | 100.0 | 1.09            |
| Tops, tons per acre ..        | 17.11        | 20.50            | 21.86                | 18.82      | 19.57 | 0.270           |
| Tops, per cent.               | 87.4         | 104.7            | 111.7                | 96.2       | 100.0 | 1.38            |
| Sugar percentage in roots ..  | 16.49        | 16.75            | 16.47                | 16.83      | 16.63 | 0.235           |

Significant responses to all forms of nitrogenous fertiliser. Sulphate of ammonia has proved significantly superior to nitrate of soda, while nitrate of soda in turn has produced a significantly higher yield than cyanamide. No significant differences in sugar percentage.

**Sugar Beet. South Eastern Agricultural College, Wye, Kent, 1930.**

Latin Square: Plots 1/50th acre. Soil: Light chalk loam.  
 TREATMENTS: Sulphate of Ammonia with seed at the rate of 3 cwt. per acre, Nitrate of Soda, top dressed, at the rate of 444 lb. per acre and Calcium Cyanamide before drilling at the rate of 3 cwt. per acre.  
 Basal Manuring: Superphosphate at the rate of 4 cwt. per acre, and Muriate of Potash at the rate of 2 cwt. per acre.  
 Variety: Klein Wanzleben. Beet sown: May 8th. Lifted: Oct. 28th-30th.  
 Previous Crop: Sugar Beet.

| Average Yield.                 | No Nitrogen. | Sulphate of Ammonia. | Nitrate of Soda. | Cyanamide. | Mean. | Standard Error. |
|--------------------------------|--------------|----------------------|------------------|------------|-------|-----------------|
| Roots (washed) tons per acre.. | 10.61        | 12.44                | 12.72            | 12.65      | 12.11 | 0.187           |
| Roots, per cent.               | 87.6         | 102.8                | 105.1            | 104.5      | 100.0 | 1.55            |
| Tops, tons per acre ..         | 11.90        | 15.36                | 18.19            | 16.15      | 15.40 | 0.401           |
| Tops, per cent.                | 77.3         | 99.7                 | 118.1            | 104.9      | 100.0 | 2.60            |
| Sugar percentage in roots ..   | 17.83        | 17.53                | 17.59            | 17.85      | 17.70 | 0.566           |

Significant responses to all forms of nitrogenous fertiliser. Nitrate of soda plots significantly better than the sulphate of ammonia and cyanamide plots in tops, but not in roots. No significant differences in sugar percentage.

**Sugar Beet. South Eastern Agricultural College, Wye, Kent, 1930.**

Latin Square: Plots 1/50th acre. Soil: Light chalk loam.  
 TREATMENTS: Muriate of Potash at the rate of 2 cwt. per acre and Salt (176 lb. per acre) providing equivalent Chlorine to Muriate of Potash.  
 Basal Manuring: Superphosphate at the rate of 4 cwt. per acre and Sulphate of Ammonia at the rate of 3 cwt. per acre.  
 Variety: Klein Wanzleben. Beet sown: May 8th. Lifted: Oct. 22nd-25th.  
 Previous Crop: Sugar Beet.

| Average Yield.                 | Control. | Salt. | Muriate of Potash. | Muriate of Potash & Salt | Mean. | Standard Error. |
|--------------------------------|----------|-------|--------------------|--------------------------|-------|-----------------|
| Roots (washed) tons per acre.. | 12.58    | 13.02 | 13.29              | 13.27                    | 13.04 | 0.137           |
| Roots, per cent.               | 96.5     | 99.8  | 102.0              | 101.7                    | 100.0 | 1.05            |
| Sugar percentage in roots ..   | 16.42    | 16.66 | 16.80              | 16.60                    | 16.62 | 0.128           |

Significant response to the potassic and salt dressings. No further response to the double dressing.

**Sugar Beet. County Farm Institute, Moulton, Northampton, 1930.**

Latin Square: Plots 1/50th acre. Soil: Sandy loam.  
 TREATMENTS: Muriate of Potash at the rate of 2 cwt. per acre and Salt (196 lb. per acre) providing equivalent Chlorine to Muriate.  
 Basal Manuring: Superphosphate at the rate of 2 cwt. per acre, Steamed Bone Flour at the rate of 1 cwt. per acre, 2 cwt. Sulphate of Ammonia per acre.  
 Variety: Klein Wanzleben E. Beet sown: May 2nd. Lifted: Oct. 22nd.

| Average Yield.                 | Control. | Muriate of Potash. | Salt. | Muriate of Potash & Salt | Mean. | Standard Error. |
|--------------------------------|----------|--------------------|-------|--------------------------|-------|-----------------|
| Roots (washed) tons per acre.. | 10.08    | 11.76              | 11.85 | 11.54                    | 11.31 | 0.483           |
| Roots, per cent.               | 89.2     | 104.0              | 104.8 | 102.0                    | 100.0 | 4.27            |
| Tops, tons per acre ..         | 13.70    | 13.48              | 14.43 | 14.48                    | 14.02 | 0.854           |
| Tops, per cent...              | 97.7     | 96.1               | 102.9 | 103.2                    | 100.0 | 6.09            |
| Sugar percentage in roots ..   | 17.02    | 17.52              | 17.81 | 18.26                    | 17.65 | 0.175           |

Significant response in roots to muriate of potash and salt applied separately, but no further response when they were applied together. With tops the small response to salt is insignificant. Muriate of potash and salt have significantly increased the sugar percentage in roots, while on the plots receiving both muriate of potash and salt the sugar percentage is significantly greater than on the plots receiving the dressings separately.

## Sugar Beet. The University of Leeds, Askham Bryan, Yorks, 1930.

Latin Square: Plots 1/20th acre. Soil: Light drift on Sandstone.  
TREATMENTS: Nitrate of Soda with seed, Sulphate of Ammonia with seed and Nitrate of Soda as top dressing. Applications equivalent to 2 cwt. Sulphate of Ammonia per acre.  
Variety: Johnson's Improved. Beet sown: May 3rd. Lifted: Oct. 29th-30th.  
Previous Crop: Wheat.

| Average Yield.                 | No Nitrogen. | N./Soda top dressing. | N./Soda with seed. | S/Ammonia with seed. | Mean. | Standard Error. |
|--------------------------------|--------------|-----------------------|--------------------|----------------------|-------|-----------------|
| Roots (washed) tons per acre.. | 8.23         | 9.17                  | 9.76               | 10.08                | 9.31  | 0.233           |
| Roots, per cent.               | 88.4         | 98.5                  | 104.8              | 108.3                | 100.0 | 2.50            |
| Tops, tons per acre ..         | 9.48         | 10.94                 | 11.59              | 11.62                | 10.90 | 0.221           |
| Tops, per cent...              | 86.9         | 100.3                 | 106.3              | 106.5                | 100.0 | 2.03            |
| Sugar percentage in roots ..   | 18.01        | 18.26                 | 18.02              | 17.89                | 18.05 | 0.215           |

Significant response to all forms of nitrogenous fertiliser with both roots and tops. Yield of plots having the dressing with the seed is significantly greater than that of plots having the top dressing. No difference between sulphate of ammonia and nitrate of soda when applied with seed. No significant differences in sugar percentage.

## Barley. South Eastern Agricultural College, Wye, Kent, 1930.

Latin Square: Plots 1/50th acre. Soil: Light chalk loam.  
TREATMENTS: Salt at the rate of 88 lb. per acre and Muriate of Potash at the rate of 1 cwt. per acre.  
Basal Manuring: Superphosphate at the rate of 4 cwt. per acre and Sulphate of Ammonia at the rate of 1 cwt. per acre.  
Variety: Plumage Archer. Barley sown: Mar. 4th. Harvested: Aug. 12th.  
Previous Crop: Barley.

| Average Yield.                 | No Salt or Potash. | Muriate of Potash. | Salt. | Muriate of Potash & Salt | Mean. | Standard Error. |
|--------------------------------|--------------------|--------------------|-------|--------------------------|-------|-----------------|
| Grain, cwt. per acre ..        | 19.4               | 20.0               | 20.2  | 20.3                     | 20.0  | 0.77            |
| Grain, per cent.               | 97.3               | 100.1              | 101.2 | 101.5                    | 100.0 | 3.88            |
| Straw, cwt. per acre ..        | 17.4               | 17.4               | 16.6  | 16.7                     | 17.0  | 0.71            |
| Straw, per cent.               | 102.1              | 102.1              | 97.5  | 98.2                     | 100.0 | 4.16            |
| Nitrogen percentage in grain.. | 1.33               | 1.31               | 1.30  | 1.30                     | 1.31  | 0.009           |

No response to the potassic or salt fertilisers. Application of salt has depressed the nitrogen percentage significantly, while muriate of potash has been without effect.