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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

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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 P₂O₅ 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/ci/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/1.2

SUMMARY OF RESULTS
BLOCKS RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	NaO	NaCl	NaC	Mean
1ST CUT										
Ca1 Ca2	51.0	50.8	51.3	48.6	(± 0.58)*	52.7	51.2	51.9	50.1	51.0
	51.1	51.2	50.5	47.6	51.8 52.3	52.9	49.8	51.6	51.4	50.9
Mean (± 0.41)	51.0	51.0	50.9	48.1	52.1	52.8	50.5	51.7	50.8	51.0
2ND CUT										
MgO Mg1 Mg2	48.0	(± 0.71)	52.6	49.8	(± 0.71)	51.4	KO	47.8	(± 0.71)	47.7
	48.6	52.5	52.6	51.0	51.9	50.4	K1	51.8	48.8	51.8
	47.7	51.9	53.2	50.6	51.6	50.4	K2	51.9	52.6	52.6
		51.8			51.6				53.8	

* For use in horizontal and interaction comparisons

Mean D.M. % (all plots): 16.0

68/c/1.3

BLOCKS RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	NaO	NaCl	NaC	Mean
2ND CUT										
				(± 0.56)*						
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 (± 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	(± 0.69)	37.1	35.5	(± 0.69)	36.3	KO	34.6	(± 0.69)	34.0
Mg1	34.4	36.2	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	37.8	36.8

* For use in horizontal and interaction comparisons

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

DRY MATTER

* For use in horizontal and interaction comparisons

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

DRY MATTER

* For use in horizontal and interaction comparisons

Mean D.M. % (all plots): 15.8

68/c/1.6

BLOCKS RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	KO	K1	K2	NaO	NaCl	NaC	Mean
				TOTAL OF 4 CUTS						
				(± 1.21)*						
Ca1	126.5	127.3	129.2	118.0	131.9	133.0	126.2	130.0	126.8	127.6
Ca2	130.1	130.2	128.9	119.4	134.6	135.2	128.3	130.1	130.8	129.7
Mean (± 0.86)	128.3	128.7	129.0	118.7	133.2	134.1	127.3	130.1	128.8	128.7
	KO	K1	K2	NaO	NaCl	NaC	NaO	NaCl	NaC	
	(± 1.48)				(± 1.48)					
MgO	119.4	132.4	133.2	126.2	129.6	129.0	KO	118.4	(± 1.48)	117.4
Mg1	119.6	133.4	133.2	128.8	129.8	127.6	K1	131.6	120.4	134.4
Mg2	117.3	133.9	135.8	126.7	130.8	129.7	K2	131.8	133.7	134.4

* For use in horizontal and interaction comparisons

Mean D.M. % (all plots): 16.9

68/c/1.7

BLOCKS NOT RECEIVING SODIUM TREATMENTS

DRY MATTER

	MgO	Mg1	Mg2	K0	K1	K2	Mean
Cal Ca2	1ST CUT						
	(±1.00)*						
	49.8	51.3	51.2	46.7	(±1.00)* 53.8	51.7	50.8
	47.4	47.2	47.8	43.9	48.9	49.7	47.5
	(±1.22)						(±0.71)
	MgO						48.6
	Mg1						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	26.8	26.5
		26.9			27.8	29.3	
					(± 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)*	12.9	11.1	(± 1.06)*	15.5	14.3
Ca2	12.6	14.1	13.3	11.8	16.2	14.5	13.4
		14.3			13.9		(± 0.75)
					(± 1.30)		
	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)						13.8

* For use in horizontal and interaction comparisons

DRY MATTER

* For use in horizontal and interaction comparisons