

Exhaustion Land Experiment Plan

2007-

Phase V

↗ N

Plot 10 101 K0	Plot 8 081 K0	Plot 6 061 K0	Plot 4 041 K0	Plot 2 021 K0
102 K0	082 K0	062 K0	042 K0	022 K0
(PKNaMg) (1876-1901)	(N*PKNaMg) (1876-1901)	(N*) (1876-1901)	(FYM(N*P)) (1876-1901)	(Nil (FYM)) (1876-1901)
103 K1	083 K1	063 K1	043 K1	023 K1
104 K2	084 K2	064 K2 "K Test"	044 K2	024 K2
Plot 9 091 P (P3)	Plot 7 071 P (P3)	Plot 5 051 P (P3)	Plot 3 031 P (P3)	Plot 1 011 P (P3)
092 (P2) P (P)	072 (P2) P (NPKNaMg)	052 (P2) P (N)	032 (P2) P (FYM(P))	012 (P2) P (Nil)
(1876-1901)	(1876-1901)	(1876-1901)	(1876-1901)	(1876-1901)
093 P (P1)	073 P (P1)	053 P (P1)	033 P (P1)	013 P (P1)
094 (P0) Nil	074 (P0) Nil	054 (P0) Nil "P Test"	034 (P0) Nil	014 (P0) Nil

(not to scale)

Annual Treatments per hectare, 2007-:

"K Test" (Plots 2,4,6,8 and 10)

K0: Nil

K1: 62.2 kg K as muriate of potash

K2: 124.5 kg K as muriate of potash

Basal manuring to all plots:

300 kg N & 20 kg P (15 kg P since 2009) each year, and 20 kg Mg every three years (12 kg Mg annually since 2009).

"P Test" (Plots 1,3,5,7 and 9) since 2000:

'Maintenance' P to all plots, except Nil

Nil: No fertilizer or manure

P: 20 kg P as triple superphosphate in autumn 2007-8; 15 kg P 2009-

P has not been applied to plots 013,033,053,073 & 093 since 2016 (autumn 2015).

Basal manuring to all plots:

300 kg N & 124.5 kg K each year, and 20 kg Mg every three years (12 kg Mg annually since 2009).

Cropping: Winter wheat 2007 onwards

Annual Treatments per hectare, 1986-1992:

- (P0): No P
- (P1): 44 kg P as triple superphosphate
- (P2): 87 kg P as triple superphosphate
- (P3): 131 kg P as triple superphosphate

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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