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## Exhaustion Land Experiment plans and fertilizer treatments, Phases I & II, 1856-1939

**DOI:** [10.23637/EX4-sup-003-01](https://doi.org/10.23637/EX4-sup-003-01)

**Cite as:** Glendining, M.J and Poulton, P.R. (2016) *Exhaustion Land Experiment plans and fertilizer treatments, Phases I & II, 1856-1939*. *Electronic Rothamsted Archive, Rothamsted Research, Harpenden, UK*. [10.23637/EX4-sup-003-01](https://doi.org/10.23637/EX4-sup-003-01)

**Published by:** Electronic Rothamsted Archive, Rothamsted Research, Harpenden, UK

**Date:** Created 2016, updated October 2022, with addition of plot numbers 1856-1875 (I-V)

**Description:** Plans and details of the fertilizer treatments and total nutrients applied to the Rothamsted Exhaustion Land Experiment, Phase I (1856-1901) and Phase II (1902-1939).

- **Page 1:** Cover page
- **Page 2:** Experiment overview, 1856-present day
- **Page 3:** Experiment plan Phases I and II
- **Page 4:** Total nutrients applied, Phase I

**Site:** R/EX/4. Hoos Field, Rothamsted Experimental Farm, Rothamsted Research, West Common, Harpenden, Hertfordshire, AL5 2JQ, UK. Latitude 51.812883, Longitude -0.375931

### Derived from:

- Rothamsted Experimental Station (1970) *Details of the Classical and Long-Term Experiments up to 1967*, Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK  
**DOI:** [10.23637/ERADOC-1-192](https://doi.org/10.23637/ERADOC-1-192)
- Rothamsted (1991) *Guide to the Classical Field Experiments*, Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK **DOI:** [10.23637/ERADOC-1-189](https://doi.org/10.23637/ERADOC-1-189)
- Johnston, A. E. and Poulton, P. R.(1977) "Yields on the Exhaustion Land and changes in NPK content of the soils due to cropping and manuring, 1852-1975", Rothamsted Experimental Station Annual Report for 1976, Part 2, (53-85) **DOI:** [10.23637/ERADOC-1-34447](https://doi.org/10.23637/ERADOC-1-34447)
- Johnston, A.E, Poulton P.R, White, R.P & Macdonald, A.J. (2016). *Determining the longer term decline in plant-available soil phosphorus from short-term measured values*, **Soil Use & Management**, **DOI:** [10.1111/sum.12253](https://doi.org/10.1111/sum.12253)
- Poulton, P.R, Johnston, A.E. and White, R.P. (2013) *Plant-available soil phosphorus. Part 1: the response of winter wheat and spring barley to Olsen P on a silty clay loam*. **Soil Use & Management**, **DOI:** [10.1111/j.1475-2743.2012.00450.x](https://doi.org/10.1111/j.1475-2743.2012.00450.x)

**Funding:** Rothamsted Research receives strategic funding from the UK Biotechnology and Biological Sciences Research Council (BBSRC). The Rothamsted Long-term Experiments National Capability is supported by the BBSRC Grant BBS/E/C/000J0300 and the Lawes Agricultural Trust.

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# Exhaustion Land Experiment Plan

1856-1901

Phase I

1902-1939

Phase II

↗ N

					Years
<b>Plot I</b> W wheat PKNaMg  <b>Plot 10</b> Potatoes PKNaMg  Cereals Nil	<b>Plot II</b> W wheat NPKNaMg  <b>Plot 8</b> Potatoes N*PKNaMg  Cereals Nil	<b>Plot III</b> W wheat N  <b>Plot 6</b> Potatoes N*  Cereals Nil	<b>Plot IV</b> W wheat Nil  <b>Plot 4</b> Potatoes FYM (N*P)  Cereals Nil	<b>Plot V*</b> W wheat Nil  <b>Plot 2</b> Potatoes Nil (FYM)  Cereals Nil	1856-1875
					1876-1901
					1902-1939
<b>Plot 9</b> Potatoes P  Cereals Nil	<b>Plot 7</b> Potatoes NPKNaMg  Cereals Nil	<b>Plot 5</b> Potatoes N  Cereals Nil	<b>Plot 3</b> Potatoes FYM (P)  Cereals Nil	<b>Plot 1</b> Potatoes Nil  Cereals Nil	1876-1901
					1902-1939

(not to scale)

\*Plot V narrower than other plots 1856-1875; additional unfertilized area (Butts) added in 1876 to make new plots 1 and 2 the same size as the other plots.

## Plot size and numbering:

Plots I-V	1856-1875	0.162 hectares (plot V 0.081 hectares)
Plots 1-10	1876-1892	0.081 hectares
Plots 1-10	1893-1939	0.068 hectare

In 1893 paths were added between the plots reducing the cropped area.

## Annual Treatments per hectare, 1856-1901:

Nil : No fertilizer or manure

FYM : 35 of farmyard manure since 1876

Nil (FYM) : FYM 1876-1881, no fertilizer or manure 1882-1901

FYM (P) : FYM plus P 1876-1882, FYM only 1883-1901

FYM (N\*P) : FYM plus N\* and P 1876-1881, FYM plus P 1882, FYM only 1883-1901

N : 96 kg N as ammonium salts (ammonium sulphate & ammonium chloride)

N\* : 96 kg N as sodium nitrate

P : 34 kg P (as superphosphate 1856-96, from basic slag 1897-1901)

K : 137 kg K as potassium sulphate (91 kg K 1859-74)

Na : 16 kg Na as sodium sulphate

Mg : 11 kg Mg as magnesium sulphate

**1902-1939:** No fertilizer or manure applied, cereals grown most years

## Previous cropping:

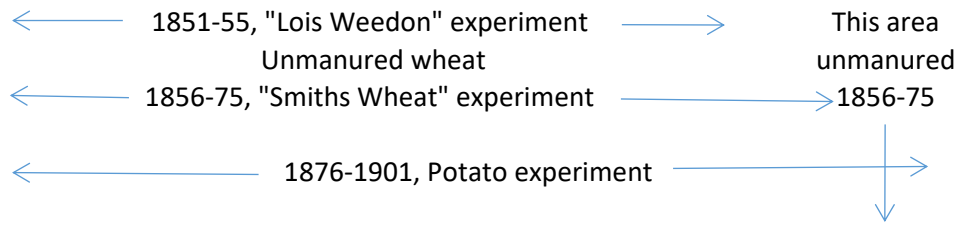
1851-1855 The 'Lois Weedon' plots, which tested different methods of husbandry.

No fertilizer or manure applied to the whole experimental area, w wheat grown.

# R/EX/4 Exhaustion Land experiment

↗ N

## Experimental layout and total nutrients applied, Phase I



Plot No.	I	II	III	IV	V*
1856-1875	I PKNaMg	II NPKNaMg	III N	IV Nil	V* Nil
1876-1975	<b>10</b> PKNaMg	<b>8</b> N*PKNaMg	<b>6</b> N*	<b>4</b> FYM, N*P	<b>2</b> FYM
1856-1901 Total nutrients applied in FYM and/or fertilizer kg/ha					
<b>N</b>	0	3870	3870	6364	1344
<b>P</b>	1410	1410	0	1260	235
<b>K</b>	5040	5040	0	3920	900
1876-1975	<b>9</b> P	<b>7</b> NPKNaMg	<b>5</b> N	<b>3</b> FYM, P	<b>1</b> Nil
<b>N</b>	0	3870	3870	5824	0
<b>P</b>	1410	1410	0	1260	0
<b>K</b>	1570	5040	0	3920	0

(not to scale)

\* Plot V narrower than the other plots 1856-1875: additional unfertilized area added in 1876 to make new plots 1 and 2 the same size as plots 3-10.