ROTHAMSTED RESEARCH

Yields of the Field Experiments 1967

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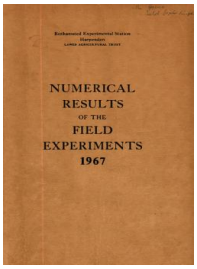

67/R/EAT/C/33 N and 67/W/WEAQ/C/33 N - Fixation - Lucerne and Grass

Rothamsted Research

Rothamsted Research (1968) *67/R/EAT/C/33 N and 67/W/WEAQ/C/33 N - Fixation - Lucerne and Grass ;* Yields Of The Field Experiments 1967, pp 227 - 236 **- DOI: https://doi.org/10.23637/ERADOC-1-157**

67/C/33.1

N FIXATION - LUCERNE AND GRASS

(EAT and WEAQ)

Nitrogen fixation by lucerne - Rothamsted (R) Stackyard and Woburn (W) Stackyard C 1967, the first year.

Design: 4 blocks of four plots split into four for minerals and nitrogen.

Area of each sub-plot: 0.0011. Area harvested: 0.0006.

Treatments: All combinations of:-

Whole plots: 1. Seed: Lucerne uninoculated (O), lucerne with ineffective inoculum (I), lucerne with effective inoculum 2001 (E), Italian ryegrass (G).

Sub-plots: 2. Minerals: Unmanured (U), 0.6 cwt P_2O_5, 1.2 cwt K_2O as compound fertiliser (0:14:28), plus 4 tons of ground chalk (5 tons on Stackyard C (W)) (M).

3. Nitrogen (as 'Nitro-Chalk'): None (N0), 60 lb N* before the first cut (N1), 60 lb N* before the first cut, 60 lb after the first cut (N2), 60 lb N* before the first cut, 60 lb after the first cut, 60 lb after the second cut (N3).

*30 lb in the seedbed, 30 lb in June.

Basal applications: None.

Cultivations, etc.:-

Stackyard (R): Ploughed: Nov 16, 1966. PK, ground chalk and seedbed 'Nitro-Chalk' applied, plots rotary cultivated, seed drilled, lucerne at 12 lb, ryegrass at 30 lb: Apr 26, 1967. 'Nitro-Chalk' applied: June 27. Cut three times: June 24, Aug 29, Oct 25. Appropriate 'Nitro-Chalk' dressings applied after first two cuts. Varieties: Lucerne - Du Puits, ryegrass S22. Previous crops: Barley 1965, barley 1966.

Stackyard C (W): Ploughed: Oct 28, 1966. PK, ground chalk and seedbed 'Nitro-Chalk' applied, plots rotary cultivated, seed drilled, lucerne at 12 lb, ryegrass at 30 lb: Apr 27. 'Nitro-Chalk' applied: June 28. Cut three times: July 26, Sept 4, Oct 24. Appropriate 'Nitro-Chalk' dressings applied after first two cuts. Varieties: Lucerne - Du Puits, ryegrass S22. Previous crops: Fallow 1965 and 1966.

NOTE: Soil samples were taken to determine pH before sowing. Rhizobium counts were taken from root samples on each experiment.

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Standard errors per plot. Dry matter:

Stackyard (R):	1st cut:	Whole plot:	3.58 or 25.0% (6 d.f.)
		Sub plot:	2.20 or 15.4% (24 d.f.)
	2nd cut:	Whole plot:	2.06 or 10.9% (6 d.f.)
		Sub plot:	2.77 or 14.6% (24 d.f.)
	3rd cut:	Whole plot:	0.42 or 7.8% (6 d.f.)
		Sub plot:	1.91 or 35.3% (24 d.f.)
	Total of 3 cuts:	Whole plot:	4.81 or 12.5% (6 d.f.)
		Sub plot:	4.87 or 12.6% (24 d.f.)
Stackyard C (W):	1st cut:	Whole plot:	5.36 or 32.4% (6 d.f.)
		Sub plot:	4.38 or 26.5% (24 d.f.)
	2nd cut:	Whole plot:	2.74 or 20.7% (6 d.f.)
		Sub plot:	2.68 or 20.2% (24 d.f.)
	3rd cut:	Whole plot:	3.15 or 43.5% (6 d.f.)
		Sub plot:	1.60 or 22.1% (24 d.f.)
	Total of 3 cuts:	Whole plot:	9.01 or 24.3% (6 d.f.)
		Sub plot:	7.65 or 20.7% (24 d.f.)

67/C/33.3

SUMMARY OF RESULTS

DRY MATTER

	O	I	E	G	Mean
STACKYARD (R)					
1ST CUT					
Mean (±1.79)	8.8	5.6	20.4	22.4	14.3
		(1) and (2)			(±0.39)
U	7.6	5.1	17.4	22.0	13.0
M	10.1	6.1	23.4	22.8	15.6
		(3) and (4)			(±0.55)
N0	7.0	3.6	19.7	11.4	10.4
N1	9.1	7.1	20.0	26.2	15.6
N2	8.8	6.6	21.7	24.5	15.4
N3	10.3	5.1	20.1	27.5	15.8

Mean D.M. %: 27.8

(1) (±1.87) (3) (±2.03) For use in horizontal and diagonal comparisons only
(2) (±0.78) (4) (±1.10) For use in vertical and interaction comparisons only

NOTE: 1st cut N1 = N2 = N3

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DRY MATTER

	O	I	E	G	Mean
		STACKYARD (R)			
		2ND CUT			
Mean (±1.03)	20.3	16.0	24.3	15.0	18.9
		(1) and (2)			(±0.49)
U	18.4	14.4	21.7	15.7	17.6
M	22.2	17.5	26.8	14.3	20.2
		(3) and (4)			(±0.69)
NO	15.4	6.9	23.0	4.5	12.5
N1	18.7	14.2	23.2	7.9	16.0
N2	23.6	21.9	25.2	24.7	23.9
N3	23.4	20.8	25.7	22.8	23.2

Mean D.M. %: 19.7

(1) (±1.24) (3) (±1.58) For use in horizontal and diagonal comparisons only
(2) (±0.98) (4) (±1.38) For use in vertical and interaction comparisons only

NOTE: 2nd cut N2 = N3

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67/C/33.5

DRY MATTER

	O	I	E	G	Mean
		STACKYARD (R)			
		3RD CUT			
Mean (±0.21)	6.6	4.5	6.6	4.0	5.4
		(1) and (2)			(±0.34)
U	5.5	4.1	5.7	4.3	4.9
M	7.7	4.9	7.5	3.7	5.9
		(3) and (4)			(±0.48)
NO	6.2	3.8	7.7	1.6	4.8
N1	5.1	3.6	6.3	1.7	4.2
N2	6.7	3.5	5.9	3.2	4.8
N3	8.3	7.0	6.6	9.4	7.8

Mean D.M. %: 20.9

(1) (±0.52) (3) (±0.85) For use in horizontal and diagonal comparisons only
(2) (±0.68) (4) (±0.95) For use in vertical and interaction comparisons only

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67/C/33.6

DRY MATTER

	O	I	E	G	Mean
STACKYARD (R)					
TOTAL OF 3 CUTS					
Mean (±2.40)	35.7	26.0	51.3	41.4	38.6
		(1) and (2)			(±0.86)
U	31.4	23.6	44.8	42.0	35.4
M	40.0	28.4	57.8	40.8	41.7
		(3) and (4)			(±1.22)
NO	28.7	14.3	50.4	17.5	27.7
N1	32.9	24.9	49.5	35.8	35.8
N2	39.1	32.0	52.7	52.4	44.1
N3	42.1	32.9	52.4	59.8	46.8

Mean D.M. %: 22.8

(1) (±2.69) (3) (±3.20) For use in horizontal and diagonal comparisons only
(2) (±1.72) (4) (±2.43) For use in vertical and interaction comparisons only

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67/C/33.7

DRY MATTER

	O	I	E	G	Mean
		STACKYARD C (W)			
		1ST CUT			
Mean (±1.34)	14.0	13.1	19.0	20.0	16.5
		(1) and (2)			(±0.77)
U	11.9	13.1	16.5	19.9	15.3
M	16.2	13.1	21.5	20.2	17.8
		(3) and (4)			(±1.09)
NO	12.4	8.4	16.9	7.8	11.4
N1	15.8	13.8	21.6	23.4	18.7
N2	12.1	14.7	20.3	25.7	18.2
N3	15.8	15.4	17.3	23.3	17.9

Mean D.M. %: 26.6

(1) (±1.73) (3) (±2.32) For use in horizontal and diagonal comparisons only
(2) (±1.55) (4) (±2.19) For use in vertical and interaction comparisons only

NOTE: 1st cut N1 = N2 = N3

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67/C/33.8

DRY MATTER

	O	I	E	G	Mean
STACKYARD C (W)					
2ND CUT					
Mean (±0.68)	14.0	12.7	16.6	9.7	13.2
		(1) and (2)			(±0.47)
U	12.1	11.7	14.6	9.3	11.9
M	15.9	13.7	18.7	10.1	14.6
		(3) and (4)			(±0.67)
N0	12.4	9.2	13.9	2.6	9.5
N1	14.6	10.2	17.2	4.5	11.7
N2	14.4	16.2	18.3	15.2	16.0
N3	14.5	15.2	17.1	16.3	15.8

Mean D.M. %: 26.2

(1) (±0.96) (3) (±1.35) For use in horizontal and diagonal comparisons only
(2) (±0.95) (4) (±1.34) For use in vertical and interaction comparisons only

NOTE: 2nd cut N2 = N3

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67/C/33.9

DRY MATTER

	O	I	E	G	Mean
		STACKYARD C (W)			
		3RD CUT			
Mean (±0.79)	8.3	6.5	8.7	5.5	7.2
		(1) and (2)			(±0.28)
U	7.2	5.4	8.3	5.3	6.5
M	9.4	7.5	9.2	5.7	7.9
		(3) and (4)			(±0.40)
NO	6.8	5.4	7.5	1.2	5.2
N1	8.8	4.9	9.0	1.7	6.1
N2	7.7	7.2	9.2	3.7	6.9
N3	9.9	8.4	9.2	15.3	10.7

Mean D.M. %: 19.9

(1) (±0.88) (3) (±1.05) For use in horizontal and diagonal comparisons only
(2) (±0.57) (4) (±0.80) For use in vertical and interaction comparisons only

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67/C/33.10

DRY MATTER

	C	I	E	G	Mean
		STACKYARD C (W)			
		TOTAL OF 3 CUTS			
Mean (±2.25)	36.3	32.2	44.4	35.2	37.0
		(1) and (2)			(±1.35)
U	31.2	30.2	39.3	34.4	33.8
M	41.5	34.3	49.4	35.9	40.3
		(3) and (4)			(±1.91)
NO	31.7	23.0	38.3	11.5	26.1
N1	39.3	29.0	47.8	29.6	36.4
N2	34.2	38.1	47.8	44.6	41.2
N3	40.1	38.9	43.5	54.9	44.4

Mean D.M. %: 24.2

(1) (±2.95) (3) (±4.01) For use in horizontal and diagonal comparisons only
(2) (±2.71) (4) (±3.83) For use in vertical and interaction comparisons only