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The Classical Experiments

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CROPS GROWN IN ROTATION, AGDELL FIELD

PRODUCE PER ACRE

| Year | Crop | O | | M | | C | |
|------|------|----------------------|-------------------------|--------------------------------|-------------------------|---|-------------------------|
| | | Unmanured since 1848 | | Mineral Manure† No Nitrogen | | Complete Mineral and Nitrogenous Manure | |
| | | 5 Fallow | 6 Clover or Beans | 3 Fallow | 4 Clover or Beans | 1 Fallow | 2 Clover or Beans |

Average of first twenty-two Courses, 1848-1935

| | | | | | | |
|-------------------------|------|------|-------|-------|-------|-------|
| Roots (Swedes) .. cwt.* | 31.4 | 15.5 | 169.6 | 201.9 | 340.4 | 298.9 |
| Barley— | | | | | | |
| Dressed grain .. bush. | 20.8 | 19.0 | 22.1 | 26.0 | 29.1 | 33.6 |
| Total straw .. cwt.† | 13.0 | 12.8 | 13.3 | 15.4 | 18.0 | 21.3 |
| Beans— | | | | | | |
| Dressed Grain .. bush.‡ | — | 12.6 | — | 18.9 | — | 21.2 |
| Total straw .. cwt.‡ | — | 9.4 | — | 14.9 | — | 15.4 |
| Clover Hay .. cwt.§ | — | 25.6 | — | 52.1 | — | 52.0 |
| Wheat— | | | | | | |
| Dressed grain .. bush. | 22.7 | 21.3 | 26.5 | 28.8 | 26.7 | 28.3 |
| Total straw .. cwt.† | 22.8 | 21.2 | 28.5 | 29.7 | 29.4 | 29.0 |

Present Course (23rd), 1936

1936 | Roots (Turnips) .. cwt. | 24.4 9.4 | 53.8 51.0 | 112.6 65.3

* Plots 1, 3 and 5 based upon 20 courses. Plots 2, 4 and 6 based upon 19 courses.

† Includes straw, cavings and chaff.

‡ 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 Dust per acre. Manures applied once every four years, prior to sowing of Swedes.

‡‡ Based on 9 courses.

§ Based on 13 courses.

CULTIVATIONS, ETC.—Ploughed; Sept. 17-24 and March 24. Cultivated; April 17. Spring-tine harrowed; April 25 and May 2. Harrowed; May 18 and 25. Rolled; May 1, 18 and 25. Horse Hoed; June 17 and July 20. Singled; June 30-July 1. Manures applied; May 14. Seed Sown; May 25. Variety; Bruce. Lifted; Nov. 10-17.

WHEAT AFTER FALLOW—HOOS FIELD

Without Manure 1851, and since
SCHEME FOR COMPARING A THREE YEAR FALLOW WITH A ONE YEAR FALLOW

Each of the two strips on Hoos Wheat after Fallow is divided into four parts. In the year when a strip is in crop, one quarter continues to be fallowed, so that this quarter has a three-year fallow. Different quarters are selected for fallow in successive years in the rotation given in the following table ;

| A W B | | Cropping of strips A and B | | | | | | | | |
|-------|---|----------------------------|----|----|----|-----------|----|----|----|----|
| | | C=Crop. | | | | F=Fallow. | | | | |
| 1 | 1 | Year | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 |
| 2 | 2 | 1932 | F | C | C | C | F | F | F | F |
| | | 1933 | F | F | F | F | C | C | F | C |
| | | 1934 | C | F | C | C | F | F | F | F |
| | | 1935 | F | F | F | F | C | C | C | F |
| | | 1936 | C | C | F | C | F | F | F | F |
| | | 1937 | F | F | F | F | F | C | C | C |
| | | 1938 | C | C | C | F | F | F | F | F |
| | | 1939 | F | F | F | F | C | F | C | C |
| | | 1940 | F | C | C | C | F | F | F | F |
| 3 | 3 | | | | | | | | | |
| 4 | 4 | | | | | | | | | |

A comparison of the effect of a three-year fallow with the effect of a one-year fallow will be possible in every year.

Half the experiment continues to be wheat after one year fallow, and continuity with previous results will thus be maintained.

PRODUCE PER ACRE, 1936

| | | | | A1 | A2 | A4 | Mean | <i>Average 80 years, 1856-1935</i> |
|-----------------------|----|----|--|------|------|------|------|--|
| Dressed Grain—bushels | .. | .. | | 7.1 | 4.4 | 4.2 | 5.2 | 14.4 |
| Total Grain—cwt. | .. | .. | | 5.0 | 2.9 | 2.8 | 3.6 | 8.2 |
| Weight per bushel—lb. | .. | .. | | 59.6 | 60.0 | 57.4 | 59.0 | 58.9 |
| Total Straw—cwt. | .. | .. | | 10.9 | 9.3 | 8.1 | 9.4 | 12.8 |

CULTIVATIONS, ETC.—Cropped sections ; Ploughed Aug. 27. Harrowed ; Oct. 24, 26 and March 24. Rolled ; May 6. Seed Sown ; Oct. 26. Variety ; Red Standard. Harvested ; Sept. 1. Fallowed section ; Ploughed ; Aug. 27, April 1 and Aug. 24. Spring-tine Harrowed ; Feb. 14 Cultivated ; May 20 and June 29.

MANGOLDS—BARNFIELD, 1936
PRODUCE PER ACRE,
Roots each year since 1856. **Mangolds each year since 1876**

| Strip | Strip Manures (Amounts stated are per acre) | 1936 | | | | | | 54 Year Average, 1876-1935. † | | | | | | | |
|-------|--|-----------------|---------------------------|-------------------------------|-----------------------|-----------------------|-------|-------------------------------|-------------------------------|-----------------------|-----------------|---------------------------|-------------------------------|-----------------------|-----------------------|
| | | Cross Dressings | | | Cross Dressings | | | Cross Dressings | | | Cross Dressings | | | | |
| | | O | N | A | AC | C | O | N | A | AC | C | O | N | A | AC |
| | | None | Nitrate of soda (550 lb.) | Sulphate of Ammonia (412 lb.) | Rape Cake (2,000 lb.) | Rape Cake (2,000 lb.) | None | Nitrate of Soda (550 lb.) | Sulphate of Ammonia (412 lb.) | Rape Cake (2,000 lb.) | None | Nitrate of Soda (550 lb.) | Sulphate of Ammonia (412 lb.) | Rape Cake (2,000 lb.) | Rape Cake (2,000 lb.) |
| | | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons | Tons |
| 1 | Dung only (14 tons) | 16.36 | 34.96 | 33.23 | 32.76 | 27.64 | 17.59 | 26.45 | 21.80 | 23.57 | 23.59 | 26.45 | 21.80 | 23.57 | 23.59 |
| 2 | Dung, Superphosphate (3½ cwt.), Sulphate of Potash (500 lb.) | 18.59 | 39.14 | 34.36 | 29.70 | 29.75 | 19.27 | 27.13 | 34.95 | 27.72 | 26.71 | 27.13 | 34.95 | 27.72 | 26.71 |
| 4 | Complete Minerals: Super. and Potash as 2, Salt (200 lb.), Sulphate of Magnesia (200 lb.) | 6.01 | (a)28.52** (b)27.08** | 22.18 | 28.97 | 27.44 | 4.72 | (a)17.70 (b)18.72* | 14.68 | 26.22 | 21.15 | (a)17.70 (b)18.72* | 14.68 | 26.22 | 21.15 |
| 5 | Superphosphate only (3½ cwt.) | 5.50 | 24.97 | 13.80 | 17.17 | 18.07 | 4.53 | 14.96 | 6.78 | 9.31 | 10.05 | 14.96 | 6.78 | 9.31 | 10.05 |
| 6 | Super. (3½ cwt.) Sulphate of Potash (500 lb.), and Sodium Chloride (200 lb.) | 5.33 | 27.53 | 19.94 | 27.82 | 26.07 | 4.12 | 15.43 | 13.69 | 22.42 | 18.20 | 15.43 | 13.69 | 22.42 | 18.20 |
| 7 | Super. (3½ cwt.) Sulphate of Magnesia (200 lb.), and Sodium Chloride (200 lb.) | 4.95 | 28.07 | 23.73 | 32.55 | 31.14 | 4.89 | 16.43 | 14.92 | 22.07 | 19.24 | 16.43 | 14.92 | 22.07 | 19.24 |
| 8 | No Minerals | 2.82 | 18.12 | 11.50 | 18.56 | 19.25 | 3.39 | 9.88 | 5.40 | 8.40 | 8.95 | 3.39 | 9.88 | 5.40 | 8.40 |
| 9 | Sodium Chloride (200 lb.), Nit. Soda (550 lb.), Sulphate Potash (500 lb.) and Sulphate Magnesia (200 lb.) | 29.67 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 1 | Dung only (14 tons) | 5.21 | 6.27 | 6.20 | 6.07 | 5.74 | 3.06 | 4.63 | 4.87 | 5.21 | 4.57 | 3.06 | 4.63 | 4.87 | 5.21 |
| 2 | Dung, Superphosphate (3½ cwt.), Sulphate of Potash (500 lb.) | 5.18 | 6.08 | 5.92 | 6.01 | 5.71 | 3.16 | 5.14 | 5.43 | 6.20 | 4.81 | 3.16 | 5.14 | 5.43 | 6.20 |
| 4 | Complete Minerals: Super. and Potash as 2, Salt (200 lb.), Sulphate of Magnesia (200 lb.) | 1.64 | (a)4.48 (b)5.10 | 4.07 | 6.26 | 5.31 | 1.06 | (a)3.86 (b)4.09* | 2.90 | 5.27 | 3.37 | (a)3.86 (b)4.09* | 2.90 | 5.27 | 3.37 |
| 5 | Superphosphate only (3½ cwt.) | 1.47 | 3.32 | 3.77 | 5.40 | 5.16 | 1.06 | 3.20 | 2.60 | 3.24 | 2.83 | 3.20 | 2.60 | 3.24 | 2.83 |
| 6 | Super. (3½ cwt.) Sulphate of Potash (500 lb.), and Sodium Chloride (200 lb.) | 1.44 | 4.45 | 4.08 | 6.20 | 5.54 | 0.94 | 3.05 | 2.80 | 5.11 | 2.87 | 3.05 | 2.80 | 5.11 | 2.87 |
| 7 | Super. (3½ cwt.) Sulphate of Magnesia (200 lb.) and Sodium Chloride (200 lb.) | 1.39 | 4.46 | 4.95 | 7.15 | 6.54 | 1.11 | 3.34 | 3.04 | 5.18 | 3.34 | 1.11 | 3.34 | 3.04 | 5.18 |
| 8 | No Minerals | 1.12 | 4.83 | 5.87 | 5.89 | 5.86 | 0.98 | 3.20 | 2.49 | 3.25 | 2.83 | 0.98 | 3.20 | 2.49 | 3.25 |
| 9 | Sodium Chloride (200 lb.), Nit. Soda (550 lb.), Sulphate Potash (500 lb.) and Sulphate of Magnesia (200 lb.) | 5.05 | — | — | — | — | — | — | — | — | — | — | — | — | — |

** From 1904 onwards plot 4N has been divided, 4(a) receiving Superphosphate, Sulphate of Potash, Sulphate of Magnesia, Sodium Chloride and Nitrate of Soda, amounts as above; (4b) receiving Superphosphate, Calcium Chloride (190 lb.), Potassium Nitrate (570 lb.), and Calcium Nitrate (100 lb.). 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 the seed.

† Excluding 1885 when nitrogenous fertilisers were not applied, owing to poor crop, 1908 and 1927 when the crop was swedes, 1930 when the spacing of the rows was changed, 1931 when the crop was a mixture of mangolds and swedes and 1935 when it was fallow.

* 27 years only, 1904-1935, excluding 1908, 1927, 1930, 1931 and 1935. For this period the average yield of plot 4(a) was 18.88 for roots and 4.00 for leaves.

CULTIVATIONS, etc.—Ploughed (except dung plots): October 16-21. Applied dung: December 6-9. Ploughed in dung: Dec. 16-January 16. Cultivated: March 23. Spring-time harrowed: April 8 and 9. Harrowed and rolled: April 30. Horse hoed: May 27, June 17, 25, July 1, 21, 27, 28, and August 6. Hand hoed: May 29. Singled: June 17-29. Manures applied: April 29, 29, 30, and June 30. Seed sown: April 30. Variety: Yellow Globe. Lifted: October 24-November 10.

HAY—THE PARK GRASS PLOTS, 1936

| Plot | Manures since 1905 | Yield of Hay (cwt. per acre) | | | Dry Matter (cwt. per acre) | | |
|------|---|------------------------------|----------|-------|----------------------------|----------|-------|
| | | 1st Crop | 2nd Crop | Total | 1st Crop | 2nd Crop | Total |
| 1 | Sulphate of ammonia (206 lb.) | 6.5 | 12.4 | 18.9 | 15.2 | 8.0 | 23.2 |
| 2 | Unmanured | 8.1 | 4.1 | 12.2 | 9.9 | 5.7 | 15.6 |
| 3 | Unmanured | 6.5 | 3.5 | 10.0 | 7.7 | 4.1 | 11.8 |
| 4-1 | Superphosphate (3½ cwt.) | 8.0 | 4.0 | 12.0 | 8.0 | 3.3 | 11.3 |
| 4-2 | As 4-1 and sulphate of ammonia (412 lb.) | 9.1 | 8.4 | 17.5 | 28.3 | 11.7 | 40.0 |
| 5-1 | Unmanured | 7.3 | 6.5 | 13.8 | | | |
| 5-2 | Superphosphate (3½ cwt.) and sulphate of potash (500 lb.) | 20.1 | 10.5 | 30.6 | | | |
| 6 | As 5-2, and sulphate of soda (100 lb.) and sulphate of magnesia (100 lb.) | 24.1 | 9.6 | 33.7 | 35.7 | 15.6 | 51.3 |
| 7 | As 6 | 23.9 | 16.8 | 40.7 | 37.7 | 17.9 | 55.6 |
| 8 | As 6 | 13.3 | 6.9 | 20.2 | 11.3 | 6.6 | 17.9 |
| 9 | As 6 and sulphate of ammonia (412 lb.) | 38.9 | 13.6 | 52.5 | 48.8 | 16.1 | 64.9 |
| 10 | As 8 and sulphate of ammonia (412 lb.) | 24.9 | 9.7 | 34.6 | 36.6 | 11.7 | 48.3 |
| 11-1 | As 6 and sulphate of ammonia (618 lb.) | 40.8 | 15.4 | 56.2 | 52.1 | 18.3 | 70.4 |
| 11-2 | As 11-1 and silicate of soda (3½ cwt.) | 49.2 | 23.1 | 72.3 | 52.4 | 27.0 | 79.4 |
| 12 | Unmanured | 10.0 | 6.0 | 16.0 | | | |
| 13 | Dung (14 tons) in 1905, fish guano (6 cwt.) in 1907 and every fourth year | 37.0 | 19.5 | 56.5 | 32.6 | 14.3 | 46.9 |
| 14 | As 6 and nitrate of soda (550 lb.) | 55.5 | 17.2 | 72.7 | 56.6* | 7.7 | 64.3 |
| 15 | As 6 | 23.4 | 9.6 | 33.0 | 26.7 | 10.7 | 37.4 |
| 16 | As 6 and nitrate of soda (275 lb.) | 43.1 | 9.2 | 52.3 | 35.6 | 11.0 | 46.6 |
| 17 | Nitrate of soda (275 lb.) | 22.6 | 5.0 | 27.6 | 20.8 | 7.3 | 28.1 |
| 18 | As 6 (without superphosphate) and sulphate of ammonia (412 lb.) | 12.0 | 34.3 | 46.3 | 18.8† | 5.7 | 24.5 |
| 19 | Dung every fourth year | 26.6 | 12.0 | 38.6 | 25.8‡ | 10.2 | 36.0 |
| 20 | As 19 and superphosphate (200 lb.), sulphate of potash (100 lb.) and nitrate of soda (168 lb.) every intervening year | 38.4 | 12.3 | 50.7 | 33.6‡ | 9.9 | 36.1 |
| | | | | | 36.0§§ | 10.7 | 46.7 |

Ground lime was applied to the southern portion (limed) of the plots at the rate of 2,000 lb. to the acre in the winters of 1903-4, 1907-8, 1915-16, 1923-24, 1927-28, 1931-32, 1935-36 and at the rate of 2,500 lb. to the acre in the winter of 1920-21 except where otherwise stated. **The second crop was carted green; the figures given are estimated hay yields, calculated from the dry matter. *Sun. **Shade. †6788 lb. ‡3951 lb. §3150 lb. §§570 lb. ††3773 lb. CULTIVATIONS ETC.—Applied lime: Feb. 19-21. Drag harrowed: Feb. 24. Manures applied: Feb. 27, 28, April 14 and May 7. Cut 1st crop, June 24-26; 2nd crop, October 13-16. For a complete description of the manures since 1856, see the 1935 Report, p. 151.

PARK GRASS PLOTS
BOTANICAL COMPOSITION PER CENT—1936 (1st Crop)

| Plot | Manuring | Liming | Gram-ineae | Legum-inosae | Other Orders | "Other Orders" consist largely of |
|------|--|---------------|------------|--------------|--------------|--|
| 3 | Unmanured | Limed | 47.03 | 16.20 | 36.77 | { <i>Scabiosa arvensis</i> <i>Poterium sanguisorba</i> |
| | | Unlimed | 44.87 | 9.87 | 45.26 | { <i>Leontodon hispidus</i> <i>Poterium sanguisorba</i> |
| 7 | Complete Mineral Manure | Limed | 53.60 | 29.34 | 17.06 | — |
| | | Unlimed | 44.09 | 32.75 | 23.16 | <i>Centaurea nigra</i> |
| 8 | Mineral Manure (without Pot-ash) | Limed | 58.52 | 18.45 | 23.03 | { <i>Scabiosa arvensis</i> <i>Plantago lanceolata</i> |
| | | Unlimed | 43.97 | 24.56 | 31.47 | <i>Plantago lanceolata</i> |
| 9 | Complete Mineral Manure and double Amm. Salts | Limed | 96.19 | 0.06 | 3.75 | <i>Heracleum sphondylium</i> |
| | | Unlimed | 99.63 | — | 0.37 | <i>Heracleum sphondylium</i> |
| 10 | Mineral Manure (without Pot-ash) and double Amm. Salts | Limed | 99.47 | — | 0.53 | <i>Rumex acetosa</i> |
| | | Unlimed | 99.91 | 0.04 | 0.05 | <i>Rumex acetosa</i> |
| 14 | Complete Mineral Manure and double Nitrate of Soda | Limed (sun) | 91.58 | 1.69 | 6.73 | <i>Anthriscus sylvestris</i> |
| | | Limed (shade) | 94.57 | 3.14 | 2.29 | <i>Anthriscus sylvestris</i> |
| | | Unlimed | 94.65 | 0.62 | 4.73 | <i>Anthriscus sylvestris</i> |
| 18 | Mineral Manure (without Super) and double Sulphate Amm. 1905 and since. | L.6,788 lb. | 79.58 | 0.05 | 20.37 | <i>Taraxacum vulgare</i> |
| | | L.3,951 lb. | 80.93 | 0.03 | 19.04 | <i>Taraxacum vulgare</i> |
| | | Unlimed | 99.69 | — | 0.31 | — |
| 19 | Farmyard Dung in 1905 and every fourth year since (omitted 1917) | L.3,150 lb. | 88.62 | 6.18 | 5.20 | — |
| | | L.570 lb. | 78.73 | 9.90 | 11.37 | — |
| | | Unlimed | 84.09 | 5.19 | 10.72 | — |
| 20 | Farmyard Dung in 1905 and every fourth year since (omitted 1917) : each intervening year Sulphate of Potash, Super., and Nitrate of soda | L.2,772 lb. | 70.39 | 9.42 | 20.19 | — |
| | | L.570 lb. | 92.03 | 1.68 | 6.29 | — |
| | | Unlimed | 90.51 | 2.95 | 6.54 | — |

| | Unlimed (U) : Limed (L) | Plots | 3U | 3L | 7U | 7L | 8U | 8L | 9U | 9L | 10U | 10L | 14U | Sun 14L | Shade 14L |
|-----|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-----------|
| | <i>Gramineae.</i> | | | | | | | | | | | | | | |
| 1. | <i>Agrostis vulgaris</i> | .. | 14.23 | 3.54 | 6.05 | 0.53 | 7.36 | 1.58 | 0.03 | 2.46 | 4.39 | 1.87 | 0.09 | — | 0.30 |
| 3. | <i>Alopecurus pratensis</i> | .. | 1.22 | 2.53 | 0.76 | 8.40 | 0.17 | 2.14 | 0.06 | 58.18 | 0.05 | 48.65 | 47.11 | 19.73 | 21.41 |
| 4. | <i>Anthoxanthum odoratum</i> | .. | 3.27 | 0.19 | 3.75 | 0.32 | 2.77 | 0.73 | 0.03 | 4.52 | 18.99 | 3.74 | — | — | 0.18 |
| 5. | <i>Arrhenatherum avenaceum</i> | .. | 0.06 | 0.19 | 2.30 | 6.31 | 7.81 | 11.68 | 0.03 | 16.07 | 0.84 | 1.60 | 32.61 | 51.07 | 9.89 |
| 6. | <i>Avena flavescens</i> | .. | 0.58 | 4.94 | 0.90 | 2.78 | 1.81 | 5.19 | — | — | — | 0.07 | — | 0.10 | 1.39 |
| 7. | <i>Avena pubescens</i> | .. | 4.68 | 11.90 | 1.80 | 4.55 | 4.98 | 16.25 | — | — | — | — | 0.05 | 0.68 | 15.08 |
| 8. | <i>Briza media</i> | .. | 3.08 | 5.38 | 0.04 | — | 0.17 | 1.69 | — | — | — | 0.14 | 3.93 | — | 1.51 |
| 9. | <i>Bromus mollis</i> | .. | — | — | — | 0.80 | — | — | — | 0.94 | — | — | — | 0.49 | — |
| 10. | <i>Cynosurus cristatus</i> | .. | — | 0.06 | — | — | — | 0.11 | — | — | — | 0.14 | 5.30 | 4.98 | 1.69 |
| 11. | <i>Dactylis glomerata</i> | .. | 3.01 | 2.91 | 12.61 | 11.28 | 2.72 | 3.78 | — | 3.23 | — | 0.14 | 0.13 | 3.03 | 38.48 |
| 12. | <i>Festuca ovina</i> | .. | 13.01 | 7.21 | 10.01 | 2.73 | 12.11 | 6.09 | — | 2.70 | 0.62 | 31.02 | — | — | — |
| 13. | <i>Festuca pratensis</i> | .. | — | — | — | 0.37 | — | — | — | — | — | — | 0.84 | — | 0.84 |
| 14. | <i>Holcus lanatus</i> | .. | 1.60 | 2.85 | 4.11 | 1.55 | 3.17 | 2.31 | 99.49 | 3.34 | 74.98 | 0.07 | — | — | — |
| 15. | <i>Lolium perenne</i> | .. | — | — | 0.07 | — | 0.06 | 0.79 | — | — | — | — | 2.03 | 4.44 | 3.08 |
| 16. | <i>Poa pratensis</i> | .. | 0.06 | 3.86 | 1.62 | 2.25 | 0.51 | 1.86 | — | 4.75 | 0.05 | 12.01 | 2.56 | 6.79 | 0.72 |
| 17. | <i>Poa trivialis</i> | .. | 0.06 | 1.46 | 0.07 | 8.98 | 0.34 | 4.29 | — | — | — | — | — | — | — |
| | <i>Leguminosae</i> | | | | | | | | | | | | | | |
| 1. | <i>Lathyrus pratensis</i> | .. | 0.96 | 0.95 | 15.96 | 15.56 | 0.23 | 0.34 | — | 0.06 | — | — | 0.62 | 1.81 | 2.83 |
| 2. | <i>Lotus corniculatus</i> | .. | 6.73 | 10.25 | 5.29 | — | 5.38 | 5.87 | — | — | 0.04 | — | — | — | — |
| 3. | <i>Ononis arvensis</i> | .. | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 4. | <i>Trifolium pratense</i> | .. | 1.99 | 4.68 | 9.87 | 4.55 | 18.68 | 12.13 | — | — | — | — | — | — | — |
| 5. | <i>Trifolium repens</i> | .. | 0.19 | 0.32 | 0.50 | 11.28 | 0.28 | 0.06 | — | — | — | — | — | — | 0.30 |
| 6. | <i>Vicia sepium</i> | .. | — | — | 1.12 | — | — | — | — | — | — | — | — | — | — |

(continued)

| | Unlimed (U); Limed (L) Other Orders | Plots | 3U | 3L | 7U | 7L | 8U | 8L | 9U | 9L | 10U | 10L | 14U | Sun 14L | Shade 14L |
|-----|--|-------|-------|-------|------|------|------|------|------|------|------|------|------|------------|--------------|
| 1. | Ranunculus acris | .. | 0.06 | 1.20 | 0.18 | 0.53 | 0.68 | 0.68 | — | — | — | — | — | — | — |
| 2. | Ranunculus bulbosus | .. | 0.26 | 0.25 | — | 0.32 | 0.34 | 0.68 | — | — | — | — | — | — | — |
| 4. | Cerastium vulgatum | .. | 0.13 | — | 0.11 | — | 0.23 | — | — | — | — | — | — | — | — |
| 5. | Stellaria graminea | .. | — | 0.19 | — | — | — | 0.62 | — | — | — | — | — | — | — |
| 7. | Agrimonia eupatoria | .. | — | 8.80 | — | — | — | — | — | — | — | — | — | — | — |
| 11. | Poterium sanguisorba | .. | 9.10 | — | 0.72 | — | — | — | — | — | — | — | 3.27 | 6.35 | 2.17 |
| 12. | Spiraea ulmaria | .. | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 13. | Anthriscus sylvestris | .. | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 14. | Conopodium denudatum | .. | 2.50 | 0.32 | 1.84 | 0.43 | 0.74 | 0.06 | — | — | — | — | — | — | — |
| 15. | Heracleum sphondylium | .. | — | — | 3.93 | 5.56 | — | — | 0.37 | 3.46 | — | — | — | — | — |
| 16. | Pimpinella saxifraga | .. | 0.96 | 0.82 | — | 0.05 | 0.51 | 0.45 | — | — | — | — | — | — | — |
| 17. | Galium verum | .. | 0.58 | — | — | — | 0.68 | 0.23 | — | — | — | — | — | — | — |
| 18. | Scabiosa arvensis | .. | 4.55 | 10.38 | 0.25 | — | 4.53 | 8.41 | — | — | — | — | — | — | — |
| 19. | Achillea millefolium | .. | 2.18 | 0.76 | 2.70 | 0.86 | 3.28 | 1.30 | — | — | — | — | — | — | 0.06 |
| 20. | Centaurea nigra | .. | 2.95 | 3.23 | 7.71 | 4.44 | 5.43 | 2.88 | — | — | — | — | — | — | — |
| 22. | Hieraceum pilosella | .. | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 24. | Leontodon hispidus | .. | 13.59 | 4.24 | — | 0.05 | 3.45 | 0.90 | — | — | — | — | — | — | — |
| 25. | Senecio jacobaea | .. | — | — | — | — | — | — | — | — | — | — | 0.27 | 0.15 | — |
| 26. | Taraxacum vulgare | .. | 0.13 | 0.06 | 0.07 | 0.70 | 0.17 | — | — | 0.12 | — | — | — | — | — |
| 27. | Tragopogon pratensis | .. | 0.32 | — | — | 2.46 | — | — | — | — | — | — | — | — | — |
| 29. | Plantago lanceolata | .. | 5.83 | 4.87 | 3.17 | 1.07 | 8.77 | 5.47 | — | — | — | — | — | — | — |
| 30. | Veronica chamaedrys | .. | 0.26 | 0.57 | 0.04 | 0.70 | 0.40 | 0.62 | — | — | — | — | — | — | — |
| 32. | Prunella vulgaris | .. | 0.13 | — | — | — | 0.11 | 0.06 | — | — | — | — | — | — | — |
| 33. | Thymus serpyllum | .. | 0.32 | — | — | — | — | — | — | — | — | — | — | — | — |
| 34. | Rumex acetosa | .. | 0.26 | 0.57 | 1.98 | 0.59 | 1.25 | 0.45 | — | 0.18 | 0.04 | 0.69 | 1.19 | 0.39 | 0.06 |
| 35. | Luzula campestris | .. | 0.64 | 0.44 | 0.47 | — | 0.62 | 0.23 | — | — | — | — | — | — | — |
| 36. | Carex praecox | .. | 0.51 | 0.06 | — | — | — | — | — | — | — | — | — | — | — |

WHEAT—BROADBALK FIELD, 1936

| Plot. | Manurial Treatment (amounts stated are per acre). | Dressed Grain, bushels per acre (in some cases estimated from half or quarter-bushel). | | | | | Total Grain, cwt. per acre. | | | | | 74-year Average (prior to fallow). Total Grain, cwt. |
|-------|---|--|---------------------------|------|------|------|-----------------------------|------|------|-----|------|--|
| | | II | III | IV | V | Mean | II | III | IV | V | Mean | |
| | | 2A | Farmyard Manure (14 tons) | 11.0 | 12.4 | 11.9 | 7.3 | 10.6 | 7.0 | 8.1 | 7.5 | |
| 2B | Farmyard Manure (14 tons) | 16.0 | 13.3 | 10.9 | 9.2 | 12.4 | 9.9 | 8.6 | 7.2 | 6.1 | 8.0 | 19.4 |
| 3 | Unmanured since 1839 | 8.5 | 8.0 | 7.2 | 5.8 | 7.4 | 6.2 | 5.7 | 4.9 | 4.4 | 5.3 | 6.7 |
| 5 | Complete Mineral Manure§§ | 8.0 | 14.7 | 7.5 | 9.8 | 10.0 | 6.1 | 9.8 | 5.5 | 6.6 | 7.0 | 7.8 |
| 6 | As 5, and 206 lb. Sulphate of Ammonia | 12.0 | 19.5 | 10.9 | 8.7 | 12.8 | 8.3 | 11.4 | 7.2 | 6.3 | 8.3 | 12.5 |
| 7 | As 5, and 412 lb. Sulphate of Ammonia | 16.6 | 19.4 | 14.6 | 8.9 | 14.9 | 9.7 | 11.8 | 9.2 | 6.1 | 9.2 | 17.6 |
| 8 | As 5, and 618 lb. Sulphate of Ammonia | 21.9 | 20.0 | 21.4 | 10.2 | 18.4 | 12.0 | 12.1 | 13.0 | 7.0 | 11.0 | 20.1 |
| 9 | As 5, and 275 lb. Nitrate of Soda | 14.5 | 17.4 | 13.5 | 9.6 | 13.8 | 8.3 | 10.7 | 8.4 | 6.1 | 8.4 | 13.9†† |
| 10 | 412 lb. Sulphate of Ammonia | 13.7 | 4.5 | 15.9 | 9.7 | 11.0 | 8.1 | 3.7 | 9.9 | 6.6 | 7.1 | 10.9 |
| 11 | As 10, and Superphosphate (3½ cwt.) | 7.1 | 5.8 | 5.3 | 7.5 | 6.4 | 4.7 | 4.5 | 3.9 | 5.2 | 4.6 | 12.3 |
| 12 | As 10, and Super. (3½ cwt.) and Sulph. Soda (366 lb.) | 12.1 | 8.4 | 11.5 | 5.2 | 9.3 | 7.2 | 6.1 | 7.4 | 4.1 | 6.2 | 15.7 |
| 13 | As 10, and Super. (3½ cwt.) and Sulph. Potash (200 lb.) | 21.1 | 16.7 | 17.0 | 9.4 | 16.0 | 12.2 | 10.2 | 10.3 | 6.4 | 9.8 | 17.0 |
| 14 | As 10, and Super. (3½ cwt.) and Sulph. Magnesia (280 lb.) | 13.1 | 6.8 | 20.0 | 9.2 | 12.3 | 8.2 | 5.4 | 12.1 | 6.5 | 8.0 | 15.5 |
| 15 | As 5, and 412 lb. Sulphate Amm. all applied in Autumn | 22.4 | 20.4 | 18.9 | 14.3 | 19.0 | 13.4 | 12.3 | 10.9 | 8.9 | 11.4 | 16.1 |
| 16 | As 5, and 550 lb. Nitrate of Soda | 22.4 | 14.8 | 21.0 | 12.2 | 17.6 | 12.9 | 9.1 | 13.0 | 7.7 | 10.7 | 17.8†† |
| 17 | Minerals alone as 5 or 412 lb. Sulphate of Ammonia | A23.9 | 10.5 | 18.8 | 15.5 | 17.2 | 14.1 | 6.9 | 11.4 | 9.4 | 10.4 | A16.1* |
| 18 | alone in alternate years | M 8.7 | 12.6 | 14.8 | 8.4 | 11.1 | 6.5 | 8.0 | 8.8 | 5.4 | 7.2 | M 8.1 |
| 19 | Rape Cake (1,889 lb.) | 18.7 | 17.6 | 15.3 | 12.9 | 16.1 | 10.7 | 10.7 | 8.8 | 8.1 | 9.6 | 12.6† |
| 20 | As 7, without Super. | 11.7 | — | — | — | 11.7 | 7.4 | — | — | — | 7.4 | 10.3§ |

| Season | FALLOWING ROTATION. | | | | |
|---------|---------------------|-----|------|-----|----|
| | I. | II. | III. | IV. | V. |
| 1925-26 | F | F | F | C | C |
| 1926-27 | F | F | F | C | C |
| 1927-28 | C | C | F | F | F |
| 1928-29 | C | C | F | F | F |
| 1929-30 | C | C | C | C | C |

| Season | FOLLOWING ROTATION. | | | | |
|------------------|---------------------|-----|------|-----|----|
| | I. | II. | III. | IV. | V. |
| 1930-31 and 5-6 | F | C | C | C | C |
| 1931-32 and 6-7 | C | F | C | C | C |
| 1932-33 and 7-8 | C | C | C | C | F |
| 1933-34 and 8-9 | C | C | C | F | C |
| 1934-35 and 9-40 | C | C | C | F | C |

FOLLOWING ROTATION. After the fallows of 1925-6 to 1928-9 a regular cycle of fallowing was started in the season 1930-31. This cycle and the preceding fallows are shown in the accompanying diagram (C=crop, F=fallow). The sections (I to V) are numbered in order from the upper or western end of the field. Preparatory to the first fallow the field was harvested in five separate sections (1924-5).

For notes, see next page.

WHEAT—BROADBALK FIELD, 1936

| Plot. | Manurial Treatment (amounts stated are per acre). | Bushel Weight in lb. (in some cases estimated from half or quarter-bushel). | | | | | Total Straw†, cwt. per acre. | | | | | 7 4-year Average 1852-1925 (prior to fall-low). Total Straw, cwt. |
|-------|---|---|------|------|------|------|------------------------------|------|------|------|------|---|
| | | Mean | | | | | Mean | | | | | |
| | | II | III | IV | V | Mean | II | III | IV | V | Mean | |
| 2A | Farmyard Manure (14 tons) | 61.4 | 60.4 | 60.6 | 61.2 | 60.9 | 37.8 | 49.7 | 36.5 | 34.8 | 39.7 | 32.1** |
| 2B | Farmyard Manure (14 tons) | 61.2 | 60.8 | 62.0 | 61.2 | 61.3 | 40.6 | 48.4 | 39.5 | 43.2 | 42.9 | 34.2 |
| 3 | Unmanured since 1839 | 61.0 | 58.8 | 60.2 | 60.6 | 60.2 | 18.9 | 25.2 | 13.1 | 17.7 | 18.7 | 9.8 |
| 5 | Complete Mineral Manure§§ | 62.0 | 60.4 | 60.2 | 60.8 | 60.8 | 29.2 | 30.7 | 18.8 | 16.0 | 23.7 | 11.5 |
| 6 | As 5, and 206 lb. Sulphate of Ammonia | 60.0 | 58.2 | 60.6 | 59.4 | 59.6 | 26.7 | 29.2 | 21.8 | 23.0 | 25.2 | 20.3 |
| 7 | As 5, and 412 lb. Sulphate of Ammonia | 58.4 | 58.5 | 59.5 | 57.8 | 58.6 | 26.7 | 37.8 | 29.0 | 25.7 | 29.8 | 32.1 |
| 8 | As 5, and 618 lb. Sulphate of Ammonia | 55.3 | 57.0 | 56.4 | 56.2 | 56.2 | 41.5 | 43.7 | 45.5 | 39.8 | 42.6 | 39.8 |
| 9 | As 5, and 275 lb. Nitrate of Soda | 56.7 | 57.3 | 59.3 | 58.4 | 57.9 | 26.0 | 34.2 | 23.4 | 21.5 | 26.3 | 24.6†† |
| 10 | 412 lb. Sulphate of Ammonia | 57.4 | 52.0 | 58.6 | 56.6 | 56.2 | 20.7 | 27.0 | 27.2 | 21.3 | 24.0 | 17.8 |
| 11 | As 10, and Superphosphate (3½ cwt.) | 57.6 | 54.8 | 59.6 | 57.8 | 57.4 | 14.9 | 28.3 | 20.4 | 18.4 | 20.5 | 21.4 |
| 12 | As 10, and Super. (3½ cwt.) and Sulph. Soda (366 lb.) | 56.5 | 54.8 | 57.2 | 56.4 | 56.2 | 21.4 | 31.8 | 26.0 | 20.9 | 25.0 | 26.8 |
| 13 | As 10, and Super. (3½ cwt.) and Sulph. Potash (200 lb.) | 58.9 | 57.6 | 58.0 | 58.2 | 58.2 | 28.5 | 38.0 | 30.2 | 26.4 | 30.8 | 30.6 |
| 14 | As 10, and Super. (3½ cwt.) and Sulph. Magnesia (280 lb.) | 56.3 | 56.4 | 57.9 | 57.6 | 57.0 | 22.2 | 32.8 | 33.0 | 27.4 | 28.8 | 26.8 |
| 15 | As 5, and 412 lb. Sulphate Amm. all applied in Autumn | 59.5 | 59.0 | 58.4 | 58.5 | 58.8 | 34.5 | 36.5 | 27.4 | 25.9 | 31.1 | 28.2 |
| 16 | As 5, and 550 lb. Nitrate of Soda | 57.2 | 57.3 | 58.3 | 57.8 | 57.6 | 37.4 | 43.7 | 42.2 | 37.2 | 40.1 | 35.2†† |
| 17 | Minerals alone as 5 or 412 lb. Sulphate of Ammonia | A 59.3 | 55.6 | 58.5 | 59.0 | 58.1 | 34.1 | 33.8 | 31.6 | 31.4 | 32.7 | A 28.1* |
| 18 | alone in alternate years | M 57.8 | 57.6 | 59.4 | 58.8 | 58.4 | 22.9 | 29.5 | 17.8 | 14.4 | 21.2 | M 12.3 |
| 19 | Rape Cake (1,889 lb.) | 56.9 | 58.4 | 58.5 | 58.5 | 58.1 | 22.9 | 32.8 | 28.6 | 19.0 | 25.8 | 22.0† |
| 20 | As 7, without Super. | 57.0 | — | — | — | 57.0 | 30.9 | — | — | — | 30.9 | 18.6§ |

† Includes straw, cavings, and chaff. * A = Ammonia series. M = Mineral series.
 ** Twenty-six years only, 1900-25. †† Forty-one years only, 1885-1925. † Thirty-three years only, 1893-1925. § Eighteen years only, 1906-1925 (no crop in 1912 and 1914).
 §§ Complete mineral manure; 3½ cwt. Super., 200 lb. Sulph. Potash, 100 lb. Sulph. Soda, 100 lb. Sulph. Magnesia. 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.
 CULTIVATIONS, ETC.—Cropped sections; Ploughed; Aug. 19-22 and Oct. 2-14. Dung applied; Oct. 7-8. Harrowed; Sept. 26-27, Oct. 31, Nov. 7, 27, March 20, April 6 and May 6. Spring-time harrowed; Oct. 26 and Nov. 27. Rolled; Oct. 30 and May 6. Manures applied; Oct. 28, 29, Nov. 6, April 15 and May 6. Seed sown; Nov. 6-27. Variety; Red Standard. Harvested; Aug. 21-22. Followed section; Ploughed; Aug. 19-22, Oct. 2-14, April 15 and July 22. Harrowed; Sept. 26, 27, Oct. 31 and Aug. 10. Spring-time harrowed; Oct. 26. Cultivated; May 30, June 29 and Aug. 10.

BARLEY—HOOS FIELD, 1936

| Plot | Manuring (amounts stated are per acre). | Dressed Grain bushels per acre | | Total Grain cwt. per acre | Bushel weight in lb. | Total Straw cwt. per acre† | |
|------|--|--------------------------------|-------------------|---------------------------|----------------------|----------------------------|-------------------|
| | | 1936 | Average 1852-1928 | | | 1936 | Average 1852-1928 |
| 10 | Unmanured | 10.4 | 13.4 | 5.9 | 51.0 | 12.4 | 7.8 |
| 20 | Superphosphate only (3½ cwt.) .. | 16.8 | 19.0 | 9.0 | 53.6 | 13.5 | 9.8 |
| 30 | Alkali Salts only (200 lb. Sulphate of Potash : 100 lb. Sulphate of Soda : 100 lb. Sulphate of Magnesia) | 16.5 | 14.3 | 8.6 | 52.1 | 14.6 | 8.7 |
| 40 | Complete Minerals : as 30 with Superphosphate (3½ cwt.) .. | 25.9 | 19.0 | 13.6 | 54.0 | 19.0 | 11.2 |
| 50 | Potash (200 lb.) and Superphosphate (3½ cwt.) | 22.9 | 15.5 | 11.8 | 53.8 | 13.8 | 9.4 |
| 1A | Ammonium Salts only (206 lb. Sulphate of Ammonia) | 20.1 | 23.7 | 9.5 | 47.0 | 16.9 | 13.7 |
| 2A | Superphosphate and Amm. Salts .. | 43.7 | 35.8 | 21.3 | 52.8 | 21.9 | 20.4 |
| 3A | Alkali Salts and Amm. Salts .. | 35.1 | 25.8 | 16.2 | 49.4 | 22.7 | 16.0 |
| 4A | Complete Minerals and Amm. Salts | 47.7 | 39.3 | 23.3 | 53.4 | 26.5 | 23.6 |
| 5A | Potash, Super. and Amm. Salts .. | 43.0 | 33.8 | 21.9 | 51.5 | 32.5 | 21.7 |
| 1AA | Nitrate of Soda only (275 lb.) .. | 25.4 | 24.3* | 12.8 | 49.6 | 22.5 | 15.4* |
| 2AA | Superphosphate and Nitrate of Soda | 51.4 | 38.8* | 25.1 | 53.2 | 30.5 | 23.1* |
| 3AA | Alkali Salts and Nitrate of Soda .. | 39.7 | 24.5* | 18.5 | 49.2 | 24.9 | 16.6* |
| 4AA | Complete Minerals and Nitrate of Soda | 47.2 | 37.7* | 23.5 | 54.1 | 27.5 | 23.6* |
| 1AAS | As Plot 1AA and Silicate of Soda (400 lb.) | 40.2 | 30.2* | 19.2 | 50.8 | 24.4 | 18.2* |
| 2AAS | As Plot 2AA and Silicate of Soda (400 lb.) | 45.5 | 39.7* | 22.6 | 54.2 | 27.9 | 23.9* |
| 3AAS | As Plot 3AA and Silicate of Soda (400 lb.) | 44.5 | 31.2* | 20.9 | 50.6 | 26.9 | 19.9* |
| 4AAS | As Plot 4AA and Silicate of Soda (400 lb.) | 49.3 | 39.9* | 24.9 | 54.9 | 29.6 | 25.4* |
| 1C | Rape Cake only (1,000 lb.) .. | 42.6 | 35.5 | 20.3 | 51.7 | 25.0 | 20.6 |
| 2C | Superphosphate and Rape Cake .. | 51.5 | 38.1 | 25.0 | 53.3 | 25.8 | 22.0 |
| 3C | Alkali Salts and Rape Cake .. | 46.0 | 33.7 | 22.0 | 52.0 | 26.4 | 20.4 |
| 4C | Complete Minerals and Rape Cake | 53.0 | 37.5 | 26.0 | 53.8 | 28.1 | 22.6 |
| 7-1 | Dung (14 tons) 1852-71 : afterwards unmanured | 25.4 | 22.5‡ | 12.8 | 53.6 | 18.9 | 13.5‡ |
| 7-2 | Farmyard Manure (14 tons) .. | 56.2 | 44.6 | 28.1 | 53.1 | 42.2 | 28.1 |
| 6-1 | Unmanured since 1852 | 14.9 | 14.7 | 7.5 | 49.6 | 11.9 | 8.6 |
| 6-2 | Ashes from Laboratory furnace 1852-1933 : afterwards unmanured | 14.5 | 15.7 | 7.3 | 49.4 | 12.2 | 9.3 |
| 1N | Nitrate of Soda only (275 lb.) .. | 30.2 | 28.7§ | 14.7 | 50.0 | 22.5 | 17.8§ |
| 2N | Nitrate of Soda only (275 lb.) .. | 46.1 | 31.7§§ | 22.4 | 51.5 | 27.8 | 20.0§§ |

|| 1 cwt. = 2.15 bushels. 1912 and 1933 all plots were fallowed.

† Total straw includes straw, cavings and chaff.

* 60 years, 1868-1928. ‡ 56 years, 1872-1928. § 75 years, 1853-1928. §§ 69 years, 1859-1928.

CULTIVATIONS, ETC.—Shallow ploughed ; Aug. 28-29. Ploughed ; Jan. 20-24. Ploughed in dung ; Jan. 20-24. Spring-tine harrowed ; March 16. Harrowed ; March 17. Rolled ; April 26. Hand hoed ; June 10-11. Manures applied ; March 11-12. Seed sown ; March 17. Variety : Plumage Archer. Harvested ; Aug. 17.