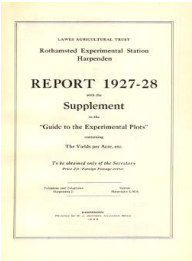
ROTHAMSTED RESEARCH

# Report for 1927-28

*Full Table of Content*




## The Classical Experiments

### Rothamsted Research

Rothamsted Research (1928) *The Classical Experiments ;* Report For 1927-28, pp 119 - 130 **- DOI: https://doi.org/10.23637/ERADOC-1-85**

# DATES OF SOWING AND HARVESTING (HARVEST 1927).

| Field. | Crop. | Variety. | Sowing began. | Sowing finished. | Cutting began. | Carting began.* | Carting finished.* | Yield † per acre. |
|---|---|---|---|---|---|---|---|---|
| Gt. Knott, East ... | Wheat ... | Bountiful / Cambridge Browick | Oct. 12, '26 | Oct. 14, '26 | Aug. 17, '27 | Aug. 29, '27 | Aug. 30, '27 | 22 cwt. |
| Gt. Knott, West | Wheat ... | Million III ... ... | Oct. 7, '26 | Oct. 7, '26 | Aug. 23, '27 | Sept. 5, '27 | Sept. 5, '27 | 25 cwt. |
| Little Knott ... | Fallow ... / Grass ... | — | — | — | July 21, '27 | July 26, '27 | July 29, '27 | — |
| Fosters, East ... | Winter Oats / Spring Oats | Grey, Black ... ... | Oct. 11, '26 | Oct. 12, '26 | Aug. 4, '27 | Aug. 24, '27 | Aug. 27, '27 | 20 cwt. |
| | | Swedish King ... ... | Feb. 18, '27 | Feb. 18, '27 | Sept. 1, '27 | Sept. 7, '27 | Sept. 7, '27 | 22 cwt. |
| Fosters, West ... | Lucerne ... | Provence ... ... | Apr. 10, '26 | Apr. 10, '26 | July 19, '27 | — | — | — |
| West Barnfield ... | Clover ... | Late Flowering Red ... | Mar. 30, '26 | Mar. 30, '26 | June 14, '27 | June 27, '27 | June 28, '27 | — |
| Long Hoos, East... | Potatoes ... | Arran Comrade ... | May 24, '27 | May 25, '27 | — | Oct. 7, '27 | Nov. 1, '27 | 7 tons |
| | Swedes ... | Dreadnought ... ... | June 14, '27 | July 4, '27 | — | Oct. 27, '27 | Jan. 19, '28 | 19 tons |
| Long Hoos, West ... | Sugar Beet | Dutch Seed ... ... | June 11, '27 | June 13, '27 | — | Nov. 21, '27 | Jan. 18, '28 | 3½ tons |
| New Zealand ... | Clover ... | Late Flowering Red ... | April 1, '26 | April 1, '26 | June 21, '27 | July 6, '27 | July 11, '27 | 35 cwt. |
| Stackyard ... | Wheat ... | Little Joss ... ... | Oct. 28, '26 | Nov. 1, '26 | Aug. 22, '27 | Aug. 31, '27 | Aug. 31, '27 | 17 cwt. |
| Gt. Harpenden ... | Barley ... | Spratt Archer ... ... | April 4, '27 | April 5, '27 | Sept. 6, '27 | Sept. 20, '27 | Oct. 5, '27 | 9 cwt. |
| | Spring Wheat | Little Joss ... ... | Mar. 9, '27 | Mar. 9, '27 | Sept. 5, '27 | Sept. 12, '27 | Sept. 13, '27 | 16 cwt. |
| Sawpit ... ... | Fallow ... | — | — | — | — | — | — | — |
| Sawyers ... ... | Wheat ... | Million III ... ... | Oct. 6, '26 | Oct. 6, '26 | Aug. 15, '27 | Aug. 26, '27 | Aug. 29, '27 | 22 cwt. |
| | Spring Oats | Victory ... ... | Feb. 18, '27 | Feb. 19, '27 | Aug. 22, '27 | Aug. 30, '27 | Sept. 1, '27 | 22 cwt. |
| Broadbalk ... | Wheat ... / Fallow ... | Red Standard ... ... | Oct. '8, '26 | Oct. 8, '26 | Aug. 26, '27 | Sept. 2, '27 | Sept. 3, '27 | See p. 129. |
| Little Hoos ... | Barley ... | Plumage Archer ... | April 16, '27 | April 19, '27 | Sept. 2, '27 | Sept. 8, '27 | Sept. 13, '27 | 15 cwt. |
| Hoos ... ... | Barley ... | Spratt Archer ... ... | Mar. 25, '27 | Mar. 25, '27 | Sept. 1, '27 | Sept. 8, '27 | Sept. 21, '27 | See p. 130. |
| Barnfield ... ... | Swedes ... | Purple Top ... ... | June 22, '27 | June 22, '27 | — | Nov. 4, '27 | Nov. 19, '27 | See p. 125. |
| Agdell ... ... | Wheat ... | Red Standard ... ... | Oct. 8, '26 | Oct. 8, '26 | Aug. 15, '27 | Aug. 26, '27 | Aug. 26, '27 | See p. 124. |
| Greatfield ... ... | Grazing ... | — | — | — | — | — | — | — |
| Park ... ... | Hay ... | — | — | — | July 5, '27 | July 18, '27 | July 19, '27 | See p. 126. |

* In the case of roots, the dates given are those on which lifting began and finished. † Estimated yields.

# DATES OF SOWING AND HARVESTING (HARVEST 1928).

| Field. | Crop. | Variety. | Sowing began. | Sowing finished. | Cutting began. | *Carting began. | *Carting finished. | Yield † per acre. |
|---|---|---|---|---|---|---|---|---|
| Gt. Knott ... | Wheat ... | Million III ... ... | Nov. 4, '27 | Nov. 5, '27 | Aug. 15, '28 | Aug. 29, '28 | Aug. 30, '28 | 9 cwt. |
| Gt. Knott ... | Spring Oats | Swedish King ... ... | Feb. 28, '28 | Feb. 29, '28 | Aug. 14, '28 | Aug. 30, '28 | Aug. 30, '28 | 9 cwt. |
| Gt. Knott ... | Rape ... | — | May 22, '28 | June 18, '28 | — | — | — | — |
| Little Knott ... | Grazing ... | — | — | — | — | — | — | — |
| Fosters ... ... | Wheat ... | Little Joss ... ... | Nov. 7, '27 | Nov. 14, '27 | Aug. 16, '28 | Aug. 28, '28 | Aug. 29, '28 | 15½ cwt. |
| West Barnfield ... | Wheat ... | Million III ... ... | Oct. 19, '27 | Oct. 20, '27 | Aug. 11, '28 | Aug. 21, '28 | Aug. 24, '28 | 16½ cwt. |
| Long Hoos, East ... Long Hoos, West | Barley ... | Standwell ... Plumage Archer | Feb. 19, '28 | Feb. 29, '28 | Aug. 9, '28 | Aug. 18, '28 | Sept. 5, '28 | 14 cwt. |
| New Zealand ... | Wheat ... | Million III ... ... | Nov. 2, '27 | Nov. 4, '27 | Aug. 20, '28 | Aug. 31, '28 | Aug. 31, '28 | 16 cwt. |
| Stackyard ... ... | Winter Oats | Grey ... ... ... | Oct. 7, '27 | Oct. 8, '27 | July 28, '28 | Aug. 9, '28 | Aug. 9, '28 | 22 cwt. |
| Gt. Harpenden ... | Sugar Beet | Dippe ... ... | May 5, '28 | May 5, '28 | — | Oct. 26, '28 | Nov. 3, '28 | 9 tons |
| Gt. Harpenden ... | Potatoes ... | Eclipse, Ally and Majestic | April 17, '28 | April 20, '28 | — | Oct. 10, '28 | Oct. 16, '28 | Ec. 6 tons<br>Al. 8½ tons<br>Ma .8 tons |
| Gt. Harpenden ... | Swedes ... | Buffalo, and Picton ... | May 9, '28 | May 9, '28 | — | Nov. 21, '28 | Dec. 19, '28 | Pi. 18 tons<br>Bu. 21 tons |
| Pastures ... ... | Wheat ... | Swedish Iron, Squareheads Master, Yeoman II and Million III | Oct. 20, '27 | Oct. 21, '27 | Aug. 13, '28 | Aug. 29, '28 | Aug. 30, '28 | 24 cwt.<br>See p. 136. |
| Sawyers ... ... | Barley ... | Standwell and Plumage Archer | April 10, '28 | April 10, '28 | Aug. 21, '28 | Sept. 3, '28 | Sept. 5, '28 | 14 cwt. |
| Broadbalk ... | Wheat ... | Red Standard ... ... | Oct. 18, '27 | Oct. 18, '27 | Aug. 6, '28 | Aug. 16, '28 | Aug. 16, '28 | See p. 129. |
| Broadbalk ... | Fallow ... | — | — | — | — | — | — | — |
| Little Hoos ... | Clover ... | Broad Red Hay ... | April 19, '27 | April 19, '27 | June 22, '28 | June 28, '28 | June 29, '28 | 28 cwt. |
| | | Broad Red Seed ... | April 19, '27 | April 19, '27 | Sept. 19, '28 | Oct. 2, '28 | Oct. 3, '28 | 3¼ cwt. |
| Hoos ... ... | Barley ... | Plumage Archer ... | April 27, '28 | April 27, '28 | Oct. 1, '28 | Oct. 22, '28 | Oct. 22, '28 | See p. 130. |
| Barnfield ... ... | Mangolds ... | Prize-winner ... ... | May 2, '28 | May 2, '28 | — | Nov. 5, '28 | Nov. 14, '28 | See p. 125. |
| Agdell ... ... | Swedes ... | Dreadnought ... ... | May 25, '28 | May 25, '28 | — | Nov. 14, '28 | Nov. 20, '28 | See p. 124. |
| Greatfield ... ... | Grazing ... | — | — | — | — | — | — | — |
| Park ... ... | Hay ... | — | — | — | June 25, '28 | July 2, '28 | July 2, '28 | See p. 126. |

* In the case of roots, the dates given are those on which lifting began and finished. † Estimated yields.

# CROP YIELDS ON THE EXPERIMENTAL PLOTS.

NOTES.—In each case the year refers to the harvest, *e.g.*, Wheat 1928 means wheat harvested in 1928. In the tables, total straw includes straw, cavings and chaff. These were weighed separately prior to 1928. In 1928 the figure given as total straw was arrived at as the difference : total sheaf weight—weight of grain.

## CONVERSION TABLE.

| | | |
|---|---|---|
| 1 acre ... ... = | 0.405 Hectare ... ... ... | 0.963 Feddan. |
| 1 bushel (Imperial) = | 0.364 Hectolitre (36.364 litres) ... | 0.184 Ardeb. |
| 1 lb.(pound avoirdupois)= | 0.453 Kilogramme ... ... | 1.009 Rotls. |
| 1 cwt. (hundredweight, 112 lb.) ... ... = | 50.8 Kilogrammes ... ... | 113.0 Rotls.<br>1.366 Maunds. |
| 1 ton (20 cwt. or 2240 lb.)= | 1016 Kilogrammes | |
| 1 metric quintal or Doppel Zentner(dz) = | 100.0 Kilogrammes.<br>220.46 lbs. | |
| 1 bushel per acre ... = | 0.9 Hectolitre per Hectare ... | 0.191 Ardeb per Feddan |
| 1 lb. per acre ... = | 1.12 Kilogramme per Hectare ... | 1.049 Rotls per Feddan |
| 1 cwt. per acre ... = | 1.256 metric Quintals per Hectare | 117.4 Rotls per Feddan |
| 1 ton per acre ... = | 25.12 metric Quintals per Hectare (dz/ha). | |

In America the Winchester bushel is used=35.236 litres. 1 English bushel=1.032 American bushels.

## CONVERSION TABLE.—CWTS. TO BUSHELS.

| CROP. | Cwts. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 | 25 | 30 |
| Wheat (60 lb.) bushels | 1.87 | 3.73 | 5.60 | 7.47 | 9.33 | 18.67 | 28.00 | 37.33 | 46.67 | 56.00 |
| Barley (52 lb.) „ | 2.15 | 4.31 | 6.46 | 8.62 | 10.77 | 21.54 | 32.31 | 43.08 | 53.85 | 64.62 |
| Oats (42 lb.) „ | 2.67 | 5.33 | 8.00 | 10.67 | 13.33 | 26.67 | 40.00 | 53.33 | 66.67 | 80.00 |

The yields of Grain in the 1925-26 Report were given for the Replicated Experiments in standard bushels of 60, 52 and 42 lb. respectively.

## Average Wheat Yield of Various Countries.

| Country. | Mean yield per acre, 1919-27. Cwts. | Country. | Mean yield per acre, 1919-27. Cwts. |
|---|---|---|---|
| Great Britain ... ... ... | 17.4 | Denmark ... ... ... | 22.5 |
| England ... ... ... | 17.3 | Argentine ... ... ... | 6.6 |
| Hertfordshire ... ... | 16.3 | Australia ... ... ... | 6.6 |
| France ... ... ... | 10.8 | Canada ... ... ... | 8.6 |
| Germany ... ... ... | 14.1 | United States ... ... | 7.5 |
| Belgium ... ... ... | 20.0 | U.R.S.S. (Europe and Asia)* | 5.7 |

NOTE.—Figures for Great Britain, England and Hertfordshire are taken from the Ministry of Agriculture's "Agricultural Statistics," Vol. 62. Other figures from "International Year Book of Agricultural Statistics," 1922-28.
* 1924-27.

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# METEOROLOGICAL RECORDS, 1927 and 1928.

| | Rain. | | Drainage through soil. | | | Bright Sunshine. | Temperature (Mean). | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Fall $\frac{1}{1000}$th Acre Gauge. | No. of Rainy Days. (0.01 inch or more) $\frac{1}{1000}$th Acre Gauge. | 20 ins. deep. | 40 ins. deep. | 60 ins. deep. | | Max. | Min. | 1 ft. in ground. | Solar Max. | Grass Min. |
| 1927. | Inches. | No. | Inches. | Inches. | Inches. | Hours. | °F. | °F. | °F. | °F. | °F. |
| Jan. ... | 2.408 | 18 | 1.865 | 1.995 | 1.842 | 62.9 | 43.9 | 33.5 | 38.3 | 72.3 | 29.4 |
| Feb. ... | 3.982 | 15 | 3.435 | 3.630 | 3.496 | 46.0 | 43.1 | 33.1 | 37.8 | 73.9 | 29.8 |
| Mar. ... | 2.384 | 18 | 0.960 | 1.113 | 1.038 | 124.9 | 50.5 | 38.8 | 42.6 | 101.4 | 33.2 |
| April ... | 1.855 | 12 | 1.205 | 1.588 | 1.484 | 165.6 | 53.0 | 38.6 | 46.0 | 114.9 | 33.3 |
| May ... | 1.187 | 11 | 0.000 | 0.019 | 0.019 | 226.4 | 61.6 | 42.9 | 52.7 | 121.5 | 37.6 |
| June ... | 3.564 | 19 | 0.745 | 0.739 | 0.723 | 183.7 | 62.5 | 46.8 | 56.3 | 127.8 | 42.1 |
| July ... | 3.112 | 20 | 1.651 | 2.073 | 1.889 | 130.4 | 65.4 | 53.6 | 59.4 | 121.8 | 49.5 |
| Aug. ... | 4.348 | 19 | 1.852 | 2.100 | 1.967 | 178.4 | 66.8 | 53.2 | 60.4 | 129.6 | 48.2 |
| Sept. ... | 5.451 | 17 | 3.704 | 3.899 | 3.823 | 111.3 | 59.7 | 48.1 | 56.2 | 111.5 | 43.8 |
| Oct. ... | 2.197 | 17 | 1.268 | 1.413 | 1.342 | 97.5 | 56.4 | 44.0 | 50.6 | 97.4 | 38.7 |
| Nov. ... | 3.008 | 18 | 2.338 | 2.682 | 2.366 | 54.6 | 46.4 | 36.5 | 44.7 | 72.1 | 33.2 |
| Dec. ... | 3.013 | 12 | 2.464 | 2.853 | 2.761 | 31.5 | 37.0 | 30.5 | 38.5 | 51.2 | 28.8 |
| Total or Mean ... | 36.509 | 196 | 21.487 | 24.104 | 22.750 | 1413.2 | 53.9 | 41.6 | 48.6 | 99.6 | 37.3 |
| 1928. | | | | | | | | | | | |
| Jan. ... | 4.109 | 21 | 4.413 | 5.662 | 4.571 | 64.9 | 45.9 | 33.3 | 37.6 | 73.1 | 29.2 |
| Feb. ... | 2.075 | 10 | 1.447 | 1.832 | 1.710 | 100.2 | 48.0 | 35.0 | 39.5 | 88.2 | 29.7 |
| Mar. ... | 2.404 | 17 | 1.093 | 1.318 | 1.283 | 92.8 | 48.1 | 36.1 | 41.3 | 94.0 | 31.7 |
| April ... | 0.905 | 13 | 0.351 | 0.646 | 0.589 | 127.3 | 52.9 | 38.1 | 45.1 | 103.3* | 32.7† |
| May ... | 1.448 | 12 | 0.066 | 0.170 | 0.136 | 169.8 | 59.2 | 42.2 | 50.9 | 112.8 | 37.3 |
| June ... | 2.204 | 14 | 0.160 | 0.279 | 0.246 | 230.0 | 63.5 | 47.3 | 56.8 | 124.0 | 42.6 |
| July ... | 2.511 | 6 | 0.457 | 0.439 | 0.434 | 276.3 | 71.9 | 52.9 | 62.9 | 129.8 | 47.3 |
| Aug. ... | 2.216 | 12 | 0.496 | 0.734 | 0.672 | 193.0 | 66.5 | 52.1 | 60.3 | 121.9 | 47.7 |
| Sept. ... | 0.785 | 4 | 0.000 | 0.039 | 0.017 | 212.0 | 63.7 | 46.3 | 56.2 | 116.1 | 38.8 |
| Oct. ... | 3.867 | 19 | 2.287 | 2.458 | 2.284 | 126.5 | 56.4 | 43.1 | 49.8 | 98.2 | 38.0 |
| Nov. ... | 3.161 | 16 | 2.217 | 2.647 | 2.447 | 72.1 | 50.4 | 39.7 | 45.2 | 80.4 | 36.3 |
| Dec. ... | 2.773 | 17 | 2.045 | 2.485 | 2.341 | 48.9 | 41.7 | 32.1 | 38.5 | 61.7 | 28.4 |
| Total or Mean | 28.458 | 161 | 15.032 | 18.709 | 16.730 | 1713.8 | 55.7 | 41.5 | 48.7 | 100.3 | 36.6 |

* Mean of 21 observations only.
† Mean of 29 observations only.

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## RAIN AND DRAINAGE.
## MONTHLY MEAN FOR 58 HARVEST YEARS, 1870-1—1927-8.

| | Rainfall. | Drainage. | | | Drainage % of Rainfall. | | | Evaporation. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 20-in. Gauge. | 40-in. Gauge. | 60-in. Gauge. | 20-in. Gauge. | 40-in. Gauge. | 60-in. Gauge. | 20-in. Gauge. | 40-in. Gauge. | 60-in. Gauge. |
| | Ins. | Ins. | Ins. | Ins. | % | % | % | Ins. | Ins. | Ins. |
| September | 2.426 | 0.832 | 0.805 | 0.742 | 34.3 | 33.2 | 30.6 | 1.594 | 1.621 | 1.684 |
| October ... | 3.135 | 1.808 | 1.772 | 1.647 | 57.7 | 56.5 | 52.5 | 1.327 | 1.363 | 1.488 |
| November | 2.774 | 2.102 | 2.149 | 2.024 | 75.8 | 77.5 | 73.0 | 0.672 | 0.625 | 0.750 |
| December | 2.819 | 2.403 | 2.496 | 2.383 | 85.2 | 88.5 | 84.5 | 0.416 | 0.323 | 0.436 |
| January | 2.419 | 1.984 | 2.182 | 2.083 | 82.0 | 90.2 | 86.1 | 0.435 | 0.237 | 0.336 |
| February | 2.073 | 1.547 | 1.656 | 1.581 | 74.6 | 79.9 | 76.3 | 0.526 | 0.417 | 0.492 |
| March ... | 2.040 | 1.088 | 1.221 | 1.154 | 53.3 | 59.9 | 56.6 | 0.952 | 0.819 | 0.886 |
| April ... | 2.030 | 0.664 | 0.743 | 0.708 | 32.7 | 36.6 | 34.9 | 1.366 | 1.287 | 1.322 |
| May ... | 2.029 | 0.469 | 0.534 | 0.501 | 23.1 | 26.3 | 24.7 | 1.560 | 1.495 | 1.528 |
| June ... | 2.267 | 0.557 | 0.586 | 0.564 | 24.6 | 25.8 | 24.9 | 1.710 | 1.681 | 1.703 |
| July ... | 2.748 | 0.737 | 0.766 | 0.712 | 26.8 | 27.9 | 25.9 | 2.011 | 1.982 | 2.036 |
| August ... | 2.683 | 0.715 | 0.728 | 0.683 | 26.6 | 27.1 | 25.5 | 1.968 | 1.955 | 2.000 |
| Year ... | 29.443 | 14.906 | 15.638 | 14.782 | 50.6 | 53.1 | 50.2 | 14.557 | 13.805 | 14.661 |

Area of each gauge $\frac{1}{1000}$th acre.

## CHEMICAL ANALYSES OF FERTILISERS USED IN REPLICATED EXPERIMENTS, 1927-8.

| Fertiliser. | % N | % water-sol. $P_2O_5$ | % $K_2O$ |
|---|---|---|---|
| Sulphate of Ammonia ... | 20.67-21.20 | — | — |
| Muriate of Ammonia ... | 25.54-26.08 | — | — |
| Nitrate of Soda ... ... | 15.37 | — | — |
| Urea ... ... ... ... | 46.48 | — | — |
| Cyanamide ... ... ... | 19.39–19.75 | — | — |
| Nitrochalk ... ... ... | 10.00 | — | — |
| Ammonium Phosphate ... | 12.15 | 61.6 | — |
| Superphosphate ... ... | — | 16.79-16.94 | — |
| Potassium Phosphate ($K_2HPO_4$) ... ... | — | 40.80 | 54.03 |
| Sulphate of Potash ... | — | — | 49.48-49.58 |
| Muriate of Potash ... ... | — | — | 51.00-51.83 |
| Potash Manure Salts (30%) | — | — | 32.60 |
| Nitrophoska ... ... | 10.3 as $NH_4$ : 5.3 as $NO_3$ | 12.86 | 25.9 |
| Compound Fertiliser " B "... | 10.09 | 9.90 | 18.25 |

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# First Series: Classical Experiments of Lawes and Gilbert.

## CROPS GROWN IN ROTATION.

## AGDELL FIELD.

### PRODUCE PER ACRE.

| Year. | CROP. | | O. Unmanured since 1848. 5. Fallow. | O. 6. Clover or Beans. | M. ‡ Mineral Manure. No Nitrogen. 3. Fallow. | M. 4. Clover or Beans. | C. ‡ Complete Mineral & Nitrogenous Manure. 1. Fallow. | C. 2. Clover or Beans. |
|---|---|---|---|---|---|---|---|---|
| **Average of First Twenty Courses, 1848-1927.** | | | | | | | | |
| | Roots (Swedes) | cwt.* | 32.7 | 11.2 | 175.7 | 195.9 | 355.3 | 302.1 |
| | Barley— | | | | | | | |
| | Dressed Grain | bush. | 22.2 | 20.2 | 23.1 | 27.4 | 31.1 | 35.4 |
| | Total Straw† | cwt. | 13.6 | 13.4 | 13.7 | 15.7 | 18.8 | 21.8 |
| | Beans— | | | | | | | |
| | Dressed Grain | bush. | — | 13.1 | — | 18.2 | — | 22.3 |
| | Total Straw | cwt. | — | 9.2 | — | 13.2 | — | 15.3 |
| | Clover Hay | cwt. | — | 27.1 | — | 52.3 | — | 52.6 |
| | Wheat— | | | | | | | |
| | Dressed Grain | bush. | 24.0 | 22.3 | 28.1 | 30.6 | 28.9 | 30.4 |
| | Total Straw† | cwt. | 23.4 | 21.6 | 28.6 | 29.8 | 30.8 | 29.8 |
| **Twentieth Course, 1924-27.** | | | | | | | | |
| 1924 | Roots (Turnips) | cwt. | 2.9 | 0.7 | 42.8 | 31.5 | 127.4 | 104.7 |
| 1925 | Barley— | | | | | | | |
| | Dressed Grain | bush. | 10.86 | 7.35 | 10.09 | 16.70 | 10.35 | 8.60 |
| | Offal Grain | lb. | 42.0 | 49.0 | 94.0 | 38.0 | 53.0 | 59.0 |
| | Straw | lb. | 633.0 | 678.0 | 602.0 | 866.0 | 626.0 | 541.0 |
| | Total Straw† | cwt. | 7.2 | 7.5 | 7.4 | 9.3 | 7.0 | 6.5 |
| | Wt. of Dressed Grain per bushel | lb. | 52.7 | 51.6 | 52.5 | 53.6 | 53.3 | 54.3 |
| | Proportion of Total Grain to 100 of Total Straw | | 76.3 | 50.7 | 75.5 | 89.2 | 77.0 | 72.4 |
| 1926 | Clover Hay | cwt. | — | 14.2 | — | 32.2 | — | 26.3 |
| 1927 | Wheat— | | | | | | | |
| | Dressed Grain | bush. | 20.15 | 12.86 | 19.07 | 19.01 | 16.28 | 15.77 |
| | Offal Grain | lb. | 57.0 | 66.0 | 73.0 | 72.0 | 47.0 | 53.0 |
| | Straw | lb. | 1859.0 | 1846.0 | 2111.0 | 1932.0 | 1878.0 | 1693.0 |
| | Total Straw† | cwt. | 18.6 | 19.6 | 21.8 | 20.5 | 19.1 | 17.4 |
| | Wt. of Dressed Grain per bush. | lb. | 60.1 | 61.2 | 59.6 | 60.6 | 59.5 | 59.8 |
| | Proportion of Total Grain to 100 of Total Straw | | 60.9 | 38.9 | 49.6 | 53.3 | 47.5 | 51.2 |
| **Present Course (21st), 1928.** | | | | | | | | |
| 1928 | Roots (Swedes) | cwt. | 19.7 | 11.7 | 143.8 | 163.6 | 293.2 | 223.2 |

* Plots 1, 3 and 5 based upon 18 years. Plots 2, 4 and 6 based upon 17 years.
† Includes straw, cavings and chaff.
Manures applied once every four years, prior to sowing of swedes.
‡ Mineral Manure: 528 lb. superphosphate (35%); 500 lb. Sulphate of Potash; 100 lb. Sulphate of Soda; 200 lb. Sulphate of Magnesia. All per acre.
Nitrogenous Manure. 206 lb. Sulphate of Ammonia and 2,000 lb. Rape cake per acre.

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# MANGOLDS—BARNFIELD, 1927 and 1928.

**Roots each year since 1856. Mangolds each year since 1876.**

## PRODUCE PER ACRE.

| | Strip. | Strip Manures. (Amounts stated as per acre). | 1927.† Cross Dressings. O None. | N Nitrate of Soda (550 lbs.) | A Sulphate of Amm'nia (412 lbs.) | AC Sulphate of Amm'nia (412 lbs.) & Rape Cake | C Rape Cake (2,000 lbs.) | 1928. Cross Dressings. O None. | N Nitrate of Soda (550 lbs.) | A Sulph at of Amm'nia (412 lbs.) | AC Sulphate of Amm'nia (412 lbs.) & Rape Cake | C Rape Cake (2,000 lbs.) | 50-year Average 1876–1928.†† Cross Dressings. O None. | N Nitrate of Soda (550 lbs.) | A Sulphate of Amm'nia (412 lbs.) | AC Sulphate of Amm'nia (412 lbs.) & Rape Cake | C Rape Cake (2,000 lbs.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOTS. | | | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons |
| | 1 | Dung only (14 tons) ... ... ... | 12.22 | 15.02 | 15.66 | 16.92 | 14.39 | 12.11 | 27.07 | 20.33 | 18.30 | 16.21 | 17.47 | 26.16 | 21.70 | 23.58 | 23.53 |
| | 2 | Dung, Superphosphate (3½ cwts.), Sulphate of Potash (500 lbs.) ... | 10.01 | 14.77 | 15.41 | 17.34 | 15.37 | 16.53 | 29.25 | 26.98 | 29.15 | 24.68 | 18.94 | 26.68 | 24.71 | 27.57 | 26.50 |
| | 4 | Complete Minerals: Super and Potash as 2, Salt (200 lb.) Sulphate of Magnesia (200 lb.) ... ... ... | 1.07 | (*a*) 7.90* (*b*) 6.69 | 6.59 | 13.42 | 9.50 | 4.25 | (*a*)23.30* (*b*)21.84 | 19.80 | 29.22 | 23.67 | 4.60 | (*a*)18.11** (*b*)17.81 | 14.37 | 26.06 | 20.96 |
| | 5 | Superphosphate only (3½ cwt.) ... | 1.77 | 6.90 | 8.08 | 12.79 | 10.89 | 3.47 | 18.44 | 9.39 | 9.55 | 10.68 | 4.47 | 14.63 | 6.70 | 9.49 | 10.16 |
| | 6 | Super (3½ cwt.) Sulphate of Potash (500 lbs.) ... ... ... ... | 0.98 | 4.04 | 4.39 | 10.96 | 7.51 | 4.03 | 19.15 | 18.26 | 24.73 | 19.76 | 4.03 | 15.12 | 13.50 | 22.55 | 18.14 |
| | 7 | Super (3½ cwt.) Sulphate of Magnesia (200 lbs.) and Sodium Chloride (200 lbs.) ... ... ... ... ... | 1.20 | 5.37 | 4.97 | 12.20 | 8.65 | 4.17 | 20.12 | 18.93 | 24.62 | 21.40 | 4.86 | 16.04 | 14.70 | 22.31 | 19.10 |
| | 8 | No Minerals ... ... ... ... | 1.17 | 3.36 | 4.35 | 10.54 | 9.07 | 2.85 | 11.65 | 6.05 | 8.89 | 9.24 | 3.34 | 9.61 | 5.32 | 8.52 | 8.89 |
| | 9 | Sodium Chloride (200 lbs.), Nit. Soda (550 lb.), Sulph. Potash (500 lbs.) and Sulph. Mag. (200 lbs.) ... ... | 6.05 | — | — | — | — | 21.27 | — | — | — | — | — | — | — | — | — |
| LEAVES. | | | | | | | | | | | | | | | | | |
| | 1 | Dung only (14 tons) ... ... | 3.14 | 3.17 | 3.63 | 4.51 | 4.01 | 2.97 | 4.47 | 3.79 | 3.22 | 2.60 | 3.04 | 4.65 | 4.93 | 5.25 | 4.54 |
| | 2 | Dung, Superphosphate (3½ cwts.), Sulphate of Potash (500 lbs.) ... | 2.35 | 3.43 | 3.73 | 4.79 | 4.08 | 2.82 | 4.50 | 4.52 | 6.07 | 4.66 | 3.16 | 5.15 | 5.49 | 6.29 | 4.80 |
| | 4 | Complete Minerals: Super and Potash as 2, Salt (200 lbs.), Sulphate of Magnesia (200 lbs.) ... ... ... | 0.23 | (*a*) 1.50* (*b*) 1.37 | 1.60 | 3.89 | 2.35 | 0.85 | (*a*) 3.47* (*b*) 3.73 | 2.41 | 5.01 | 3.40 | 1.04 | (*a*)4.05** (*b*) 4.09 | 2.88 | 5.33 | 3.37 |
| | 5 | Superphosphate only (3½ cwts.) ... | 0.41 | 1.17 | 1.70 | 3.59 | 2.67 | 0.99 | 2.60 | 2.58 | 2.83 | 2.75 | 1.05 | 3.19 | 2.61 | 3.29 | 2.84 |
| | 6 | Super (3½ cwts.), Sulphate of Potash (500 lbs.) ... ... ... ... | 0.25 | 0.66 | 0.72 | 2.44 | 1.31 | 0.87 | 2.05 | 2.31 | 4.60 | 2.61 | 0.93 | 3.04 | 2.81 | 5.20 | 2.87 |
| | 7 | Super (3½ cwts.), Sulphate of Magnesia (200 lbs.) and Sodium Chloride (200 lbs.) ... ... ... ... ... | 0.28 | 0.62 | 0.63 | 2.52 | 1.21 | 0.92 | 3.08 | 3.13 | 5.05 | 3.47 | 1.10 | 3.31 | 3.01 | 5.23 | 3.31 |
| | 8 | No Minerals ... ... ... ... | 0.30 | 0.54 | 0.92 | 2.90 | 1.92 | 0.86 | 3.76 | 2.75 | 3.27 | 2.99 | 0.98 | 3.19 | 2.52 | 3.30 | 2.84 |
| | 9 | Sodium Chloride (200 lbs.), Nit. Soda (550 lbs.), Sulph. Potash (500 lbs.) and Sulph. Mag. (200 lbs.) ... | 0.91 | — | — | — | — | 3.78 | — | — | — | — | — | — | — | — | — |

* From 1904 onwards plot 4 N has been divided, 4 (*a*) receiving Sulphate of Potash, Sulphate of Magnesia, Sodium Chloride and Nitrate of Soda, amounts as above; 4 (*b*) receiving Calcium Chloride (190 lbs.), Potassium Nitrate (570 lbs.), and Calcium Nitrate (100 lbs.). Nitrogenous manures are applied as to one-third at time of sowing and two-thirds as top dressing at a later date, except with Rape Cake which all goes on with seed.

† In 1927 Mangolds failed and the whole field was re-sown with Swedes. In this year only one-third of the nitrogen was supplied, this being given at time of sowing of mangolds.

†† Excluding 1885, when nitrogenous fertilisers were not applied, owing to poor crop, and 1908 and 1927 when the crop was swedes.

** 23 years only, 1904–1928.

# HAY—THE PARK GRASS PLOTS, 1927-1928.

| Plot. | Manuring (amounts stated are per acre). | | 1927 Yield of Hay per acre. 1st Crop. | 2nd§ Crop. | Total. | 1927 Dry Matter per acre. 1st Crop. | 2nd Crop. | Total. | 1928 Yield of Hay per acre. 1st Crop. | 2nd§ Crop. | Total. | 1928 Dry Matter per acre. 1st Crop. | 2nd Crop. | Total. | Plot. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | cwt. | cwt. | cwt. | lb. | lb. | lb. | cwt. | cwt. | cwt. | lb. | lb. | lb. | |
| 1 | Single dressing (206 lb.) Sulphate of Ammonia (=43 lb. N.); (with Dung also 8 years 1856–63) ... ... ... | not limed | 5.0 | 11.8 | 16.8 | 427 | 1057 | 1484 | 8.0 | 3.2 | 11.2 | 652 | 286 | 938 | 1 |
| | | limed ... | 9.8 | 8.1 | 17.9 | 805 | 729 | 1534 | 14.8 | 4.2 | 19.0 | 1238 | 380 | 1618 | |
| 2 | Unmanured (after Dung 8 years, 1856–63) ... ... ... ... ... | not limed | 5.3 | 8.6 | 13.9 | 432 | 769 | 1201 | 11.2 | 3.3 | 14.5 | 904 | 299 | 1203 | 2 |
| | | limed ... | 4.4 | 6.1 | 10.5 | 336 | 543 | 879 | 12.0 | 1.7 | 13.7 | 948 | 152 | 1100 | |
| 3 | Unmanured ... ... ... ... | not limed | 4.5 | 5.5 | 10.0 | 346 | 492 | 838 | 9.3 | 2.1 | 11.4 | 742 | 188 | 930 | 3 |
| | | limed ... | 2.8 | 5.6 | 8.4 | 203 | 499 | 702 | 7.8 | 1.6 | 9.4 | 634 | 144 | 778 | |
| 4-1 | Superphosphate of Lime (3½ cwt.) ... | not limed | 6.0 | 8.0 | 14.0 | 434 | 714 | 1148 | 16.0 | 3.1 | 19.1 | 1236 | 275 | 1511 | 4-1 |
| | | limed ... | 3.1 | 7.4 | 10.5 | 221 | 659 | 880 | 8.5 | 2.0 | 10.5 | 649 | 179 | 828 | |
| 4-2 | Superphosphate of Lime (3½ cwt.) and double dressing (412 lb.) Sulphate of Ammonia (=86 lb. N.) ... ... | not limed | 4.9 | 12.6 | 17.5 | 368 | 1133 | 1501 | 11.6 | 2.0 | 13.6 | 1039 | 183 | 1222 | 4-2 |
| | | limed ... | 15.6 | 14.8 | 30.4 | 1430 | 1324 | 2754 | 32.2 | 7.3 | 39.5 | 2931 | 652 | 3583 | |
| 5-1 | (N. half) Unmanured following double dressing Amm. Salts (=86 lb. N.) 1856–97... ... ... ... ... | not limed | 5.5 | 5.8 | 11.3 | 433 | 519 | 952 | 6.0 | 3.7 | 9.7 | 492 | 327 | 819 | 5-1 |
| 5-2 | (S. half) Superphosphate (3½ cwt.); Sulphate of Potash (500 lb.); following double dressing Amm. Salts (=86 lb. N.) 1856–97 ... ... ... ... | not limed | 10.2 | 13.0 | 23.2 | 787 | 1169 | 1956 | 14.8 | 6.6 | 21.4 | 1267 | 593 | 1860 | 5-2 |
| 6 | Complete Mineral Manure as Plot 7; following double dressing Amm. Salts (=86 lb. N.) 1856-68 ... ... ... | not limed | 17.7 | 12.1 | 29.8 | 1330 | 1084 | 2414 | 20.9 | 7.1 | 28.0 | 1796 | 639 | 2435 | 6 |
| 7 | Complete Mineral Manure: Super. (3½ cwt.); Sulphate of Potash (500 lb.); Sulphate of Soda (100 lb.); Sulphate of Magnesia (100 lb.). ... ... | not limed | 19.9 | 13.5 | 33.4 | 1320 | 1208 | 2528 | 21.7 | 13.1 | 34.8 | 1837 | 1177 | 3014 | 7 |
| | | limed ... | 14.8 | 12.8 | 27.6 | 1142 | 1149 | 2291 | 36.2 | 15.1 | 51.3 | 3117 | 1351 | 4468 | |
| 8 | Mineral Manure without Potash ... | not limed | 10.8 | 11.3 | 22.1 | 633 | 1016 | 1649 | 14.4 | 7.4 | 21.8 | 1149 | 658 | 1807 | 8 |
| | | limed ... | 7.2 | 7.9 | 15.1 | 488 | 704 | 1192 | 12.2 | 3.7 | 15.9 | 1096 | 328 | 1424 | |
| 9 | Complete Mineral Manure and double dressing (412 lb.) Sulphate of Ammonia (=86 lb. N.) ... ... ... | not limed | 30.8 | 20.4 | 51.2 | 2203 | 1826 | 4029 | 31.0 | 7.2 | 38.2 | 2646 | 645 | 3291 | 9 |
| | | limed ... | 42.6 | 21.0 | 63.6 | 3138 | 1881 | 5019 | 50.6 | 8.1 | 58.7 | 4628 | 723 | 5351 | |
| 10 | Mineral Manure (without Potash) and double dressing Amm. Salts (=86 lb. N.) ... ... ... ... ... | not limed | 10.5 | 14.5 | 25.0 | 759 | 1301 | 2060 | 22.3 | 5.0 | 27.3 | 1933 | 451 | 2384 | 10 |
| | | limed ... | 27.9 | 19.7 | 47.6 | 2276 | 1762 | 4038 | 39.0 | 10.9 | 49.9 | 3531 | 974 | 4505 | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11-1 | Complete Mineral Manure and treble dressing (618 lb.) Sulphate Ammonia (129 lb. N.) ... ... ... ... | not limed | 41.4 | 28.6 | 70.0 | 2849 | 2565 | 5414 | 52.9 | 13.7 | 66.6 | 3985 | 1223 | 5208 | 11-1 |
| | | limed ... | 32.9 | 23.8 | 56.7 | 2501 | 2132 | 4633 | 63.1 | 10.1 | 73.2 | 5574 | 906 | 6480 | |
| 11-2 | As Plot 11-1 and Silicate of Soda ... | not limed | 50.4 | 15.1 | 65.5 | 3257 | 1351 | 4608 | 61.9 | 14.5 | 76.4 | 4741 | 1302 | 6043 | 11-2 |
| | | limed ... | 43.1 | 16.3 | 59.4 | 3110 | 1458 | 4568 | 59.7 | 16.2 | 75.9 | 5252 | 1449 | 6701 | |
| 12 | Unmanured ... ... ... ... | not limed | 7.4 | 8.3 | 15.7 | 591 | 739 | 1330 | 10.9 | 6.9 | 17.8 | 812 | 621 | 1433 | 12 |
| 13 | Dung (14 tons) in 1905, and every fourth year since (omitted 1917), Fish Guano (6 cwt.) in 1907 and every fourth year since ... ... ... ... ... | not limed | 39.4 | 14.8 | 54.2 | 2689 | 1326 | 4015 | 46.6 | 11.8 | 58.4 | 3615 | 1056 | 4671 | 13 |
| | | limed ... | 35.5 | 14.8 | 50.3 | 2748 | 1329 | 4077 | 38.8 | 9.5 | 48.3 | 3178 | 855 | 4033 | |
| 14 | Complete Mineral Manure and double dressing (550 lb.) Nitrate of Soda (=86 lb. N.) ... ... ... ... | not limed | 48.1 | 16.7 | 64.8 | 3273 | 1492 | 4765 | 50.3 | 12.8 | 63.1 | 4534 | 1149 | 5683 | 14 |
| | | limed(sun) | 37.1 | 11.1 | 48.2 | 2709 | 997 | 3706 | 50.6 | 7.1 | 57.7 | 4304 | 632 | 4936 | |
| | | lmd.(shade) | 40.2 | 15.4 | 55.6 | 2590 | 1379 | 3969 | 39.2 | 7.7 | 46.9 | 3260 | 691 | 3951 | |
| 15 | Complete Mineral Manure as Plot 7; following double dressing Nitrate of Soda (=86 lb. N., 1858-1875) ... | not limed | 19.9 | 11.9 | 31.8 | 1554 | 1062 | 2616 | 25.7 | 7.9 | 33.6 | 2233 | 711 | 2944 | 15 |
| | | limed ... | 12.4 | 9.0 | 21.4 | 1028 | 808 | 1836 | 27.0 | 3.5 | 30.5 | 2332 | 314 | 2646 | |
| 16 | Complete Mineral Manure and single dressing (275 lb.) Nitrate of Soda (=43 lb. N.) ... ... ... ... | not limed | 32.9 | 11.9 | 44.8 | 2458 | 1062 | 3520 | 38.0 | 10.0 | 48.0 | 3270 | 893 | 4163 | 16 |
| | | limed ... | 26.6 | 9.9 | 36.5 | 1947 | 884 | 2831 | 35.6 | 6.2 | 41.8 | 3074 | 555 | 3629 | |
| 17 | Single dressing (275 lb.) Nitrate of Soda (=43 lb. N.) ... ... ... | not limed | 15.8 | 8.5 | 24.3 | 1031 | 765 | 1796 | 21.8 | 7.3 | 29.1 | 1690 | 652 | 2342 | 17 |
| | | limed ... | 12.7 | 9.6 | 22.3 | 1105 | 857 | 1962 | 24.7 | 4.1 | 28.8 | 2043 | 365 | 2408 | |
| 18 | Mineral Manure (without Super.), and double dressing Sulphate of Amm. (=86 lb. N.), 1905 and since; following Minerals and Amm. Salts supplying the constituents of 1 ton of Hay, 1865-1904 ... ... ... ... | not limed | 14.3 | 23.5 | 37.8 | 987 | 2106 | 3093 | 13.9 | 8.8 | 22.7 | 1293 | 787 | 2080 | 18 |
| | | limed 6788 lb. | 44.4 | 26.3 | 70.7 | 3222 | 2360 | 5582 | 48.2 | 11.2 | 59.4 | 4186 | 1002 | 5188 | |
| | | limed (3951 lb.) | 36.2 | 22.0 | 58.2 | 2370 | 1975 | 4345 | 31.5 | 6.9 | 38.4 | 2817 | 617 | 3434 | |
| 19 | Farmyard Dung (14 tons) in 1905 and every fourth year since (omitted in 1917), following Nitrate of Soda (=43 lb. N.) and Minerals, 1872-1904. | not limed | 19.9 | 13.3 | 33.2 | 1545 | 1193 | 2738 | 22.3 | 11.4 | 33.7 | 2034 | 1021 | 3055 | 19 |
| | | limed 3150 lb.) | 12.6 | 9.0 | 21.6 | 920 | 802 | 1722 | 18.4 | 6.6 | 25.0 | 1642 | 592 | 2234 | |
| | | limed (570 lb.) | 19.1 | 10.1 | 29.2 | 1450 | 904 | 2354 | 24.4 | 6.5 | 30.9 | 2165 | 584 | 2749 | |
| 20 | Farmyard Dung (14 tons) in 1905 and every fourth year since (omitted in 1917); each intervening year Plot 20 receives Sulphate of Potash (100 lb.); Superphosphate (200 lb.) and 1½ cwt. Nitrate of Soda (=26 lb. N.); following Nitrate of Potash and Superphosphate, 1872-1904 ... ... ... | not limed | 28.3 | 19.4 | 47.7 | 2217 | 1737 | 3954 | 37.3 | 10.3 | 47.6 | 3508 | 924 | 4432 | 20 |
| | | limed (2772 lb.) | 20.4 | 12.8 | 33.2 | 1647 | 1142 | 2789 | 34.7 | 6.2 | 40.9 | 3120 | 557 | 3677 | |
| | | limed (570 lb.) | 25.5 | 12.2 | 37.7 | 1924 | 1093 | 3017 | 37.5 | 6.7 | 44.2 | 3337 | 600 | 3937 | |

Ground lime was applied to the southern portion (limed) of the plots at the rate of 2000 lb. to the acre in the winters of 1903-4, 1907-8, 1915-16, 1923-24,and at the rate of 2500 lb. to the acre in the winter of 1920-21, except where otherwise stated.

Up to 1914 the limed and unlimed plot results were not separately given in the Annual Report, but the mean of the two was given. From 1915 onwards the separate figures are given.

§ The second crop was carted green; the figures given are estimated hay yields, calculated from the dry matter.

# The Park Grass Plots.

## BOTANICAL COMPOSITION, PER CENT., 1925, 1st CROP.

| Plot. | Manuring. | Liming. | Gramineæ. | Leguminosæ. | Other Orders | "Other Orders" consist largely of | Plot. |
|---|---|---|---|---|---|---|---|
| 3 | Unmanured ... ... ... | Limed ... | 73.4 | 5.4 | 21.2 | Plantago lanceolata ; Centaurea nigra ... ... ... | 3 |
| | | Unlimed ... | 61.1 | 5.1 | 33.8 | Plantago lanceolata ... ... ... ... ... ... | |
| 7 | Complete Mineral Manure ... | Limed ... | 75.2 | 1.2 | 23.6 | Heracleum sphondylium ; Rumex acetosa ... ... | 7 |
| | | Unlimed ... | 72.7 | 6.4 | 20.9 | Heracleum sphondylium ; Rumex acetosa ... ... | |
| 9 | Complete Mineral Manure and double Amm. Salts ... ... | Limed ... | 99.5 | 0.0 | 0.5 | —— ... ... ... ... ... ... ... ... | 9 |
| | | Unlimed ... | 96.7 | 0.0 | 3.3 | Heracleum sphondylium ; Rumex acetosa ... ... | |
| 14 | Complete Mineral Manure and double Nitrate of Soda ... | Limed (sun) | 83.6 | 0.0 | 16.4 | Anthriscus sylvestris ; Taraxacum vulgare ... ... | 14 |
| | | ,, (shade) | 90.6 | 5.7 | 3.7 | Anthriscus sylvestris ... ... ... ... ... ... | |
| | | Unlimed ... | 86.3 | 0.2 | 13.5 | Anthriscus sylvestris ; Taraxacum vulgare ; Rumex acetosa | |
| 15 | As plot 7 following double Nitrate of Soda, 1858–75 ... ... | Limed ... | 66.1 | 14.8 | 19.1 | Plantago lanceolata ; Ranunculus spp. ... ... ... | 15 |
| | | Unlimed ... | 62.1 | 4.7 | 33.2 | Plantago lanceolata ; Achillea millefolium ... ... | |
| 17 | Single Nitrate of Soda ... ... | Limed ... | 78.1 | 0.5 | 21.4 | Plantago lanceolata ; Centaurea nigra ... ... ... | 17 |
| | | Unlimed ... | 74.7 | 0.1 | 25.2 | Plantago lanceolata ... ... ... ... ... ... | |
| 18 | Mineral Manure (without Super.) and double Sulphate Amm. 1905 and since ... ... ... | L. 6,788 lb. | 92.0 | 0.2 | 7.8 | Rumex acetosa ; Centaurea nigra ... ... ... ... | 18 |
| | | L. 3,951 lb. | 88.5 | 0.0 | 11.5 | Rumex acetosa ... ... ... ... ... ... | |
| | | Unlimed ... | 87.0 | 0.0 | 13.0 | Rumex acetosa ; Centaurea nigra ... ... ... ... | |
| 19 | Farmyard Dung in 1905 and every 4th year since (omitted 1917) ... | L. 3,150 lb. | 84.8 | 1.5 | 13.7 | Ranunculus spp. ; Anthriscus sylvestris ... ... ... | 19 |
| | | L. 570 lb.... | 75.7 | 3.2 | 21.1 | Ranunculus spp. ; Rumex acetosa... ... ... ... | |
| | | Unlimed ... | 82.6 | 3.9 | 13.5 | Ranunculus spp. ; Rumex acetosa... ... ... ... | |
| 20 | Farmyard Dung in 1905 and every 4th year since (omitted in 1917), each intervening year Sulphate of Potash, Super., and Nitrate of Soda ... ... ... ... | L. 2,772 lb. | 63.3 | 4.3 | 32.4 | Ranunculus spp. ; Anthriscus sylvestris ; Taraxacum vulgare ... ... ... ... ... ... ... ... | 20 |
| | | L. 570 lb.... | 76.9 | 2.5 | 20.6 | Anthriscus sylvestris ; Rumex acetosa ... ... ... | |
| | | Unlimed ... | 68.8 | 10.4 | 20.8 | Centaurea nigra ; Anthriscus sylvestris ; Ranunculus spp. ... ... ... ... ... ... ... ... | |

# WHEAT—BROADBALK FIELD.

| Plot. | Manurial Treatment (amounts stated are per acre). | 1927 (lower part) 84th successive crop. | | | | | | | 1928 (upper part): after 2 years fallow. | | | | | | | | 77-year Average 1852–1928 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dressed Grain. | | | Offal Grain per acre. | Straw per acre. | Total† Straw per acre. | Proportion of Total Grain to 100 of Total Straw. | Dressed Grain. | | | Offal Grain per acre. | Straw per acre. | Total† Straw per acre. | Proportion of Total Grain to 100 of Total Straw. | Dressed Grain per acre. | Total Straw per acre. |
| | | Yield per acre. | Weight per bushel. | Yield per acre. | | | | | Yield per acre. | Weight per bushel. | Yield per acre. | | | | | | |
| | | bush. | lb. | cwt. | lb. | lb. | cwt. | | bush. | lb. | cwt. | lb. | lb. | cwt. | | bush. | cwt. |
| 2A | Farmyard Manure (14 tons) ... ... ... | 19.5 | 58.1 | 10.1 | 132 | 2108 | 24.0 | 47.3 | 41.1 | 64.9 | 23.8 | 75 | 5225 | 51.3 | 47.5 | 26.3** | 32.3** |
| 2B | Farmyard Manure (14 tons) ... ... ... | 24.2 | 57.9 | 12.5 | 156 | 2667 | 30.7 | 45.7 | 48.4 | 65.4 | 28.3 | 89 | 6283 | 61.4 | 47.6 | 33.2 | 34.5 |
| 3 | Unmanured since 1839 ... ... ... ... | 6.9 | 59.2 | 3.7 | 39 | 593 | 6.9 | 58.4 | 27.9 | 63.9 | 15.9 | 56 | 2730 | 27.8 | 59.4 | 11.8 | 9.9 |
| 5 | Complete Mineral Manure§§ ... ... ... | 6.5 | 59.2 | 3.4 | 28 | 590 | 6.7 | 55.6 | 35.2 | 64.5 | 20.3 | 63 | 3505 | 34.8 | 60.4 | 13.6 | 11.6 |
| 6 | As 5, and 206 lb. Sulphate of Ammonia ... ... | 12.5 | 58.6 | 6.5 | 53 | 1255 | 13.9 | 50.5 | 47.3 | 64.7 | 27.3 | 77 | 4970 | 48.7 | 58.0 | 21.7 | 20.5 |
| 7 | As 5, and 412 lb. Sulphate of Ammonia ... | 21.5 | 56.8 | 10.9 | 174 | 2730 | 30.3 | 41.4 | 67.4* | 60.6* | 36.5* | 31* | 6165* | 57.8* | 63.6* | 30.5 | 32.2 |
| 8 | As 5, and 618 lb. Sulphate of Ammonia ... | 25.9 | 54.6 | 12.6 | 193 | 3105 | 35.3 | 40.7 | 57.2 | 65.6 | 33.4 | 116 | 6105 | 62.0 | 55.6 | 34.3 | 40.0 |
| 9 | As 5, and 275 lb. Nitrate of Soda ... ... | 16.6 | 57.6 | 8.6 | 122 | 1838 | 20.7 | 46.7 | 56.1 | 61.2 | 30.6 | 40 | 5298 | 50.3 | 61.5 | 23.8†† | 24.9†† |
| 10 | 412 lb. Sulphate of Ammonia ... ... ... | 12.0 | 56.9 | 6.1 | 145 | 1358 | 16.5 | 44.8 | 47.0 | 61.6 | 25.8 | 44 | 4375 | 42.8 | 61.4 | 18.8 | 18.1 |
| 11 | As 10, and Super-phosphate (3½ cwt.) ... ... | 8.9 | 52.4 | 4.2 | 160 | 1565 | 18.8 | 29.9 | 56.9 | 61.9 | 31.4 | 62 | 5838 | 57.7 | 56.5 | 21.4 | 21.8 |
| 12 | As 10, and Super. (3½ cwt.) and Sulph. Soda (366 lb.) ... ... ... ... ... ... | 13.5 | 55.0 | 6.6 | 184 | 1895 | 22.5 | 36.7 | 57.3 | 64.5 | 33.0 | 95 | 5585 | 55.5 | 61.3 | 27.0 | 27.1 |
| 13 | As 10, and Super. (3½ cwt.) and Sulph. Potash (200 lb.) ... ... ... ... ... ... | 17.4 | 56.5 | 8.8 | 158 | 2223 | 25.2 | 40.4 | 55.2 | 65.0 | 32.0 | 98 | 5755 | 56.2 | 58.6 | 29.2 | 30.8 |
| 14 | As 10, and Super. (3½ cwt.) and Sulph. Magnesia (280 lb.) ... ... ... ... ... ... | 16.3 | 56.1 | 8.1 | 125 | 2043 | 22.8 | 40.9 | 58.6 | 63.0 | 33.0 | 67 | 5658 | 54.7 | 61.6 | 26.7 | 27.0 |
| 15 | As 5, and 412 lb. Sulphate of Ammonia, all applied in autumn ... ... ... ... ... | 11.1 | 57.0 | 5.6 | 90 | 1208 | 14.2 | 45.8 | 52.3 | 64.3 | 30.0 | 62 | 5813 | 56.6 | 54.2 | 27.6 | 28.2 |
| 16 | As 5, and 550 lb. Nitrate of Soda ... ... | 18.1 | 55.5 | 8.9 | 170 | 2330 | 26.2 | 39.7 | 56.1 | 64.6 | 32.4 | 92 | 5615 | 55.8 | 59.8 | 29.7†† | 35.3†† |
| 17 } 18 } | Minerals alone as 5 or 412 lb. Sulphate of Ammonia alone in alternate years ... ... | M6.5 A15.3 | 58.2 59.2 | 3.4 8.1 | 65 189 | 840 2280 | 9.3 26.0 | 42.3 38.3 | A51.8 M38.8 | 64.3 64.6 | 31.4 22.4 | 88 70 | 5580 3908 | 54.9 38.7 | 58.7 59.6 | A27.9 M14.1 | 28.3 12.6 |
| 19 | Rape Cake (1889 lb.) ... ... ... ... | 10.1 | 58.3 | 5.2 | 184 | 2268 | 26.3 | 26.2 | 52.7 | 64.5 | 30.4 | 94 | 5385 | 53.3 | 58.7 | 20.9‡ | 22.9‡ |
| 20 | As 7, without Super. ... ... ... ... | — | — | — | — | — | — | — | 39.3 | 64.3 | 22.5 | 76 | 4332 | 44.2 | 52.5 | 17.7§ | 20.0§ |

† Includes Straw, cavings and chaff. 1927, top portion fallowed; 1928, bottom portion fallowed. * Estimated from half plot.
** 29 years only, 1900–1928. †† 44 years only, 1885–1928. ‡ 36 years only, 1893–1928. § 19 years only, 1906–1928 (no crop in 1912, 1914, 1926 and 1927).

In 1926 and 1927 the crop was confined to the lower part of the field, the upper part being completely fallowed for 2 years. This was the first complete fallow since the experiment began in 1843. In October, 1927, the upper part was sown with wheat, and the yields for 1928 are given above.

Sulphate of Ammonia is applied as to one-third in autumn and two-thirds in spring, except for plot 15. Nitrate of Soda is all given in spring, there being two applications at an interval of a month on plot 16.

§§ Complete Mineral Manure: 3½ cwt. Super, 200 lb. Sulph. Potash, 100lb. Sulph. Soda, 100 lb. Sulph. Magnesia.

# PERMANENT BARLEY PLOTS, Hoos Field, 1927 and 1928.

## PRODUCE PER ACRE.

| Plot. | Manuring (amounts stated are per acre) | 1927. Dressed Grain. Yield per acre. bush. | 1927. Dressed Grain. Weight per bush. lb. | 1927. Dressed Grain. Yield per acre. cwt. | 1927. Offal Grain per acre. lb. | 1927. Straw per acre. lb. | 1927. Total†† Straw per acre. cwt. | 1927. Proportion of Total Grain to 100 of Total Straw. | 1928. Dressed Grain. Yield per acre. bush. | 1928. Dressed Grain. Weight per bush. lb. | 1928. Dressed Grain. Yield per acre. cwt. | 1928. Offal Grain per acre. lb. | 1928. Straw per acre. lb. | 1928. Total†† Straw per acre. cwt. | 1928. Proportion of Total Grain to 100 of Total Straw. | 76 years' Average Yield 1852–1928.† Dressed Grain per acre. bush. | 76 years' Average Yield 1852–1928.† Total†† Straw per acre. cwt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1O | Unmanured | 9.1 | 52.1 | 4.2 | 16 | 338 | 4.6 | 94.8 | 5.0 | 44.0 | 2.0 | 18 | 363 | 4.1 | 51.3 | 13.4 | 7.8 |
| 2O | Superphosphate only (3½ cwt.) | 11.9 | 49.9 | 5.3 | 27 | 506 | 7.2 | 76.5 | 11.9 | 46.0 | 4.9 | 31 | 701 | 8.1 | 63.9 | 19.0 | 9.8 |
| 3O | Alkali Salts only (200 lb. Sulphate of Potash; 100 lb. Sulphate of Soda; 100 lb. Sulphate of Magnesia) | 4.9 | 50.5 | 2.2 | 53 | 707 | 11.6 | 22.9 | 6.5 | 43.1 | 2.5 | 21 | 743 | 8.4 | 32.0 | 14.3 | 8.7 |
| 4O | Complete Minerals; as 3O with Superphosphate (3½ cwt.) | 5.3 | 50.8 | 2.4 | 139*a* | 1507 | 22.5 | 16.2 | 10.6 | 45.5 | 4.3 | 37 | 1133 | 13.1 | 35.2 | 19.0 | 11.2 |
| 5O | Potash (200 lb.) and Superphosphate (3½ cwt.) | 7.7 | 49.8 | 3.4 | 18 | 374 | 6.1 | 58.7 | 5.4 | 42.0 | 2.0 | 28 | 737 | 8.1 | 28.2 | 15.5 | 9.4 |
| 1A | Ammonium Salts only (206 lb. Sulphate of Ammonia) | 23.2 | 50.8 | 10.5 | 29 | 902 | 11.1 | 97.3 | 7.4 | 42.8 | 2.8 | 25 | 520 | 6.3 | 47.8 | 23.7 | 13.7 |
| 2A | Superphosphate and Amm. Salts | 16.2 | 49.8 | 7.2 | 40 | 723 | 9.6 | 78.9 | 11.8 | 44.3 | 4.7 | 28 | 781 | 9.3 | 52.8 | 35.8 | 20.4 |
| 3A | Alkali Salts and Amm. Salts | 17.0 | 47.8 | 7.2 | 40 | 1059 | 14.7 | 51.6 | 11.2 | 43.8 | 4.4 | 39 | 1015 | 12.2 | 38.5 | 25.8 | 16.0 |
| 4A | Complete Minerals and Amm. Salts | 21.7 | 50.9 | 9.8 | 42 | 1304 | 18.0 | 56.9 | 11.4 | 45.8 | 4.7 | 23 | 1275 | 14.7 | 33.1 | 39.3 | 23.6 |
| 5A | Potash, Super. and Amm. Salts | 21.4 | 49.0 | 9.4 | 38 | 1249 | 17.0 | 57.2 | 3.0 | 42.0 | 1.1 | 8 | 891 | 9.9 | 12.2 | 33.8 | 21.7 |
| 1AA | Nitrate of Soda only (275 lb.) | 29.6 | 51.5 | 13.6 | 44 | 1403 | 16.9 | 82.6 | 8.8 | 42.0 | 3.3 | 41 | 924 | 10.8 | 34.1 | 24.3* | 15.4* |
| 2AA | Superphosphate and Nitrate of Soda | 33.6 | 50.0 | 15.0 | 44 | 1337 | 16.0 | 96.1 | 13.8 | 44.8 | 5.5 | 28 | 1243 | 14.7 | 39.0 | 38.8* | 23.1* |
| 3AA | Alkali Salts and Nitrate of Soda | 19.2 | 51.3 | 8.8 | 43 | 1507 | 22.0 | 41.6 | 9.1 | 41.5 | 3.4 | 39 | 1337 | 14.7 | 25.4 | 24.5* | 16.6* |
| 4AA | Complete Minerals and Nitrate of Soda | 30.7 | 51.0 | 14.0 | 44 | 1540 | 20.2 | 71.1 | 11.1 | 44.5 | 4.4 | 23 | 1414 | 17.8 | 25.8 | 37.7* | 23.6* |
| 1AAS | As Plot 1AA and Silicate of Soda (400 lb.) | 31.9 | 51.4 | 14.6 | 44 | 864 | 12.0 | 125.1 | 11.0 | 43.5 | 4.3 | 34 | 1007 | 11.4 | 40.3 | 30.2* | 18.2* |
| 2AAS | As Plot 2AA and Silicate of Soda (400 lb.) | 33.8 | 50.4 | 15.2 | 49 | 1474 | 18.1 | 86.5 | 11.0 | 46.0 | 4.5 | 19 | 1018 | 12.6 | 37.2 | 39.7* | 23.9* |
| 3AAS | As Plot 3AA and Silicate of Soda (400 lb.) | 24.1 | 50.6 | 10.9 | 29 | 1067 | 14.2 | 78.9 | 8.4 | 46.0 | 3.4 | 32 | 946 | 12.1 | 30.8 | 31.2* | 19.9* |
| 4AAS | As Plot 4AA and Silicate of Soda (400 lb.) | 29.8 | 51.3 | 13.6 | 45 | 1557 | 20.4 | 68.7 | 9.7 | 46.0 | 4.0 | 20 | 1243 | 16.4 | 25.5 | 39.9* | 25.4* |
| 1C | Rape Cake only (1000 lb.) | 30.4 | 52.3 | 14.2 | 29 | 1485 | 17.9 | 80.4 | 10.1 | 42.8 | 3.8 | 23 | 1141 | 13.6 | 29.8 | 35.5 | 20.6 |
| 2C | Superphosphate and Rape Cake | 40.9 | 50.5 | 18.4 | 37 | 1672 | 20.6 | 91.2 | 12.9 | 44.7 | 5.2 | 20 | 1287 | 15.5 | 34.3 | 38.1 | 22.0 |
| 3C | Alkali Salts and Rape Cake | 21.1 | 48.5 | 9.2 | 65 | 982 | 13.6 | 71.8 | 7.0 | 43.5 | 2.7 | 20 | 908 | 11.3 | 25.7 | 33.7 | 20.4 |
| 4C | Complete Minerals and Rape Cake | 30.9 | 50.6 | 14.0 | 39 | 1526 | 19.2 | 74.5 | 9.9 | 44.0 | 3.9 | 20 | 1419 | 16.3 | 24.9 | 37.5 | 22.6 |
| 7-1 | Unmanured (after dung (14 tons) for 20 years 1852-71) | 12.9 | 50.4 | 5.8 | 31 | 636 | 9.2 | 66.1 | 7.6 | 41.5 | 3.7 | 34 | 913 | 11.1 | 27.9 | 22.5‡ | 13.5‡ |
| 7-2 | Farmyard Manure (14 tons) | 40.4 | 50.5 | 18.2 | 63 | 2004 | 28.3 | 66.5 | 8.6 | 42.0 | 5.1 | 37 | 1166 | 13.2 | 26.8 | 44.6 | 28.1 |
| 6-1 | Unmanured since 1852 | 5.2 | 50.5 | 2.4 | 20 | 266 | 4.3 | 58.7 | 7.4 | 43.0 | 2.8 | 25 | 515 | 6.2 | 49.3 | 14.7 | 8.6 |
| 6-2 | Ashes from Laboratory furnace | 8.4 | 48.8 | 3.7 | 27 | 420 | 6.8 | 57.4 | 12.0 | 44.5 | 4.8 | 33 | 704 | 8.6 | 59.0 | 15.7 | 9.3 |
| 1N | Nitrate of Soda only (275 lb.) | 25.3 | 49.4 | 11.2 | 43 | 1232 | 15.5 | 74.4 | 9.4 | 44.3 | 2.8 | 18 | 924 | 10.6 | 36.8 | 28.7§ | 17.8§ |
| 2N | Nitrate of Soda only (275 lb.) | 26.7 | 48.8 | 11.7 | 34 | 1205 | 16.1 | 74.2 | 12.7 | 44.8 | 3.2 | 28 | 2593 | 29.0 | 18.4 | 31.7§§ | 20.0§§ |

† 1912, all plots were fallowed. * 60 years, 1868-1928. ‡ 56 years, 1872-1928. § 75 years, 1853-1928. §§ 69 years, 1859-1928.
*a* A large amount of black medic seed in Offal Grain. †† Includes straw, cavings and chaff.