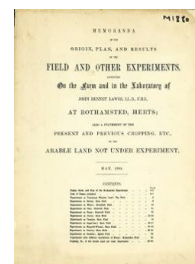


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ROTHAMSTED
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Memoranda of the Field Experiments at Rothamsted: May 1880



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Experiments on Rotation; Agdell Field

Rothamsted Research

Rothamsted Research (1881) *Experiments on Rotation; Agdell Field* ; Memoranda Of The Field Experiments At Rothamsted: May 1880, pp 22 - 22 - DOI:
<https://doi.org/10.23637/ERADOC-1-244>

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 (1880) is the 33rd experimental one, or the first crop of the Ninth 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, and gave three cuttings; the other half of each being left fallow. In the eighth course beans were again grown. 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, sixth, and eighth 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, alone, for the Turnip Crops only. | | | Plot 3. Complex Manure, 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 | 65½ cwt. | 45½ cwt. | 111½ cwt. | 225½ cwt. | 106½ cwt. | 332 | 218 | 151½ | 369½ |
| 1849 | Barley | 44½ bush. | 2963 lbs. | 5656 lbs. | 29½ bush. | 2111 lbs. | 3841 lbs. | 2083 lbs. | 3794 lbs. | 63 cwt. |
| 1850 | Clover (calc. as hay) | 28½ bush. | 3431 lbs. | 5389 lbs. | 28 | 3371 lbs. | 573 cwt. | 28½ bush. | 3592 lbs. | 5500 lbs. |
| 1851 | Wheat | | | | | | | | | |
| 2ND COURSE, 1852-55. | | | | | | | | | | |
| 1852 | Swedish Turnips | 26 cwt. | 44 cwt. | 30½ cwt. | 223½ cwt. | 20½ cwt. | 243½ cwt. | 396½ cwt. | 36½ cwt. | 433 cwt. |
| 1853 | Barley | 34½ bush. | 2430 lbs. | 4465 lbs. | 28½ bush. | 1873 lbs. | 3976 lbs. | 32½ bush. | 2604 lbs. | 4973 lbs. |
| 1854 | Beans | 5½ bush. | 1055 lbs. | 1445 lbs. | 5½ bush. | 1103 lbs. | 1534 lbs. | 9½ bush. | 1355 lbs. | 2065 lbs. |
| 1855 | Wheat | 33½ bush. | 3619 lbs. | 3859 lbs. | 35½ bush. | 3593 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. | 147½ cwt. | 333½ cwt. | 12½ cwt. | 346½ cwt. |
| 1857 | Barley | 48½ bush. | 2600 lbs. | 5337 lbs. | 28½ bush. | 1475 lbs. | 3976 lbs. | 4½ bush. | 2435 lbs. | 5165 lbs. |
| 1858 | Beans | 6½ bush. | 1100 lbs. | 1515 lbs. | 6½ bush. | 1155 lbs. | 1605 lbs. | 12½ bush. | 1530 lbs. | 2357 lbs. |
| 1859 | Wheat | 35½ bush. | 4030 lbs. | 6262 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. | 294 cwt. | 1½ cwt. | 30½ cwt. | 87½ cwt. | 5½ cwt. | 90½ cwt. |
| 1861 | Barley | 38½ bush. | 2322 lbs. | 4718 lbs. | 304 bush. | 2000 lbs. | 3775 lbs. | 6½ bush. | 3940 lbs. | 7391 lbs. |
| 1862 | Beans | 29 bush. | 1840 lbs. | 3661 lbs. | 29½ bush. | 2150 lbs. | 4040 lbs. | 43½ bush. | 3280 lbs. | 5990 lbs. |
| 1863 | Wheat | 44½ bush. | 3467 lbs. | 6350 lbs. | 34½ bush. | 3390 lbs. | 5619 lbs. | 46½ bush. | 4397 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 | 39 bush. | 2154 lbs. | 4182 lbs. | 33½ bush. | 1615 lbs. | 3394 lbs. | 4½ bush. | 2355 lbs. | 5148 lbs. |
| 1866 | Beans | 10½ bush. | 1013 lbs. | 1629 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. | 4367 lbs. |
| 6TH COURSE, 1868-71. | | | | | | | | | | |
| 1868 | Swedish Turnips | 24½ bush. | Failed, and ploughed up. | 3358 lbs. | 28½ bush. | Failed, and ploughed up. | 3686 lbs. | 42½ bush. | Failed, and ploughed up. | 5800 lbs. |
| 1869 | Barley | 13½ bush. | 1948 lbs. | 1591 lbs. | 15½ bush. | 2025 lbs. | 769 lbs. | 24½ bush. | 3509 lbs. | 2664 lbs. |
| 1870 | Beans | 20½ bush. | 738 lbs. | 1591 lbs. | 23½ bush. | 3049 lbs. | 4521 lbs. | 23 bush. | 1056 lbs. | 2664 lbs. |
| 1871 | Wheat | 20½ bush. | 2799 lbs. | 4092 lbs. | 23½ bush. | 3049 lbs. | 4521 lbs. | 23 bush. | 3440 lbs. | 4883 lbs. |
| 7TH COURSE, 1872-75. | | | | | | | | | | |
| 1872 | Swedish Turnips | 34½ cwt. | 8½ cwt. | 42½ cwt. | 1704 cwt. | 17½ cwt. | 188 cwt. | 333½ cwt. | 55½ cwt. | 375½ cwt. |
| 1873 | Barley | 23½ bush. | 1343 lbs. | 2717 lbs. | 204 bush. | 1565 lbs. | 2875 lbs. | 31½ bush. | 1723 lbs. | 3573 lbs. |
| 1874 | Clover | .. | .. | 31½ cwt. | .. | .. | 52½ cwt. | .. | .. | 84½ cwt. |
| 1875 | Wheat | 21½ bush. | 2430 lbs. | 3784 lbs. | 28½ bush. | 3536 lbs. | 5328 lbs. | 31½ bush. | 4685 lbs. | 6699 lbs. |
| 8TH COURSE, 1876-79. | | | | | | | | | | |
| 1876 | Swedish Turnips | 17½ cwt. | 5 cwt. | 22½ cwt. | 184 cwt. | 284 cwt. | 216½ cwt. | 356 cwt. | 55½ cwt. | 411½ cwt. |
| 1877 | Barley | 22½ bush. | 1291 lbs. | 2623 lbs. | 244 bush. | 1174 lbs. | 2558 lbs. | 244 bush. | 1913 lbs. | 3890 lbs. |
| 1878 | Beans | 8½ bush. | 740 lbs. | 1301 lbs. | 74 bush. | 1045 lbs. | 1587 lbs. | 204 bush. | 1655 lbs. | 2983 lbs. |
| 1879 | Wheat | 10½ bush. | 1324 lbs. | 1987 lbs. | 14½ bush. | 1771 lbs. | 2729 lbs. | 13 bush. | 1658 lbs. | 2493 lbs. |
| 9TH COURSE, 1880-83. | | | | | | | | | | |
| 1880 | Swedish Turnips | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 1881 | Barley | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 1882 | Clover or Beans | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| 1883 | Wheat | .. | .. | .. | .. | .. | .. | .. | .. | .. |

SUMMARY—AVERAGE OF THE FIRST 8 COURSES, 1848-1879.

| Years | Description of Crop | Corn ³ | Straw | Total Produce ⁴ | Corn ³ | Straw | Total Produce ⁴ | Corn ³ | Straw | Total Produce ⁴ |
|---|--------------------------------------|-------------------|-----------|----------------------------|-------------------|-----------|----------------------------|-------------------|-----------|----------------------------|
| 1848, '52, '56, '60, '64, '72, '76 | Swedish Turnips | 26½ cwt. | 9½ cwt. | 36½ cwt. | 148½ cwt. | 264 cwt. | 175½ cwt. | 272½ cwt. | 43½ cwt. | 315½ cwt. |
| 1849, '53, '57, '61, '65, '69, '73, '77 | Barley | 34½ bush. | 2159 lbs. | 4132 lbs. | 28½ bush. | 1730 lbs. | 3346 lbs. | 41½ bush. | 2577 lbs. | 4955 lbs. |
| 1850, '54, '58, '62, '66, '70, '74, '78 | Clover, 1850 and, '74 (calc. as hay) | .. | .. | 42½ cwt. | .. | .. | 55 cwt. | .. | .. | 73½ cwt. |
| 1851, '55, '59, '63, '67, '71, '75, '79 | Beans | 12½ bush. | 1081 lbs. | 1887 lbs. | 12½ bush. | 1200 lbs. | 1996 lbs. | 21½ bush. | 1809 lbs. | 3230 lbs. |
| | Wheat | 27½ bush. | 2905 lbs. | 4649 lbs. | 27½ bush. | 3067 lbs. | 4823 lbs. | 30½ bush. | 3698 lbs. | 5662 lbs. |

(1) First Course—100 lbs. Bone-ash, and 100 lbs. Sulphuric Acid (sp. gr. 1.7); Second Course—180 lbs. Bone-ash, 120 lbs. Sulphuric Acid; Third, Fourth, Fifth, Sixth, Seventh, Eighth, and Ninth 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. Sulphate of Soda, 100 lbs. Rape-cake; Second Course—300 lbs. Sulphate of Potass, 100 lbs. Sulphate of Soda, 100 lbs. Sulphate of Ammonia, 100 lbs. Muriate of Ammonia, and 2000 lbs. Rape-cake, per acre.
 (3) The quantities given in Bushels represent the Dressed Corn only.
 (4) The "Total Produce" of the Corn-crops includes Dressed Corn, Offal Corn, Straw, and Chaff.