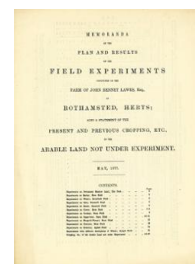


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ROTHAMSTED
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Memoranda of the Field Experiments at Rothamsted: May 1877



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Experiments on Rotation; Agdell Field

Rothamsted Research

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AGDELL FIELD.

EXPERIMENTS ON AN ACTUAL COURSE OF ROTATION—TURNIPS, BARLEY, LEGUMINOUS CROP (OR FALLOW), AND WHEAT.

These Experiments were commenced in 1848; so that the present crop (1877) is the 30th experimental one, or the second crop of the Eighth Course. One-third of the land has been continuously unmanured; one-third manured with Superphosphate of Lime alone once every four years, that is for the turnip-crop commencing each course; and one-third manured (also for the turnip-crop only) with a complex manure, as described in the foot-note, No. 2.

In the Second, Third, and Fourth Courses, clover was sown, but failed; and in them, and in the Fifth and Sixth Courses, beans were taken instead, on half of each plot, and the other half left fallow; for the third crop of the Seventh Course clover was again sown (spring 1873), on half of each plot, the other half being left fallow.

From half of each of the three plots the whole turnip-crop (roots and leaves) was removed; and on the other half the roots were eaten on the land by sheep, and the uneaten leaves spread and ploughed in. In the case of all the other crops, the total produce was removed from the land.

The abstract of the results given below relates to the portions of each plot from which the turnip-crops were entirely removed; and on which, in the second, third, fourth, fifth, and sixth courses, beans (not fallow) replaced the clover.

(Area under experiment, about 2½ acres.)

1 lb. (pound avoird.) per acre .. = (about) 1.12 Kilogramme per Hectare, or 0.57 Zollverein Pfund. per Prussian Morgen.
 1 cwt. (hundredweight) per acre = (about) 125.5 Kilogrammes per Hectare, or 0.64 Centner per Pr. Morgen.

| Years. | Description of Crop. | PRODUCE PER ACRE. | | | | | | | | |
|----------------------|----------------------------------|------------------------------------|---------------------|--------------------------------|--|---------------------|--------------------------------|---|---------------------|--------------------------------|
| | | PLOT 1. Unmanured continuously. | | | PLOT 2. Superphosphate of Lime, ¹ alone, for the Turnip Crops only. | | | PLOT 3. Complex Manure, ² for the Turnip Crops only. | | |
| | | Corn ³ (or Roots). | Straw (or Leaf). | Total Produce. ⁴ | Corn ³ (or Roots). | Straw (or Leaf). | Total Produce. ⁴ | Corn ³ (or Roots). | Straw (or Leaf). | Total Produce. ⁴ |
| 1ST COURSE, 1848-51. | | | | | | | | | | |
| 1848 | Norfolk White Turnips | 6½ cwt. | 45½ cwt. | 111½ cwt. | 22½ cwt. | 106½ cwt. | 332 cwt. | 218 cwt. | 151½ cwt. | 369½ cwt. |
| 1849 | Barley | 4½ bush. | 2983 lbs. | 5656 lbs. | 29½ bush. | 2111 lbs. | 3841 lbs. | 28½ bush. | 2083 lbs. | 3734 lbs. |
| 1850 | Clover (calcd. as hay) | .. | .. | 54 cwt. | .. | .. | 57½ cwt. | .. | .. | 63 cwt. |
| 1851 | Wheat | 28½ bush. | 3431 lbs. | 5389 lbs. | 23 bush. | 3371 lbs. | 5253 lbs. | 28½ bush. | 3552 lbs. | 5500 lbs. |
| 2ND COURSE, 1852-55. | | | | | | | | | | |
| 1852 | Swedish Turnips | 26 cwt. | 4½ cwt. | 30½ cwt. | 22¾ cwt. | 20½ cwt. | 243½ cwt. | 39½ cwt. | 36½ cwt. | 433 cwt. |
| 1853 | Barley | 3½ bush. | 2430 lbs. | 4465 lbs. | 29½ bush. | 1873 lbs. | 3560 lbs. | 38½ bush. | 2694 lbs. | 4373 lbs. |
| 1854 | Beans | 5½ bush. | 1055 lbs. | 1445 lbs. | 5½ bush. | 1103 lbs. | 1534 lbs. | 9½ bush. | 1355 lbs. | 2065 lbs. |
| 1855 | Wheat | 35½ bush. | 3619 lbs. | 5839 lbs. | 35½ bush. | 3325 lbs. | 5789 lbs. | 37½ bush. | 3942 lbs. | 6371 lbs. |
| 3RD COURSE, 1856-59. | | | | | | | | | | |
| 1856 | Swedish Turnips | 32 cwt. | 2½ cwt. | 34½ cwt. | 136 cwt. | 7½ cwt. | 14½ cwt. | 33¾ cwt. | 12½ cwt. | 346½ cwt. |
| 1857 | Barley | 38½ bush. | 2600 lbs. | 5337 lbs. | 24½ bush. | 1475 lbs. | 3076 lbs. | 48 bush. | 2455 lbs. | 5165 lbs. |
| 1858 | Beans | 6½ bush. | 1100 lbs. | 1515 lbs. | 6½ bush. | 1155 lbs. | 1605 lbs. | 14½ bush. | 1520 lbs. | 2357 lbs. |
| 1859 | Wheat | 35½ bush. | 4030 lbs. | 6202 lbs. | 34½ bush. | 3930 lbs. | 6120 lbs. | 32½ bush. | 4610 lbs. | 7154 lbs. |
| 4TH COURSE, 1860-63. | | | | | | | | | | |
| 1860 | Swedish Turnips | 1 cwt. | (6½ lbs.) | 1 cwt. | 2½ cwt. | 1½ cwt. | 30½ cwt. | 57½ cwt. | 3½ cwt. | 90½ cwt. |
| 1861 | Barley | 38½ bush. | 2522 lbs. | 4718 lbs. | 30½ bush. | 2000 lbs. | 3775 lbs. | 60½ bush. | 3940 lbs. | 7391 lbs. |
| 1862 | Beans | 29 bush. | 1840 lbs. | 3651 lbs. | 23½ bush. | 2150 lbs. | 4040 lbs. | 43½ bush. | 3250 lbs. | 5990 lbs. |
| 1863 | Wheat | 44½ bush. | 3467 lbs. | 6350 lbs. | 34½ bush. | 3390 lbs. | 5619 lbs. | 46½ bush. | 4697 lbs. | 7626 lbs. |
| 5TH COURSE, 1864-67. | | | | | | | | | | |
| 1864 | Swedish Turnips | 8½ cwt. | 0½ cwt. | 9½ cwt. | 63 cwt. | 4½ cwt. | 72½ cwt. | 176½ cwt. | 8½ cwt. | 185 cwt. |
| 1865 | Barley | 29 bush. | 2154 lbs. | 4182 lbs. | 33½ bush. | 1615 lbs. | 3394 lbs. | 47½ bush. | 2595 lbs. | 5143 lbs. |
| 1866 | Beans | 10½ bush. | 1013 lbs. | 1699 lbs. | 7½ bush. | 978 lbs. | 1463 lbs. | 20½ bush. | 1990 lbs. | 3343 lbs. |
| 1867 | Wheat | 21 bush. | 2143 lbs. | 3473 lbs. | 19½ bush. | 1966 lbs. | 3222 lbs. | 23½ bush. | 3003 lbs. | 4567 lbs. |
| 6TH COURSE, 1868-71. | | | | | | | | | | |
| 1868 | Swedish Turnips | Failed, and ploughed up. | | | Failed, and ploughed up. | | | Failed, and ploughed up. | | |
| 1869 | Barley | 24½ bush. | 1948 lbs. | 3358 lbs. | 28½ bush. | 2035 lbs. | 3686 lbs. | 42½ bush. | 3309 lbs. | 5800 lbs. |
| 1870 | Beans | 13½ bush. | 738 lbs. | 1391 lbs. | 15½ bush. | 763 lbs. | 1773 lbs. | 24½ bush. | 1056 lbs. | 2664 lbs. |
| 1871 | Wheat | 20½ bush. | 2799 lbs. | 4092 lbs. | 22½ bush. | 3048 lbs. | 4521 lbs. | 23 bush. | 3440 lbs. | 4883 lbs. |
| 7TH COURSE, 1872-75. | | | | | | | | | | |
| 1872 | Swedish Turnips | 34½ cwt. | 8½ cwt. | 42½ cwt. | 170½ cwt. | 17½ cwt. | 188 cwt. | 339½ cwt. | 35½ cwt. | 375½ cwt. |
| 1873 | Barley | 23½ bush. | 1343 lbs. | 2717 lbs. | 20½ bush. | 1565 lbs. | 2875 lbs. | 31½ bush. | 1723 lbs. | 3373 lbs. |
| 1874 | Clover | .. | .. | 31½ cwt. | .. | .. | 82 cwt. | .. | .. | 84 cwt. |
| 1875 | Wheat | 21½ bush. | 2430 lbs. | 3784 lbs. | 23½ bush. | 3536 lbs. | 5328 lbs. | 31½ bush. | 4635 lbs. | 6899 lbs. |
| 8TH COURSE, 1876-79. | | | | | | | | | | |
| 1876 | Swedish Turnips | 17½ cwt. | 5 cwt. | 22½ cwt. | 182½ cwt. | 28½ cwt. | 216½ cwt. | 356 cwt. | 55½ cwt. | 411½ cwt. |
| 1877 | Barley | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 1878 | Beans | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 1879 | Wheat | .. | .. | .. | .. | .. | .. | .. | .. | .. |

SUMMARY—AVERAGE OF THE FIRST 7 COURSES, 1848-1875.

| | | | | | | | | | | |
|------------------------------------|---|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1848, '52, '56, '60, '64, '72 | } Swedish Turnips | 27½ cwt. | 10½ cwt. | 38½ cwt. | 142½ cwt. | 26½ cwt. | 168½ cwt. | 258½ cwt. | 41½ cwt. | 300 cwt. |
| 1849, '53, '57, '61, '65, '69, '73 | | } Barley | 56½ bush. | 2233 lbs. | 4343 lbs. | 28½ bush. | 1809 lbs. | 3438 lbs. | 42½ bush. | 2671 lbs. |
| 1850, '54, '58, '62, '66, '70, '74 | } Clover, 1850 and '74 (calcd. as hay) | .. | .. | 42½ cwt. | .. | .. | 55 cwt. | .. | .. | 73½ cwt. |
| 1851, '55, '59, '63, '67, '71, '75 | | } Beans | 12½ bush. | 1149 lbs. | 1980 lbs. | 13 bush. | 1231 lbs. | 2084 lbs. | 22½ bush. | 1840 lbs. |
| | } Wheat | 30 bush. | 3131 lbs. | 5030 lbs. | 29½ bush. | 3252 lbs. | 5122 lbs. | 33 bush. | 3990 lbs. | 6114 lbs. |

(1) First Course—100 lbs. Bone-ash, and 100 lbs. Sulphuric Acid (sp. gr. 1.7); Second Course—160 lbs. Bone-ash, 120 lbs. Sulphuric Acid; Third, Fourth, Fifth, Sixth, and Seventh Courses—200 lbs. Bone-ash, and 150 lbs. Sulphuric Acid, per acre.
 (2) First Course—100 lbs. Pearl-ash, 100 lbs. Bone-ash, 100 lbs. Sulphuric Acid, 100 lbs. Sulphate of Ammonia, 100 lbs. Muriate of Ammonia, and 1000 lbs. Rape-Cake; Second Course—300 lbs. Sulphate of Potass, 100 lbs. Sulphate of Soda, 100 lbs. Sulphate of Magnesia, 160 lbs. Bone-ash, 120 lbs. Sulphuric Acid, 100 lbs. Sulphate of Ammonia, 100 lbs. Muriate of Ammonia, and 2000 lbs. Rape-cake, per acre.
 (3) The quantities given in *brackets* represent the *Dressed* Corn only.
 (4) The "Total Produce" of the Corn-crops includes Dressed Corn, Ofal Corn, and Total Straw.