*This work is licensed under a Creative Commons Attribution 4.0 International License.*

Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readible, or you suspect there are some problems, please let us know and we will correct that.

# Yields of the Field Experiments

*Full Table of Content*

# R/EX/4 Exhaustion Land

## Rothamsted Research

Rothamsted Research (2016) *R/EX/4 Exhaustion Land ;* Yields Of The Field Experiments , pp 24 - 27
**- DOI: https://doi.org/10.23637/ERADOC-1-249**

*This work is licensed under a Creative Commons Attribution 4.0 International License.*

## 16/R/EX/4

### EXHAUSTION LAND

**Object**: To study the residual effects of manures applied 1856 - 1901, and of additional phosphate applied since 1986 (P test) and of additional potassium since 2007 (K test); on the yield of continuous s. barley up to 1991, w. wheat since – Hoosfield.

The 161st year, w. wheat.

For previous years see 'Details' 1977, 1973 and Yield Books for 74-14/R/EX/4

**Treatments:** All combinations of:-

Whole plots (P test)

1. **OLD RES** Residues of manures applied annually 1876 – 1901:

| | |
|---|---|
| O | None |
| D | Farmyard manure at 35 t |
| N | 96 kg N as ammonium salts |
| P | 34 kg P as superphosphate |
| NPKNAMG | N and P as above plus 137 kg K as sulphate of potash, 16 kg Na as sulphate of soda, 11 kg Mg as sulphate of magnesia |

2. **P** Maintenance P (20 kg P) applied annually from 2000 to maintain existing levels of available P In the soil. In 2009 maintenance P applications were changed from 20 kg P/ha to 15 kg P/ha. This was not recorded in the yield books for 2009-13. (P1) (P2) and (P3) are residues of P applied annually 1986–1992:

| | 2009-Present | 2000-08 | 1986-92 |
|---|---|---|---|
| O | None | None | None |
| P (P1) | 15 kg P | 20 kg P | 44 kg P |
| P (P2) | 15 kg P | 20 kg P | 87 kg P |
| P (P3) | 15 kg P | 20 kg P | 131 kg P |

**NOTE**: P treatments were applied at 61.5 kg P in error in 2000.

Plus

Whole plots (K test, previously N test until 1991

**1. OLD RES** Residues of manures applied annually 1876 – 1901:

| | |
|---|---|
| O | None |
| D | Farmyard manure at 35 t |
| N* | 96 kg N as nitrate of soda |
| PK | 34 kg P as superphosphate, 137 kg K as sulphate of potash |
| N*PK | N, P and K as above |

**2. K** Potassium applied annually from 2007 as muriate of potash



*https://doi.org/10.23637/ERADOC-1-249* 

This work is licensed under a Creative Commons Attribution 4.0 International License.

| | |
|---|---|
| O | None |
| K1 | 75 kg $K_2O$ (62.2 kg K) |
| K2 | 150 kg $K_2O$ (124.5 kg K) |

Whole plots

Nitrogen: 50 kg N as ammonium sulphate (to supply sufficient S) during first two weeks in March, 200 kg N as ammonium nitrate at GS31/mid-April (whichever comes first) and 50 kg N as ammonium nitrate at GS37 (not later than mid-May)

**Experimental diary**

| Date | | Application | Rate | Units |
|---|---|---|---|---|
| 25/08/2015 | p | Sprayed Firebrand | 1 | lt/ha |
| 25/08/2015 | p | Sprayed Samurai | 4 | lt/ha |
| 01/10/2015 | f | Applied MOP - Plots 103, 83, 63, 43 + 23 | 125 | kg/ha |
| 01/10/2015 | f | Applied MOP - Plots 094-014, 092-012, 104-024, 093-013, 091-011 | 250 | kg/ha |
| 01/10/2015 | f | Applied TSP - plots 101-021, 102-022, 103-023, 104-024, 091-011 + 092-012 | 75 | kg/ha |
| 09/10/2015 | a | Ploughed; thrown south | - | - |
| 09/10/2015 | a | Topped all field and exp - Batwing | - | - |
| 15/10/2015 | a | Power harrowed - Seed bed preparation | - | - |
| 15/10/2015 | s | Drilled Crusoe trt Redigo | 350 | seed/$m^2$ |
| 18/10/2015 | a | Ring Rolled all new drilling | - | - |
| 19/10/2015 | p | Sprayed WW - Liberater | 0.6 | lt/ha |
| 19/10/2015 | p | Sprayed WW - Stomp Aqua | 1.75 | lt/ha |
| 12/11/2015 | p | Sprayed Hallmark | 40 | ml/ha |
| 03/12/2015 | p | Applied TDS Major | 5 | kg/ha |
| 12/12/2015 | p | Sprayed Hallmark | 40 | ml/ha |
| 21/03/2016 | f | Applied Sulphate of Ammonia | 238 | kg/ha |
| 04/04/2016 | f | Applied Nitram @ 34.5%N | 840 | kg/ha |
| 08/04/2016 | p | Sprayed Moddus | 150 | ml/ha |
| 08/04/2016 | p | Sprayed BASF 3C Chlormequat750 | 1.25 | lt/ha |
| 08/04/2016 | p | Sprayed Odin | 500 | ml/ha |
| 08/04/2016 | p | Sprayed Mirage 40ec | 500 | ml/ha |
| 08/04/2016 | p | Sprayed Bravo500 | 1 | lt/ha |
| 13/04/2016 | f | Applied Kieserite - all plots | 80 | kg/ha |
| 05/05/2016 | p | Sprayed Keystone - wheat only | 800 | ml/ha |
| 05/05/2016 | p | Sprayed Keystone - wheat only | 700 | ml/ha |
| 24/05/2016 | p | Sprayed Vortex | 1.5 | lt/ha |
| 24/05/2016 | p | Sprayed VortexCorbel | 250 | ml/ha |
| 09/07/2016 | p | Sprayed Cello | 550 | ml/ha |
| 09/07/2016 | p | Sprayed Hallmark | 50 | ml/ha |
| 22/08/2016 | a | Cut Paths using Iseki and Mower | - | - |
| 23/08/2016 | a | Mopped Up remaining crop | - | - |
| 25/08/2016 | a | Harvested All Plots | - | - |



https://doi.org/10.23637/ERADOC-1-249 

*This work is licensed under a Creative Commons Attribution 4.0 International License.*

| | | | | |
|---|---|---|---|---|
| 26/08/2016 | a | Combined all crop using Tucano | - | - |
| 25/08/2015 | p | Sprayed Firebrand | 1 | lt/ha |

Note: Samples of grain and straw were taken for chemical analysis. The yield strips on plots 031-034, 071- 074, 091- 094 (12 plots in total) were made smaller this year to avoid areas where the crop had already been sampled by S. McGrath et al.

**16/R/EX/4**

**P TEST**

**Grain tonnes/hectare**

******* Tables of means *******

| P_RES | O | P1 | P2 | P3 | Mean |
|---|---|---|---|---|---|
| OLD_RES | | | | | |
| O | 2.48 | 7.72 | 8.51 | 9.12 | 6.96 |
| D | 5.66 | 10.35 | 10.85 | 11.49 | 9.59 |
| N | 2.33 | 8.07 | 9.90 | 9.59 | 7.47 |
| P | 4.23 | 9.89 | 10.93 | 11.27 | 9.08 |
| NPKNAMG | 3.96 | 7.98 | 11.11 | 11.83 | 8.72 |
| Mean | 3.73 | 8.80 | 10.26 | 10.66 | 8.36 |

**Grain mean DM% 85.2**

**Straw tonnes/hectare**

******* Tables of means *******

| P_RES | O | P1 | P2 | P3 | Mean |
|---|---|---|---|---|---|
| OLD_RES | | | | | |
| O | 2.49 | 6.84 | 7.76 | 7.49 | 6.14 |
| D | 5.33 | 9.5 | 9.49 | 8.94 | 8.32 |
| N | 1.90 | 7.56 | 8.45 | 7.68 | 6.40 |
| P | 3.59 | 7.56 | 8.47 | 8.05 | 6.92 |
| NPKNAMG | 3.92 | 7.22 | 9.13 | 8.80 | 7.27 |
| Mean | 3.45 | 7.74 | 8.66 | 8.19 | 7.01 |

**Straw mean DM% 92.1**

**Plot area harvested 0.00538, 0.00252.**

**K TEST**

**Grain tonnes/hectare**

******* Tables of means *******



*https://doi.org/10.23637/ERADOC-1-249* 

*This work is licensed under a Creative Commons Attribution 4.0 International License.*

## 16/R/EX/4

| K_Test | K0 | K1 | K2 | Mean |
|---|---|---|---|---|
| OLD_RES | | | | |
| O | 9.14 | 10.50 | 10.48 | 9.82 |
| D | 8.76 | 10.92 | 10.86 | 9.83 |
| N* | 9.44 | 10.52 | 9.84 | 9.81 |
| PK | 10.54 | 10.51 | 10.18 | 10.44 |
| N*PK | 9.56 | 10.75 | 11.14 | 10.25 |
| Mean | 9.49 | 10.64 | 10.50 | 10.03 |

Grain mean DM% 85.5

Straw tonnes/hectare

***** Tables of means *****

| K_Test | K0 | K1 | K2 | Mean |
|---|---|---|---|---|
| OLD_RES | | | | |
| O | 6.70 | 8.34 | 8.40 | 7.53 |
| D | 6.55 | 8.05 | 8.12 | 7.32 |
| N* | 6.08 | 7.53 | 7.64 | 6.83 |
| PK | 7.22 | 7.08 | 7.19 | 7.18 |
| N*PK | 6.31 | 7.10 | 7.40 | 6.78 |
| Mean | 6.57 | 7.62 | 7.75 | 7.13 |

Straw mean DM% 96.6  Plot area harvested 0.00538



*https://doi.org/10.23637/ERADOC-1-249* 