

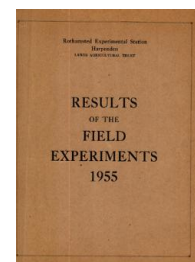
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# Yields of the Field Experiments 1955

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## 55/R/BA/2 Four-course Rotation

### Rothamsted Research

Rothamsted Research (1956) *55/R/BA/2 Four-course Rotation* ; Yields Of The Field Experiments 1955, pp 24 - 27 - DOI: <https://doi.org/10.23637/ERADOC-1-175>

55/Ba/2.1

#### FOUR COURSE ROTATION EXPERIMENT

1st year of revised scheme

The experiment in its original form ended at the harvest of 1954. A summary of the results and details of the original scheme appear in the Station annual report for 1954 (p.153).

The cropping rotation has been modified by introducing beans (autumn sown when possible) instead of ryegrass ley, the present rotation being: potatoes, barley, beans, wheat.

The applications of dung, straw, straw compost and rock phosphate have been discontinued. The plots of the original dung, straw and superphosphate series now receive an annual dressing of 0.24 cwt  $P_2O_5$  per acre applied as superphosphate, while the old compost plots receive 0.12 cwt  $P_2O_5$  annually as superphosphate. The rock phosphate plots receive no phosphate. All plots receive a basal dressing of 0.6 cwt  $K_2O$  annually as muriate of potash (but see below for the beans of 1955 and the wheat of 1956).

Each plot of wheat, barley and potatoes is split into 2 for the application of nitrogen:-

|                   |   |
|-------------------|---|
| wheat and barley: | none; 0.4 cwt N per acre<br>applied as sulphate of ammonia. |
| potatoes:         | 0.2; 0.6 cwt N per acre<br>applied as sulphate of ammonia   |

The arrangement of the levels of nitrogen is randomized afresh each season. The beans do not receive nitrogen.

The phosphate and potash fertilizers are applied in autumn for beans and wheat, half-plots of wheat receiving a single top dressing of nitrogen in spring. All fertilizers for barley are applied to the seedbed. All fertilizers for potatoes are broadcast on the flat before planting, which is by machine.

In 1955 the plots of beans were split into 3 for the application of potash:-

none; 0.8; 1.6 cwt  $K_2O$  per acre applied as muriate of potash.

The wheat following these beans will receive equalizing amounts of potash:- 1.6 cwt  $K_2O$  following none; 0.8 following 0.8 and none following 1.6. It is not intended to repeat this test.

55/Ba/2.2

Area of each sub plot: Potatoes, wheat: 0.0129 acre. Barley: 0.0120  
acre. Beans: 0.0081 acre.

Area harvested: Potatoes: 0.0106 acre. Wheat: 0.0057 acre.  
Barley: 0.0052 acre. Beans: 0.0038 acre.

Cultivations, etc.:

Potatoes.

Ploughed: Sept 22, 1954. Fertilizers applied broadcast on flat:  
May 3, 1955. Machine planted: May 4. Earthed up: July 6.  
Sprayed with sulphuric acid, 20% B.O.V.: Oct 4. Lifted: Oct 10.  
Variety: Majestic.

Barley.

Ploughed: Oct 12, 1954. Seed drilled at 3 bushels per acre:  
Mar 22, 1955. Fertilizers applied: Mar 31. Sprayed with M.C.P.A.,  
medium volume,  $2\frac{1}{2}$  pints per acre: June 8. Combine harvested:  
Aug 19. Variety: Plumage Archer.

Beans.

Ploughed: Sept 8, 1954. Potash dressings applied: Oct 26.  
Phosphate dressings applied: Mar 18, 1955. Seed drilled at 200 lb.  
per acre: Mar 21. Harvested: Aug 22. Variety: Gartons Spring Tick.

Wheat.

Ploughed: July 23 and again Aug 26, 1954. Seed sown at  $2\frac{3}{4}$  bushels  
per acre: Oct 22. Basal potash fertilizer applied: Oct 26.  
Nitrogen and phosphate fertilizer treatments applied: May 11, 1955.  
Sprayed with M.C.P.A., medium volume,  $2\frac{1}{2}$  pints per acre: May 31.  
Combine harvested: Aug 24. Variety: Yeoman.

55/Ba/2.3

Summary of Results

| Previous Treatment   | Year applied | P2O5: cwt per acre applied 1955 | Potatoes                    |             |       | Percentage Ware |      |       | Barley (at 85% Dry matter): cwt per acre |      |       |       |
|----------------------|--------------|---------------------------------|-----------------------------|-------------|-------|-----------------|------|-------|--|------|-------|-------|
|                      |              |                                 | Total tubers: tons per acre | N: per acre | Diff. | N: per acre     | Mean | Diff. | N: per acre                              | Mean | Diff. |       |
| Manure               | 1954         |                                 | 4.28                        | 5.03        | 4.66  | +0.75           | 82.1 | 82.1  | 27.2                                     | 34.0 | 30.6  | +6.8  |
|                      | 1953         |                                 | 4.28                        | 4.91        | 4.60  | +0.63           | 81.6 | 80.8  | 19.4                                     | 33.8 | 26.6  | +14.4 |
|                      | 1952         | 0.24                            | 5.08                        | 6.71        | 5.90  | +1.63           | 81.6 | 85.6  | 18.5                                     | 28.9 | 23.7  | +10.4 |
|                      | 1951         |                                 | 3.69                        | 4.70        | 4.20  | +1.01           | 81.8 | 82.0  | 25.7                                     | 26.9 | 26.3  | +1.2  |
|                      | 1950         |                                 | 5.24                        | 5.33        | 5.28  | +0.09           | 82.0 | 82.9  | 18.4                                     | 25.0 | 21.7  | +6.6  |
| Adco (straw compost) | 1954         |                                 | 4.41                        | 4.83        | 4.62  | +0.42           | 84.1 | 83.8  | 28.9                                     | 25.9 | 27.4  | -3.0  |
|                      | 1953         |                                 | 4.66                        | 4.70        | 4.68  | +0.04           | 87.1 | 84.8  | 17.9                                     | 21.1 | 19.5  | +3.2  |
|                      | 1952         | 0.12                            | 3.52                        | 4.74        | 4.13  | +1.22           | 84.3 | 85.3  | 11.4                                     | 20.6 | 16.0  | +9.2  |
|                      | 1951         |                                 | 4.66                        | 4.62        | 4.64  | -0.04           | 81.9 | 82.6  | 10.0                                     | 16.8 | 13.4  | +6.8  |
|                      | 1950         |                                 | 3.99                        | 4.03        | 4.01  | +0.04           | 84.6 | 86.0  | 22.6                                     | 23.1 | 22.8  | +0.5  |
| Straw                | 1954         |                                 | 4.78                        | 5.20        | 4.99  | +0.42           | 82.0 | 83.9  | 22.4                                     | 34.9 | 28.6  | +12.5 |
|                      | 1953         |                                 | 4.78                        | 5.33        | 5.06  | +0.55           | 83.0 | 84.6  | 23.5                                     | 23.3 | 23.4  | -0.2  |
|                      | 1952         | 0.24                            | 5.12                        | 5.75        | 5.44  | +0.63           | 85.9 | 85.4  | 23.0                                     | 26.7 | 24.8  | +3.7  |
|                      | 1951         |                                 | 3.73                        | 5.12        | 4.42  | +1.39           | 78.9 | 79.6  | 18.5                                     | 33.7 | 26.1  | +15.2 |
|                      | 1950         |                                 | 4.95                        | 5.24        | 5.10  | +0.29           | 87.7 | 84.4  | 23.1                                     | 35.4 | 29.2  | +12.3 |
| Super-phosphate      | 1954         |                                 | 4.28                        | 4.91        | 4.60  | +0.63           | 83.3 | 84.6  | 26.5                                     | 24.7 | 25.6  | -1.8  |
|                      | 1953         |                                 | 4.99                        | 6.04        | 5.52  | +1.05           | 80.9 | 87.7  | 17.3                                     | 27.6 | 22.4  | +10.3 |
|                      | 1952         | 0.24                            | 4.70                        | 4.78        | 4.74  | +0.08           | 81.0 | 81.6  | 23.6                                     | 35.2 | 29.4  | +11.6 |
|                      | 1951         |                                 | 3.78                        | 4.41        | 4.10  | +0.63           | 79.5 | 81.7  | 15.0                                     | 23.6 | 19.3  | +8.6  |
|                      | 1950         |                                 | 4.49                        | 5.20        | 4.84  | +0.71           | 85.0 | 84.4  | 13.1                                     | 23.0 | 18.0  | +9.9  |
| Rock phosphate       | 1954         |                                 | 4.03                        | 4.74        | 4.38  | +0.71           | 80.5 | 87.6  | 11.6                                     | 16.0 | 13.8  | +4.4  |
|                      | 1953         |                                 | 3.52                        | 4.57        | 4.04  | +1.05           | 85.4 | 86.7  | 18.9                                     | 21.3 | 20.1  | +2.4  |
|                      | 1952         | None                            | 3.57                        | 4.15        | 3.86  | +0.58           | 76.5 | 84.8  | 19.9                                     | 23.5 | 21.7  | +3.6  |
|                      | 1951         |                                 | 3.52                        | 4.45        | 3.98  | +0.93           | 83.4 | 85.3  | 10.9                                     | 13.8 | 12.4  | +2.9  |
|                      | 1950         |                                 | 4.49                        | 4.45        | 4.47  | -0.04           | 86.7 | 86.0  | 13.6                                     | 19.6 | 16.6  | +6.0  |

Mean dry matter % as harvested:

55/Ba/2.4

| Previous Treatment              | Year applied | P <sub>2</sub> O <sub>5</sub> : cwt per acre applied 1955 | Beans (at 85% dry matter):              |                                |      | Wheat       |                     |      | Diff. |
|---------------------------------|--------------|---|---|--------------------------------|------|-------------|---------------------|------|-------|
|                                 |              |   | Grain (at 85% dry matter): cwt per acre | K <sub>2</sub> O: cwt per acre | Mean | N: per acre | Grain: cwt per acre | Mean |       |
| Manure                          |              |   | 0.8                                     | 1.6                            | Mean | None        | 0.4                 | Mean |       |
|                                 | 1954         |   | 11.7                                    | 17.1                           | 13.4 | 13.8        | 24.7                | 19.2 | +10.9 |
|                                 | 1953         |   | 15.2                                    | 13.8                           | 14.8 | 9.4         | 17.2                | 13.3 | +7.8  |
| Dung                            | 1952         | 0.24  | 16.2                                    | 20.2                           | 16.9 | 12.8        | 23.2                | 18.0 | +10.4 |
|                                 | 1951         |   | 12.1                                    | 12.1                           | 13.0 | 9.7         | 20.4                | 15.0 | +10.7 |
|                                 | 1950         |   | 19.8                                    | 14.5                           | 17.4 | 10.7        | 18.5                | 14.6 | +7.8  |
| Adco (straw compost)            | 1954         |   | 14.8                                    | 15.0                           | 16.0 | 12.2        | 21.6                | 16.9 | +9.4  |
|                                 | 1953         |   | 13.1                                    | 12.6                           | 14.1 | 11.7        | 19.1                | 15.4 | +7.4  |
|                                 | 1952         | 0.12  | 15.2                                    | 11.2                           | 12.6 | 11.3        | 19.6                | 15.4 | +8.3  |
|                                 | 1951         |   | 16.7                                    | 14.3                           | 16.4 | 9.1         | 16.0                | 12.6 | +6.9  |
|                                 | 1950         |   | 15.7                                    | 9.3                            | 12.5 | 11.7        | 20.1                | 15.9 | +8.4  |
| Straw                           | 1954         |   | 18.8                                    | 15.0                           | 16.7 | 13.3        | 19.6                | 16.4 | +6.3  |
|                                 | 1953         |   | 13.1                                    | 15.7                           | 15.1 | 11.0        | 20.1                | 15.6 | +9.1  |
|                                 | 1952         | 0.24  | 16.0                                    | 16.7                           | 16.6 | 14.1        | 16.0                | 15.0 | +1.9  |
|                                 | 1951         |   | 12.1                                    | 10.5                           | 12.1 | 11.0        | 20.4                | 15.7 | +9.4  |
|                                 | 1950         |   | 13.6                                    | 15.2                           | 13.8 | 11.3        | 23.5                | 17.4 | +12.2 |
| Super-phosphate                 | 1954         |   | 11.4                                    | 14.8                           | 13.7 | 8.6         | 16.4                | 12.5 | +7.8  |
|                                 | 1953         |   | 6.9                                     | 13.3                           | 11.7 | 9.4         | 18.5                | 14.0 | +9.1  |
|                                 | 1952         | 0.24  | 17.4                                    | 15.5                           | 17.6 | 11.0        | 16.4                | 13.7 | +5.4  |
|                                 | 1951         |   | 13.3                                    | 12.9                           | 12.3 | 9.1         | 16.9                | 13.0 | +7.8  |
|                                 | 1950         |   | 17.4                                    | 9.8                            | 12.8 | 8.6         | 16.9                | 12.8 | +8.3  |
| Rock phosphate                  | 1954         |   | 15.2                                    | 13.1                           | 13.6 | 8.6         | 18.5                | 13.6 | +9.9  |
|                                 | 1953         |   | 12.4                                    | 11.4                           | 12.1 | 11.7        | 17.2                | 14.4 | +5.5  |
|                                 | 1952         | None  | 11.2                                    | 10.0                           | 11.2 | 8.1         | 16.0                | 12.0 | +7.9  |
|                                 | 1951         |   | 11.2                                    | 13.3                           | 12.2 | 10.7        | 17.2                | 14.0 | +6.5  |
|                                 | 1950         |   | 9.8                                     | 11.4                           | 10.5 | 7.5         | 13.3                | 10.4 | +5.8  |
| Mean dry matter % as harvested: |              |   |   |                                |      |             |                     |      | 87.0  |
| Mean dry matter % as harvested: |              |   |   |                                |      |             |                     |      | 84.9  |