

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 readable, or you suspect there are some problems, please let us know and we will correct that.



# Results of the Classical and Other Long-term Experiments 2004

Results of the  
Classical  
and other  
Long-term Experiments  
2004

Rothamsted Research

[Full Table of Content](#)

---

## 04/R/BK/1 - Broadbalk

### Rothamsted Research

Rothamsted Research (2005) *04/R/BK/1 - Broadbalk* ; Results Of The Classical And Other Long-Term Experiments 2004, pp 5 - 11 - DOI: <https://doi.org/10.23637/ERADOC-1-261>

04/R/BK/1

# BROADBALK

**Object:** To study the effects of organic manures and inorganic fertilisers on continuous w. wheat. From 1968 two three-year rotations were included: potatoes, beans, w. wheat and fallow, w. wheat, w. wheat. In 1979 the first rotation was changed to fallow, potatoes, w. wheat. In 1980 the second rotation reverted to continuous w. wheat. Since 1985 part of the second rotation was added to the first to extend the rotation to fallow, potatoes, w. wheat, w. wheat, w. wheat, in 1996 the fallow was replaced by w. oats and potatoes replaced by maize in 1997.

The 160th year, w. wheat, w. oats and forage maize.

For previous years see 'Details' 1967 and 1973, Station Report for 1966, pp. 229-231; Station Report for 1968, Part 2; Station Report for 1982, Part 2, pp. 5-44 and 74-03/BK/1.

## Areas harvested:

|        |             |         |
|--------|-------------|---------|
| Wheat: | Section     |         |
|        | 1           | 0.00589 |
|        | 2,3,5 and 6 | 0.00487 |
|        | 8,9         | 0.00512 |
| Oats:  | 4           | 0.00487 |
| Maize: | 7           | 0.00162 |

## Treatments:

In 2001 a number of the treatments were changed. The treatments are now: -

Whole plots

| PLOT                | Fertilizers and organic manures |                   |
|---------------------|---------------------------------|-------------------|
|                     | Treatments                      |                   |
|                     | Plot                            | from 2001         |
| 01 (FYM) N4         | 01                              | N4                |
| 21 FYM N2           | 2.1                             | FYM N2            |
| 22 FYM              | 2.2                             | FYM               |
| 03 Nil              | 03                              | None              |
| 05 (P) KMg          | 05                              | (P) K Mg          |
| 06 N1 (P) KMg       | 06                              | N1 (P) K Mg       |
| 07 N2 (P) KMg       | 07                              | N2 (P) K Mg       |
| 08 N3 (P) KMg       | 08                              | N3 (P) K Mg       |
| 09 N4 (P) KMg       | 09                              | N4 (P) K Kg       |
| 10 N4               | 10                              | N4                |
| 11 N4 PMg           | 11                              | N4 P Mg           |
| 12 N1+3+1 (P) K2Mg2 | 12                              | N1+3+1 (P) K2 Mg2 |
| 13 N4 PK            | 13                              | N4 P K            |
| 14 N4 PK* (Mg*)     | 14                              | N4 P K* (Mg*)     |
| 15 N5 (P) KMg       | 15                              | N5 (P) K Mg       |
| 16 N6 (P) KMg       | 16                              | N6 (P) K Mg       |
| 17 N1+4+1 PKMg      | 17                              | N1+4+1 P K Mg     |
| 18 N1+2+1 PKMg      | 18                              | N1+2+1 P K Mg     |
| 19 N1+1+1 KMg       | 19                              | N1+1+1 K Mg       |
| 20 N4 KMg           | 20                              | N4 K Mg           |

#### 04/R/BK/1

W. oats; Nitrogen and farmyard manure were not applied.

N1,N2,N3,N4,N5,N6: 48, 96, 144, 192, 240, 288 kg N as 33.5% N; to be applied at the same time as the second dressings in the split nitrogen plots for wheat and to the seedbed for forage maize.

Split N to wheat

N1+1+1, 1+2+1 etc: Rates as above. Timings: first two weeks of March, GS31 or mid-April (whichever comes first) and GS37/mid-May.

Split N to forage maize

N2+1,2+2,2+3,2+4: Rates as above. Timings: to the seedbed and post-emergence.

P: 35 kg P as triple superphosphate.

(P): (none), to be reviewed in 2004/5.

K: 90 kg K as potassium sulphate.

K2: 180 kg K as potassium sulphate (plus 450 kg K autumn 2000 only).

K\*: 90 kg K as potassium chloride.

Mg: 12 kg Mg as kieserite.

Mg2: 24 kg Mg as kieserite (plus 60 kg Mg, autumn 2000 only).

(Mg\*): (none), to be reviewed in 2004/5.

FYM: Farmyard manure at 35 t

Previous treatment: -

Whole plots

| PLOT     |      | Fertilizers and organic manures:- |                      |                             |
|----------|------|-----------------------------------|----------------------|-----------------------------|
|          | Plot | Treatments until 1967             | Treatments from 1968 | Treatments from 1985 - 2000 |
| 01DN4PK  | 01   | -                                 | D N2 P K             | D N4 P K                    |
| 21DN2    | 21   | D                                 | D N2                 | D N2                        |
| 22D      | 22   | D                                 | D                    | D                           |
| 030      | 03   | None                              | None                 | None                        |
| 05F      | 05   | P K Na Mg                         | P K (Na) Mg          | PK Mg                       |
| 06N1F    | 06   | N1 P K Na Mg                      | N1 P K (Na) Mg       | N1 P K Mg                   |
| 07N2F    | 07   | N2 P K Na Mg                      | N2 P K (Na) Mg       | N2 P K Mg                   |
| 08N3F    | 08   | N3 P K Na Mg                      | N3 P K (Na) Mg       | N3 P K Mg                   |
| 09N4F    | 09   | N*1 P K Na Mg                     | N4 P K (Na) Mg       | N4 P K Mg                   |
| 10N2     | 10   | N2                                | N2                   | N2                          |
| 11N2P    | 11   | N2 P                              | N2 P                 | N2 P                        |
| 12N2PNA  | 12   | N2 P Na                           | N2 P Na              | N2 P Na                     |
| 13N2PK   | 13   | N2 P K                            | N2 P K               | N2 P K                      |
| 14N2PKMG | 14   | N2 P Mg                           | N2 P K Mg            | N2 P K Mg                   |
| 15N5F    | 15   | N2 P K Na Mg                      | N3 P K (Na) Mg       | N5 P K Mg                   |
| 16N6F    | 16   | N*2 P K Na Mg                     | N2 P K (Na) Mg       | N6 P K Mg                   |
| 17N1+3FH | 17   | N2(A)                             | N2 ½[P K (Na) Mg]    | N1+3 ½[PK Mg] (A)+          |
| 18N0+3FH | 18   | P K Na Mg(A)                      | N2 ½[P K (Na) Mg]    | N0+3 ½[PK Mg] (A)+          |
| 19(C)    | 19   | C                                 | C                    | (C) (since 1989)            |
| 20N2KMG  | 20   | N2 K Na Mg                        | N2 K (Na) Mg         | N2 K Mg                     |

(A) Alternating each year

#### 04/R/BK/1

+ This change since 1980. Treatments shown are those to w. wheat; autumn N alternates. Maize received N3 ½[PK Mg] on both plots 17 and 18. These treatments shown incorrectly in 1999-02 Yield books.

W. oats; Nitrogen and dung were not applied.

N1,N2,N3,N4,N5,N6: 48, 96, 144, 192, 240, 288 kg N as sulphate of ammonia until 1967, except N\* which was nitrate of soda. All as 'Nitro-Chalk' in spring from 1968 to 1985, as 34.5% N since 1986.

N0+3; N1+3: None in autumn + 144 kg N in spring; 48 kg N in autumn + 144 kg N in spring

P: 35 kg P as triple superphosphate in 1974 and since 1988, single superphosphate in other years

K: 90 kg K as sulphate of potash

Na: 55 kg Na as sulphate of soda

(Na): 16 kg Na as sulphate of soda until 1973

Mg: 30 kg Mg annually to Plot 14 (applied at 26 kg 1990 to 2000), 35 kg Mg every third year to other plots since 1974 (applied at 30 kg in 1991, 1994, 1997 and 2000 and at 15 kg on half rate treatments). All as kieserite since 1974, previously as sulphate of magnesia annually

D: Farmyard manure at 35 t

(C): Castor meal to supply 96 kg N until 1988, none since

F: Full rate P K (Na) Mg as above H: Half rate of above

Strips of sub-plots: Until 1967 wheat alone was grown on the experiment, with some bare fallowing. From 1968, ten strips of sub-plots (sections) were started with the following cropping:-

#### SECTION

| Section | 1 | 9 | 0* | 8+ | 6** | 5 | 3 | 7  | 4  | 2  |
|---------|---|---|----|----|-----|---|---|----|----|----|
| Year    |   |   |    |    |     |   |   |    |    |    |
| 1968    | W | W | W  | W  | F   | W | W | P  | W  | BE |
| 1969    | W | W | W  | W  | W   | F | W | BE | P  | W  |
| 1970    | W | W | W  | W  | W   | W | F | W  | BE | P  |
| 1971    | W | W | W  | W  | F   | W | W | P  | W  | BE |
| 1972    | W | W | W  | F  | W   | F | W | BE | P  | W  |
| 1973    | W | W | W  | W  | W   | W | F | W  | BE | P  |
| 1974    | W | W | W  | W  | F   | W | W | P  | W  | BE |
| 1975    | W | W | W  | W  | W   | F | W | BE | P  | W  |
| 1976    | W | W | W  | W  | W   | W | F | W  | BE | P  |
| 1977    | W | W | W  | W  | F   | W | W | P  | W  | BE |
| 1978    | W | W | W  | W  | W   | F | W | BE | P  | W  |
| 1979    | W | W | W  | W  | W   | W | F | W  | P  | F  |
| 1980    | W | W | W  | W  | W   | W | W | F  | W  | P  |
| 1981    | W | W | W  | F  | W   | W | W | P  | F  | W  |
| 1982    | W | W | W  | W  | W   | W | W | W  | P  | F  |
| 1983    | W | W | W  | W  | W   | W | W | F  | W  | P  |
| 1984    | W | W | W  | W  | W   | W | W | P  | F  | W  |
| 1985    | W | W | W  | W  | W   | F | W | W  | P  | W  |
| 1986    | W | W | W  | W  | W   | P | F | W  | W  | W  |
| 1987    | W | W | W  | W  | W   | W | P | W  | W  | F  |
| 1988    | W | W | W  | F  | W   | W | W | F  | W  | P  |

# 04/R/BK/1

## SECTION

| Section | 1 | 9 | 0* | 8+ | 6** | 5 | 3 | 7 | 4 | 2 |
|---------|---|---|----|----|-----|---|---|---|---|---|
| Year    |   |   |    |    |     |   |   |   |   |   |
| 1989    | W | W | W  | W  | W   | W | W | P | F | W |
| 1990    | W | W | W  | W  | W   | F | W | W | P | W |
| 1991    | W | W | W  | W  | W   | P | F | W | W | W |
| 1992    | W | W | W  | W  | W   | W | P | W | W | F |
| 1993    | W | W | W  | W  | W   | W | W | F | W | P |
| 1994    | W | W | W  | F  | W   | W | W | P | F | W |
| 1995    | W | W | W  | W  | W   | F | W | W | P | W |
| 1996    | W | W | W  | W  | W   | P | O | W | W | W |
| 1997    | W | W | W  | W  | W   | W | M | W | W | O |
| 1998    | W | W | W  | W  | W   | W | W | O | W | M |
| 1999    | W | W | W  | W  | W   | W | W | M | O | W |
| 2000    | W | W | W  | W  | W   | O | W | W | M | W |
| 2001    | W | W | W  | F  | W   | M | O | W | W | W |
| 2002    | W | W | W  | W  | W   | W | M | W | W | O |
| 2003    | W | W | F  | W  | W   | W | W | O | W | M |
| 2004    | W | W | F  | W  | W   | W | W | M | O | W |

W = w. wheat, O = w. oats (spring oats 2001), P = potatoes, BE = s. beans, F = fallow, M = forage maize

\* Straw incorporated since autumn 1986. \*\* No sprays except weedkillers since 1985. + No weedkillers.

- NOTES:** (1) For a fuller record of treatments see 'Details' etc.  
(2) From autumn 1975 to autumn 1986, chalk was applied at 2.9 t each autumn to all plots in sets of Sections on a three-year cycle. Year 1: Sections 1,2,3. Year 2: Sections 6,7,8,9. Year 3: Sections 0,4,5. From autumn 1988 until autumn 1992 a five-year cycle was used. Year 1: Sections 1,3. Year 2: Sections 2,8. Year 3: Sections 7,9. Year 4: Sections 4,6. Year 5: Sections 0,5. None applied since autumn 1991.  
(3) In 2003 and 2004 section 0 was used for an experiment (CS/595) investigating different herbicides to control *Equisetum arvense*

## Experimental diary:

All sections:

- 03-Sep-03 Rolled (excluding section 0).  
03-Sep-03 Harvest at 3.0 l in 200 L (excluding section 0 & 8).  
23-Sep-03 K\* Muriate of potash at 181 kg, strip 14.  
P TSP at 170 kg, strips 11, 13, 14, 17, & 18.  
25-Sep-03 FYM FYM at 35.0 tonnes, strips 2.1 & 2.2, not to Section 0 or 4.  
27-Sep-03 Ploughed 25 cm wide furrows, cultipressed, not to section 0.  
29-Sep-03 Cultipressed, not to section 0.  
23-Feb-04 MG Kieserite at 80 kg, strips 5, 6, 7, 8, 9, 11, 15, 16, 17, 18, 19, & 20.  
MG2 Kieserite at 160 kg, strip 12.  
K Sulphate of potash at 217 kg, strips 5, 6, 7, 8, 9, 13, 15, 16, 17, 18, 19 & 20.  
K2 Sulphate of potash at 434 kg, strip 12.  
24-May-04 Rotavate paths.  
22 Jun-04 Rotavate paths.  
29-Jun-04 Power harrowed discards.  
30-Jun-04 Rogued wild oats.  
02-Sep-04 Topped fallow areas.

#### 04/R/BK/1

##### Experimental diary:

##### Cropped sections:

##### Winter wheat

30-Sep-03 Combination drilled, Hereward, tr. Sibutol Secur, at 350 seeds/m<sup>2</sup> with the Accord drill. Rolled.

05-Dec-03 tm)Lexus Class WSB at 60 g in 200 l, excluding section 8.  
tm)Hallmark with Zeon Technology at 50 ml in 200 l, excluding section 8.

18-Dec-03 Arelon 500 at 3.5 l in 200 l, excluding section 8.

09-Apr-04 tm)Topik at 3.5 l in 200 l, excluding section 8.  
tm)Amber at 0.5 l in 200 l, excluding section 8.

17-Mar-04 1<sup>st</sup> split N applied.

06-May-04 tm)Ally at 30 g in 200 l, excluding section 8.  
tm)Starane 2 at 0.7 l in 200 l, excluding section 8.

07-May-04 Main N and 2<sup>nd</sup> split N applied.

13-May-04 Landmark at 1.0 l in 200 l, excluding Section 6.

25-May-04 3<sup>rd</sup> split N applied.

10-Jun-04 tm)Opera at 1.0 l in 200 l, excluding Section 6.  
tm)Hallmark with Zeon Technology at 50 ml in 200 l, excluding section 6.

16-Aug-04 Combine harvested discards, swathed straw.

02-Sep-04 Combine harvested plots for yield. Swathed straw. (except section 8).  
Combine harvested discards, swathed straw.

03-Sep-04 Combine harvested section 8. (Wheat badly laid, not all plots harvested).  
Sampled and weighed straw.  
Combine harvested discards.

04-Sep-04 Baled straw.

##### W. oats

30-Sep-03 Combination drilled, Gerald, tr. Sibutol Secur, at 350 seeds/m<sup>2</sup> with the Accord drill. Rolled.

05-Dec-03 tm)Lexus Class WSB at 60 g in 200 l.  
tm)Hallmark with Zeon technology at 50 ml in 200 l.

06-May-04 tm)Ally at 30 g in 200 l  
tm)Starane 2 at 0.7 l in 200 l

13-May-04 Landmark at 1.0 l in 200 l.

03-Sep-04 Combine harvested discards, swathed straw.  
Combine harvested plots for yield. Swathed straw.  
Sampled and weighed straw.

04-Sep-04 Baled straw.

##### Forage maize

09-Apr-04 Glydate at 3.0 l in 200 l.

13-May-03 Main N and 1<sup>st</sup> split N applied.

14-May-04 Flexitined.

19-May-04 Power harrowed.

20-May-04 Drilled, Hudson, tr. Mesurool at 10.2 seeds/m<sup>2</sup>, with the Nodet Gougis drill.

17-Jun-04 2<sup>nd</sup> split N applied.

22-Jun-04 Samson at 1.5 l in 200 l.

20-Sep-04 Cut sample areas by hand, weighed, and sampled.

21-Sep-04 Cleared maize.

##### Section 0

06-Jul-04 Weedazol-TL at 30 l in 200 l to plots not being used for CS/595 Control of Equisetum.

06-Jul-04 Treatments applied to CS/595.

09-Sep-04 Treatments applied to CS/595.

**NOTE:** Straw on Section 0 was baled and removed at harvest 2002 (usually incorporated) as this section will remain unploughed to test control of *Equisetum*. Samples of wheat and oat grain and straw, and forage maize were taken for chemical analysis. Unground wheat grain and straw and maize samples from selected treatments were archived.

04/R/BK/1

WHEAT

GRAIN TONNES/HECTARE

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

| SECTION<br>PLOT     | 2/W1 | 3/W2 | 5/W3 | 8/W3 | 6/W27 | 1/W38 | 9/W46 |
|---------------------|------|------|------|------|-------|-------|-------|
| 01 (FYM) N4         | 9.20 | 7.33 | 6.84 | *    | 7.25  | *     | *     |
| 21 FYMN2            | 9.06 | 7.30 | 7.06 | nh   | 6.92  | 6.09  | 5.93  |
| 22 FYM              | 6.44 | 4.40 | 4.17 | nh   | 4.38  | 4.04  | 4.29  |
| 03 Nil              | 1.29 | 1.09 | 1.27 | 0.52 | 1.26  | 0.71  | 0.13  |
| 05 (P) KMg          | 1.52 | 1.47 | 0.97 | 0.82 | 1.29  | 1.11  | 0.85  |
| 06 N1 (P) KMg       | 3.76 | 2.85 | 2.23 | 1.32 | 2.84  | 2.83  | 2.73  |
| 07 N2 (P) KMg       | 5.61 | 4.25 | 2.85 | 1.75 | 3.84  | 4.09  | 3.72  |
| 08 N3 (P) KMg       | 7.35 | 4.73 | 2.57 | 1.32 | 3.73  | 4.50  | 4.17  |
| 09 N4 (P) KMg       | 8.35 | 6.54 | 5.50 | 2.04 | 6.03  | 5.78  | 5.82  |
| 10 N4               | 5.45 | 2.35 | 4.10 | 0.68 | 0.79  | 2.26  | 0.12  |
| 11 N4 PMg           | 6.98 | 5.23 | 4.33 | 1.44 | 5.22  | 4.86  | 5.07  |
| 12 N1+3+1 (P) K2Mg2 | 8.05 | 7.02 | 6.17 | 0.90 | 7.68  | 5.78  | 6.08  |
| 13 N4 PK            | 7.25 | 5.85 | 3.28 | 1.64 | 6.32  | 5.17  | 3.91  |
| 14 N4 PK* (Mg*)     | 7.05 | 5.47 | 3.36 | 1.60 | 6.44  | 5.17  | 4.88  |
| 15 N5 (P) KMg       | 8.62 | 5.95 | 4.02 | 1.09 | 5.61  | 3.43  | 4.29  |
| 16 N6 (P) KMg       | 8.45 | 6.68 | 6.47 | 1.50 | 7.45  | 6.43  | 6.92  |
| 17 N1+4+1 PKMg      | 8.80 | 7.94 | 7.23 | nh   | 8.06  | 6.06  | 7.37  |
| 18 N1+2+1 PKMg      | 8.08 | 6.61 | 6.72 | nh   | 7.12  | 5.27  | 6.23  |
| 19 N1+1+1 KMg       | 6.74 | 5.67 | 5.03 | nh   | 4.62  | 4.03  | 3.93  |
| 20 N4 KMg           | *    | *    | *    | *    | *     | 1.86  | *     |

GRAIN MEAN DM% 87.2

STRAW TONNES/HECTARE

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

| SECTION<br>PLOT     | 2/W1 | 8/W3 | 1/W38 |
|---------------------|------|------|-------|
| 01 (FYM) N4         | 3.71 | *    | *     |
| 21 FYMN2            | 4.71 | nh   | 2.62  |
| 22 FYM              | 3.45 | nh   | 2.35  |
| 03 Nil              | 0.25 | 0.17 | 0.11  |
| 05 (P) KMg          | 0.52 | 1.02 | 0.28  |
| 06 N1 (P) KMg       | 1.37 | 1.62 | 1.50  |
| 07 N2 (P) KMg       | 1.78 | 2.23 | 1.32  |
| 08 N3 (P) KMg       | 2.45 | 1.60 | 1.60  |
| 09 N4 (P) KMg       | 3.19 | 3.45 | 2.02  |
| 10 N4               | 1.88 | 0.99 | 1.14  |
| 11 N4 PMg           | 1.95 | 2.49 | 1.88  |
| 12 N1+3+1 (P) K2Mg2 | 3.74 | 2.94 | 3.28  |
| 13 N4 PK            | 2.72 | 2.48 | 1.93  |
| 14 N4 PK* (Mg*)     | 2.48 | 2.97 | 2.01  |
| 15 N5 (P) KMg       | 3.15 | 2.78 | 1.38  |
| 16 N6 (P) KMg       | 2.92 | 5.98 | 2.73  |
| 17 N1+4+1 PKMg      | 3.89 | nh   | 3.44  |
| 18 N1+2+1 PKMg      | 3.75 | nh   | 2.83  |
| 19 N1+1+1 KMg       | 2.83 | nh   | 2.71  |
| 20 N4 KMg           | *    | *    | 0.48  |

STRAW MEAN DM% 89.2

Note: nh = not harvested

04/R/BK/1

W. OATS

GRAIN TONNES/HECTARE

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

| PLOT              | GRAIN | STRAW |
|-------------------|-------|-------|
| 01 (FYM) [N4]     | 6.07  | 2.80  |
| 21 [FYMN2]        | 6.52  | 3.38  |
| 22 [FYM]          | 6.69  | 3.11  |
| 03 Nil            | 1.75  | 0.29  |
| 05 (P) KMg        | 2.37  | 0.34  |
| 06 [N1] (P) KMg   | 3.06  | 0.71  |
| 07 [N2] (P) KMg   | 3.48  | 0.89  |
| 08 [N3] (P) KMg   | 3.80  | 0.91  |
| 09 [N4] (P) KMg   | 4.03  | 1.27  |
| 10 [N4]           | 4.64  | 1.65  |
| 11 [N4] PMg       | 5.41  | 2.02  |
| 12 [N2] (P) K2Mg2 | 4.75  | 1.51  |
| 13 [N4] PK        | 4.41  | 1.45  |
| 14 [N4] PK* (Mg*) | 4.43  | 1.37  |
| 15 [N5] (P) KMg   | 5.55  | 2.24  |
| 16 [N6] (P) KMg   | 6.12  | 2.65  |
| 17 [N1+4+1] PKMg  | 5.77  | 2.43  |
| 18 [N1+2+1] PKMg  | 4.09  | 1.23  |
| 19 [N1+1+1] KMg   | 3.47  | 0.98  |
| MEAN DM%          | 85.5  | 91.7  |

FORAGE MAIZE

WHOLE CROP (100% DM) TONNES/HECTARE

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

| PLOT              | WHOLE CROP |
|-------------------|------------|
| 01 (FYM) N4       | 23.13      |
| 21 FYMN2          | 17.55      |
| 22 FYM            | 16.78      |
| 03 Nil            | 1.56       |
| 05 (P) KMg        | 0.97       |
| 06 N1 (P) KMg     | 3.27       |
| 07 N2 (P) KMg     | 11.97      |
| 08 N3 (P) KMg     | 15.13      |
| 09 N4 (P) KMg     | 16.12      |
| 10 N4             | 5.33       |
| 11 N4 PMg         | 9.31       |
| 12 N2+3 (P) K2Mg2 | 13.67      |
| 13 N4 PK          | 13.65      |
| 14 N4 PK* (Mg*)   | 13.76      |
| 15 N5 (P) KMg     | 13.67      |
| 16 N6 (P) KMg     | 13.60      |
| 17 N2+4 PKMg      | 13.00      |
| 18 N2+2 PKMg      | 16.89      |
| 19 N2+1 KMg       | 5.86       |
| CROP MEAN DM%     | 27.5       |