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# Numerical Results of the Field Experiments 1968

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## 68/C/1 K, Mg and Na - Grass

### Rothamsted Research

Rothamsted Research (1970) *68/C/1 K, Mg and Na - Grass* ; Numerical Results Of The Field Experiments 1968, pp 125 - 135 - DOI: <https://doi.org/10.23637/ERADOC-1-58>

68/C/1.1

K, MG AND NA

(IM)

K, Mg and Na - Rothamsted Sawyers I - the 10th year, grass.

Design: 3 x 3 x 3 arrangement in 6 blocks of 9 plots, with 3 blocks (1 replicate) at each of 2 levels of Ca.

In addition a 3 x 3 arrangement in 2 blocks of 9 (1 at each level of Ca).

Area of each plot: 0.0209. Area harvested: 0.0050.

Treatments (applied 1959 - 1967):

Blocks receiving sodium treatments. All combinations of:-

1. (To blocks). Magnesium-free calcium carbonate in 1959 and 1962 as follows:

10 cwt in 1959, 38 cwt in 1962 (Ca1).

40 cwt in 1959, 76 cwt in 1962 (Ca2).

2. Mg applied each year: None (Mg0), 29 (Mg1), 58 (Mg2) lb Mg applied as magnesium sulphate.

3. K applied each year: (in lb K, as sulphate of potash). None (K0), 68 (K1), 136 (K2).

4. Na (1966 and 1967 only): None (Na0), 130 lb Na as sodium chloride (NaCl), 130 lb as sodium carbonate (NaC).

Blocks not receiving sodium treatments. All combinations of (1), (2), (3) above.

Basal applications: 0.5 cwt P<sub>2</sub>O<sub>5</sub> as triple superphosphate in seedbed, 0.5 cwt N as 'Nitro-Chalk' in seedbed, 1.0 cwt N as 'Nitro-Chalk' for each cut.

Cultivations, etc.: Ploughed: 12 Sept, 1967. Basal N and P applied: 13 Sept. Rotary cultivated: 14 Sept. Seed drilled at 40 lb: 20 Sept. 'Nitro-Chalk' applied: 26 Mar, 1968. Cut 4 times: 22 May, 2 July, 14 Aug, 4 Nov. 'Nitro-Chalk' applied after first 3 cuts. Variety: S22 Italian Ryegrass.

NOTES: (1) The percentages of Na, Mg and K in the crop were determined.

(2) For previous years' results see 'Results' 60/C/3, 61/C/7, 62/C/6, 63/C/1, 64/C/1, 65/C/1, 66/C/1, 67/C/1.

Standard errors per plot. Dry matter:

1st cut: 1.73 or 3.4% (34 d.f.)

2nd cut: 1.68 or 4.7% (34 d.f.)

3rd cut: 1.81 or 7.0% (34 d.f.)

4th cut: 1.84 or 11.9% (34 d.f.)

Total of 4 cuts: 3.63 or 2.8% (34 d.f.)



68/C/1.3

BLOCKS RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	NaO	NaCl	NaC	Mean
2ND CUT										
Ca1	35.3	35.8	36.3	33.4	36.5	37.6	35.7	35.8	36.0	35.8
Ca2	36.3	36.8	35.7	35.0	37.4	36.3	36.0	36.3	36.5	36.2
Mean ( $\pm 0.40$ )	35.8	36.3	36.0	34.2	36.9	37.0	35.8	36.0	36.2	36.0
	KO	K1	K2	NaO	NaCl	NaC	NaO	NaCl	NaC	
MgO	34.2	36.2	37.1	35.5	35.7	36.3	KO	34.6	( $\pm 0.69$ )	34.0
Mg1	34.4	37.0	37.5	37.0	35.7	36.2	K1	36.8	34.1	37.8
Mg2	34.1	37.5	36.3	35.0	36.8	36.1	K2	36.2	36.2	36.8

\* For use in horizontal and interaction comparisons

Mean D.M. % (all plots): 20.8



68/c/1.4

BLOCKS RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	NaO	NaCl	NaC	Mean
3RD CUT										
Ca1	24.5	26.0	25.7	23.2	26.9	26.1	24.5	26.0	25.7	25.4
Ca2	26.1	25.9	26.4	23.2	26.8	28.4	26.0	25.8	26.6	26.1
					(±0.60)*					
Mean (±0.43)	25.3	26.0	26.0	23.2	26.8	27.3	25.3	25.9	26.2	25.8
-----										
	KO	K1	K2	NaO	NaCl	NaC	NaO	NaCl	NaC	
MgO	23.4	(±0.74)	26.5	24.8	(±0.74)	26.0		(±0.74)	23.4	
Mg1	23.2	26.0	27.2	25.4	25.0	26.1	K0	22.8	23.3	23.4
Mg2	23.0	27.4	28.0	25.6	26.4	26.4	K1	26.0	27.4	27.1
		27.1			26.2	26.4	K2	27.0	26.9	27.9

\* For use in horizontal and interaction comparisons

Mean D.M. % (all plots): 14.9





68/C/1.7

BLOCKS NOT RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	K0	K1	K2	Mean
Ca1	49.8	(±1.00)*	51.2	46.7	(±1.00)*	51.7	50.8
	47.4	47.2	47.8	43.9	53.8	49.7	47.5
Ca2				45.9	(±1.22)	50.0	(±0.71)
		MgO		45.6	49.8	50.0	48.6
		Mg1		44.5	52.1	52.2	49.2
		Mg2					49.5
		Mean (±0.71)		45.3	51.3	50.7	49.1

\* For use in horizontal and interaction comparisons



68/c/1.8

BLOCKS NOT RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	K0	K1	K2	Mean
	2ND CUT						
Ca1	34.6	(±0.97)*	34.8	32.5	(±0.97)*	35.7	35.1
Ca2	35.9	37.0	35.1	34.0	36.4	37.6	36.0
					(±1.19)		(±0.69)
	MgO			33.9	35.9	36.0	35.3
	Mg1			33.8	37.3	38.1	36.4
	Mg2			32.0	36.9	35.9	34.9
	Mean (±0.69)			33.3	36.7	36.6	35.5

\* For use in horizontal and interaction comparisons

68/C/1.9

BLOCKS NOT RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	Mean
		3RD CUT					
Ca1	24.5	(±1.05)*	24.2	21.1	(±1.05)*	26.8	24.2
Ca2	26.0	24.0	26.6	22.4	24.7	29.3	26.5
		26.9			27.8		
					(±1.28)		(±0.74)
		MgO		21.2	25.6	29.0	25.3
		Mg1		22.7	26.1	27.6	25.4
		Mg2		21.5	27.1	27.7	25.4
		Mean (±0.74)		21.8	26.3	28.1	25.4

\* For use in horizontal and interaction comparisons

68/c/1.10

BLOCKS NOT RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	Mean
	4TH CUT						
Ca1	15.8	(±1.06)* 14.1	12.9	11.1	(±1.06)* 16.2	15.5	14.3
Ca2	12.6	14.3	13.3	11.8	13.9	14.5	13.4
					(±1.30)		(±0.75)
		MgO		11.9	15.5	15.3	14.2
		Mg1		11.8	15.7	15.0	14.2
		Mg2		10.6	14.1	14.7	13.1
		Mean (±0.75)		11.4	15.1	15.0	13.8

\* For use in horizontal and interaction comparisons

Ca1  
Ca2

MgO  
Mg1  
Mg2

KO  
K1  
K2

Mean

68/C/1.11

BLOCKS NOT RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	Mean
	TOTAL OF 4 CUTS						
		(±2.10)*			(±2.10)*		
Ca1	124.7	125.2	123.1	111.4	131.8	129.8	124.3
Ca2	122.0	125.4	122.9	112.1	127.0	131.1	123.4
	MgO			112.9	(±2.57)		(±1.48)
	Mg1			113.9	126.9	130.3	123.3
	Mg2			108.5	131.2	130.7	125.3
					130.1	130.5	123.0
	Mean (±1.48)			111.8	129.4	130.5	123.9

\* For use in horizontal and interaction comparisons