

# Exhaustion Land Experiment Plan

1986-1992

Phase IV

P build up phase

↗ N

<b>Plot 10</b> 101 <b>N1</b>	<b>Plot 8</b> 081 <b>N1</b>	<b>Plot 6</b> 061 <b>N1</b>	<b>Plot 4</b> 041 <b>N1</b>	<b>Plot 2</b> 021 <b>N1</b>
102 <b>N0</b>	082 <b>N0</b>	062 <b>N0</b>	042 <b>N0</b>	022 <b>N0</b>
(PKNaMg)	(N*PKNaMg)	(N*)	(FYM(N*P))	(Nil (FYM))
(1876-1901)	(1876-1901)	(1876-1901)	(1876-1901)	(1876-1901)
103 <b>N3</b>	083 <b>N3</b>	063 <b>N3</b>	043 <b>N3</b>	023 <b>N3</b>
104 <b>N2</b>	084 <b>N2</b>	064 <b>N2</b>	044 <b>N2</b>	024 <b>N2</b>
<b>Plot 9</b> 091 <b>P3</b>	<b>Plot 7</b> 071 <b>P3</b>	<b>Plot 5</b> 051 <b>P3</b>	<b>Plot 3</b> 031 <b>P3</b>	<b>Plot 1</b> 011 <b>P3</b>
092 <b>P2</b>	072 <b>P2</b>	052 <b>P2</b>	032 <b>P2</b>	012 <b>P2</b>
(P)	(NPKNaMg)	(N)	(FYM(P))	(Nil)
(1876-1901)	(1876-1901)	(1876-1901)	(1876-1901)	(1876-1901)
093 <b>P1</b>	073 <b>P1</b>	053 <b>P1</b>	033 <b>P1</b>	013 <b>P1</b>
094 <b>P0</b>	074 <b>P0</b>	054 <b>P0</b>	034 <b>P0</b>	014 <b>P0</b>

(not to scale)

## Annual Treatments per hectare, 1986-1992:

### "P Test" sub-plots (Plots 1,3,5,7 and 9)

P0: No P

P1: 44 kg P as triple superphosphate

P2: 87 kg P as triple superphosphate

P3: 131 kg P as triple superphosphate

Plus basal manuring 144 kg N and 83 kg K to all P sub-plots

P applied 7 times, 1986-1991 (spring 1986, autumn 1986 then each autumn up to 1991)

NB 'year' refers to harvest year, the P is applied the previous autumn.

### "N Test" sub-plots (Plots 2,4,6,8 and 10)

N0: No N

N1: 48 kg N calcium ammonium nitrate

N2: 96 kg N calcium ammonium nitrate

N3: 144 kg N calcium ammonium nitrate

N rates rotate each year N0>N3>N2>N1, eg N0 1986, N3 1987, N2 1988, N1 1989, N0 1990

**Cropping:** Spring barley 1986-1991; winter wheat 1992

**Annual Treatments per hectare, 1856-1901, Phase I:**

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 until 1882, FYM only 1883-1901

FYM (N\*P) : FYM plus N\* and P until 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 1876-96, 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

**Sources of data:**

Rothamsted (1991) "Guide to the Classical Field Experiments",

*Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK*

Poulton, P. R. , Johnston, A. E. and White, R. P. (2013) "Plant-available soil phosphorus. Part I: the response of winter wheat and spring barley to Olsen P on a silty clay loam", *Soil Use and Management*, 29, 4-11

Johnston, A.E., Poulton, P.R., White, R.P. and Macdonald, A.J. (2016) "Determining the longer term decline in plant-available soil phosphorus from short-term measured values", *Soil Use and Management* doi:10.1111/sum.12253

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