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# Yields of the Field Experiments 1876

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## Experiments on Permanent Meadow Land; the Park

### Rothamsted Research

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THE PARK.

EXPERIMENTS WITH DIFFERENT MANURES ON PERMANENT MEADOW LAND.

The Land has probably been laid down with Grass for some centuries. No fresh seed has been artificially sown within the last 40 years certainly; nor is there record of any having been sown since the Grass was first laid down. The experiments commenced in 1856, at which time the character of the herbage appeared uniform over all the Plots. Excepting as explained in the Table and in the foot-notes, the same description of Manure has been applied year after year to the same Plot.

(Area under experiment, about 7 acres.)

| PLOTS. | MANURES, per acre, per Annum.   |   |                         |                         |                         |                         |                         |                         |                         |                         | PRODUCE PER ACRE, WEIGHED AS HAY. |                         |                         |                             |        |  |
|--------|---|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----------------------------------|-------------------------|-------------------------|-----------------------------|--------|--|
|        |   |   |                         |                         |                         |                         |                         |                         |                         |                         | Average per Annum.                |                         |                         | Twentieth Season, 1875 (3). |        |  |
|        | 10 Years, 1866-75. (15)   | 10 Years, 1866-75. (15)   | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15) | 10 Years, 1866-75. (15)           | 20 Years, 1866-75. (15) | 20 Years, 1866-75. (15) | 20 Years, 1866-75. (15)     | Total. |  |
| 1      | 1856-63, 8 years, 14 tons Farmyard Manure, and 200 lbs. Ammonia-salts (1); average produce 49½ cwts. (1864 and since, 200 lbs. Ammonia-salts alone; average produce (1½) years, 1864-75) 44½ cwts.  | 0-40 Hectare .. .. . or 1-59 Prussian Morgen .. .. . or 0-91 Zollweiser Pfund .. .. . | 48½                     | 43                      | 37½                     | 48                      | 33½                     | 33                      | 32                      | 36½                     | 33½                               | 33                      | 33                      | 33                          | 51½    |  |
| 2      | 1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (1864 and since, unmanured; average produce (1½) years, 1864-75) 38½ cwts.   | 1 cwt. (hundredweight) .. .. . or 1-02 Centner .. .. .                                | 41½                     | 36                      | 32                      | 36                      | 32                      | 32                      | 20                      | 21½                     | 32                                | 26½                     | 26                      | 11½                         | 38½    |  |
| 3      | Unmanured, continuously   | 1 ton .. .. . or 20-33 Centner .. .. .  | 22½                     | 20                      | 21½                     | 20                      | 21½                     | 21½                     | 21½                     | 21½                     | 21½                               | 21                      | 21                      | 12½                         | 32½    |  |
| 4      | 3½ cwts. Superphosphate of Lime (2)   | 1-12 Kilogramme per Hectare or 0-57 Zollv. Pfd. per Pr. Morgen.                       | 23½                     | 21½                     | 22½                     | 21½                     | 21½                     | 21½                     | 21½                     | 21½                     | 21½                               | 21½                     | 21½                     | 21½                         | 36½    |  |
| 5      | 3½ cwts. Superphosphate of Lime, and 400 lbs. Ammonia-salts   | 125-5 Kilogrammes per Hectare or 0-64 Centner per Pr. Morgen.                         | 33½                     | 33                      | 30½                     | 33                      | 33                      | 33                      | 33                      | 33                      | 33                                | 33                      | 33                      | 33                          | 51     |  |
| 6      | 400 lbs. Ammonia-salts  | 2510-0 Kilogrammes per Hectare or 12-82 Centner per Pr. Morgen.                       | 30½                     | 22                      | 26½                     | 26½                     | 26½                     | 26½                     | 26½                     | 26½                     | 26½                               | 26½                     | 26½                     | 26½                         | 42½    |  |
| 7      | 1856-68, 13 years, 400 lbs. Ammonia-salts; average produce 30½ cwts. (1869 and since, 300 lbs. Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphos.; av. prod. (4-7) yrs., 1869-75) 34½ cwts.  | Manures, per acre, per Annum.   | 31½                     | 30½                     | 30½                     | 30½                     | 30½                     | 30½                     | 30½                     | 30½                     | 30½                               | 30½                     | 30½                     | 30½                         | 50½    |  |
| 8      | 300 lbs. Sulphate Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate  |   | 33½                     | 36½                     | 35½                     | 36½                     | 36½                     | 36½                     | 36½                     | 36½                     | 36½                               | 36½                     | 36½                     | 36½                         | 64½    |  |
| 9      | 1862 and since, 250 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate; average produce (1½) years, 1862-75) 24½ cwts.   |   | 33½                     | 26½                     | 30                      | 30                      | 30                      | 30                      | 30                      | 30                      | 30                                | 28½                     | 28                      | 16                          | 44½    |  |
| 10     | 300 lbs. Sulphate Potass., 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, 3½ cwts. Superphosphate, and 400 lbs. Ammonia-salts  |   | 53                      | 48                      | 51                      | 51                      | 51                      | 51                      | 51                      | 51                      | 51                                | 52                      | 52                      | 24½                         | 76½    |  |
| 11     | 1856-61, 6 yrs., 300 lbs. Sulph. Potass., 200 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphosphate; average produce 36 cwts. (1862 and since, 250 lbs. Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphosphate; av. prod. (1½) years, 1862-75) 45½ cwts. |   | 52½                     | 52½                     | 46                      | 46                      | 46                      | 46                      | 46                      | 46                      | 46                                | 43                      | 43                      | 24½                         | 67½    |  |
| 12     | 300 lbs. Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphosphate, 800 lbs. Ammonia-salts  |   | 61½                     | 61½                     | 57                      | 57                      | 57                      | 57                      | 57                      | 57                      | 57                                | 46                      | 46                      | 50                          | 97½    |  |
| 13     | Unmanured continuously  |   | 25                      | 22                      | 22                      | 22                      | 22                      | 22                      | 22                      | 22                      | 22                                | 24                      | 23½                     | 14½                         | 37½    |  |
| 14     | 300 lbs. Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphosphate, and 400 lbs. Silicate Soda (3)  |   | 55½                     | 59                      | 59                      | 59                      | 59                      | 59                      | 59                      | 59                      | 59                                | 65                      | 65                      | 30½                         | 95½    |  |
| 15     | 550 lbs. Nitrate of Soda (4), 300 lbs. Sulphate Potass., 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate  |   | 55½                     | 60                      | 60                      | 60                      | 60                      | 60                      | 60                      | 60                      | 60                                | 62½                     | 62½                     | 17½                         | 80½    |  |
| 16     | 1858-75, 18 years, 550 lbs. Nitrate Soda (1876, 300 lbs. Sulphate Potass., 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate  |   | 36                      | 35                      | 35                      | 35                      | 35                      | 35                      | 35                      | 35                      | 35                                | 29                      | 29                      | 13                          | 42½    |  |
| 17     | 275 lbs. Nitrate of Soda, 300 lbs. Sulphate Potass., 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate  |   | 45½                     | 47                      | 46½                     | 46½                     | 46½                     | 46½                     | 46½                     | 46½                     | 46½                               | 45                      | 45                      | 16                          | 61½    |  |
| 18     | Mixture supplying the quantity of Potass., Soda, Lime, Magnesia, Phosphoric acid, Silica, and Nitrogen, contained in 1 ton of Hay (commencing 1865)   |   | 34                      | 33                      | 33                      | 33                      | 33                      | 33                      | 33                      | 33                      | 33                                | 30                      | 30                      | 13                          | 43     |  |
| 19     | 275 lbs. Nitrate of Soda, 200 lbs. Sulphate of Potass., and 3½ cwts. Superphosphate (commencing 1872)   |   | 21                      | 33                      | 32½                     | 32½                     | 32½                     | 32½                     | 32½                     | 32½                     | 32½                               | 34                      | 34                      | 15                          | 50½    |  |
| 20     | 327 lbs. Nitrate of Potass., and 3½ cwts. Superphosphate (commencing 1872)  |   | ..                      | ..                      | ..                      | ..                      | ..                      | ..                      | ..                      | ..                      | ..                                | 36½                     | 36½                     | 21½                         | 63½    |  |

(1) Ammonia-salts;—in all cases equal parts Sulphate and Murate of Ammonia of Commerce. (2) The "Superphosphate of Lime" is, in all cases, made from 200 lbs. Bone-ash, 150 lbs. Sulphuric Acid, 50 gr. 1-7 (and water). (3) Plots 6, 8, and 10, had, besides the Manures specified, 2000 lbs. Sawdust per acre per annum for the first 7 years, 1856-1862, but without effect. (4) 200 lbs. 1856-63 inclusive. (5) 500 lbs. in 1862 and 1863. (6) Only 400 lbs. in 1859-60-61. (7) The application of Silicates did not commence until 1862. (8) 550 lbs. Nitrate of Soda is reckoned to contain the same amount of Nitrogen as 400 lbs. of Ammonia-salts. (9) The manures specified were first applied in 1859 (previously, 1856-7 and 8, Sawdust only). (10) Averages of 8 years, 10 years, and 18 years, as these experiments did not commence until 1858. (11) Averages of 10 years, 10 years, and 11 years, as the experiment only commenced in 1865. (12) Averages of 4 years only, 1872-75. (13) In previous years the second crop has either been fed off by sheep, without other food, or mown and left on the ground; but in the twentieth season, 1875, it was so unusually heavy, that it was cut, weighed as hay, and removed. (14) The second crop of the twentieth season (1875) is not included in these averages, as in all other years the first crop only was weighed and removed.