ROTHAMSTED RESEARCH

Yields of the Field Experiments 1964

Full Table of Content

Rotation Experiments

Rothamsted Research

Rothamsted Research (1965) *Rotation Experiments ;* Yields Of The Field Experiments 1964, pp 41 - 136 **- DOI: https://doi.org/10.23637/ERADOC-1-160**

LEY AND ARABLE ROTATIONS

(HLA and FLA)

Highfield and Fosters Field 1964, the 16th year.

For details of treatments, rotations etc., see 'Details'.

Winter wheat: The rates of N following the arable rotation are now increased as follows:-
Highfield: None, 0.4, 0.8, 1.2 cwt N.
Fosters: None, 0.53, 1.07, 1.60 cwt N.
No weedkiller was applied in 1964.

Barley: Variety is now Maris Badger.

Sugar beet: A test is now made of 1.0 v 1.5 cwt N applied to 1/4 plots as basal 10:10:10 and 'Nitro-Chalk'.

All-grass ley: The seeds mixture is now 5 lb Timothy and 6 lb Meadow Fescue sown at 30 lb, starting with the 1st year ley in 1964.

Lucerne: The second and third year crops are now sprayed with basal paraquat.

Potatoes: In 1964 and future years once grown chitted seed is used.

NOTE: The 3rd year all-grass ley on Fosters failed in spring 1964 and was resown with Italian Ryegrass.

Cultivations, etc.:

HIGHFIELD

1st year Treatment Crops.

All-grass ley. Ploughed twice: Sept 12 and Nov 28, 1963. Basal PK compound applied: Apr 14, 1964. 'Nitro-Chalk' applied: Apr 27. Seeds sown at 30 lb: May 6. Sprayed with 2,4-D butoxyethylester at 0.44 lb a.e. in 40 gals: June 10. Cut twice: July 22 and Oct 22. NK compound applied after first cut.

Clover-grass ley. Ploughed twice: Sept 12 and Nov 28, 1963. Basal PK compound applied: Apr 14, 1964. Seeds sown at 33 lb: May 6. Sprayed with MCPB/MCPA (New Legumex at 2.5 pints in 40 gals): June 10. Cut twice: July 23 and Oct 22. Muriate of potash applied after first cut.

Lucerne. Ploughed twice: Sept 12 and Nov 28, 1963. Basal PK compound applied, seed drilled at 20 lb: Apr 14, 1964. Cut twice: July 21 and Sept 4.

Hay. Seeds undersown in barley: May 6, 1963. Basal NPK compound applied: Feb 26, 1964. Cut twice: May 26 and July 23. NK compound applied after first cut.

2nd year Treatment Crops.

All-grass ley. Basal PK compound applied: Nov 27, 1963. 'Nitro-

Chalk' applied: Mar 20, 1964. Cut four times: May 21, June 24, July 22, Oct 22. NK compound applied after first 3 cuts.

Clover-grass ley. Basal PK compound applied: Nov 27, 1963. Cut three times: May 21, June 24, July 23, 1964. Muriate of potash applied after each cut. Topped with mower: Oct 27.

Lucerne. Basal PK compound applied: Nov 27, 1963. Sprayed with paraquat at 2 lb ion in 40 gals: Feb 12, 1964. Cut three times: June 11, July 21, Sept 4.

Sugar beet. Ploughed three times: Aug 20, Oct 12 and Nov 27, 1963. Muriate of potash applied: Feb 21, 1964. Basal NPK compound applied: Apr 3. 'Nitro-Chalk' applied: Apr 7. Seed drilled at 5.25 lb: Apr 9. Springtine cultivated up, because of failure of 1st sowing, re-drilled at 5.25 lb: May 7. Sprayed with DDT at 0.6 lb in 30 gals: May 27. Singled: June 10. Sprayed twice with menazon (Saphicol at 0.75 pints in 35 gals): July 2 and 23. Lifted: Nov 9.

3rd year Treatment Crops.

All-grass ley. Basal PK compound applied: Nov 27, 1963. 'Nitro-Chalk' applied: Mar 20, 1964. Cut four times: May 21, June 24, July 22, Sept 7. NK compound applied after first 3 cuts.

Clover-grass ley. Basal PK compound applied: Nov 27, 1963. Cut four times: May 21, June 24, July 23, Sept 7, 1964. Muriate of potash applied after first 3 cuts.

Lucerne. Basal PK compound applied: Nov 27, 1963. Sprayed with paraquat at 2 lb ion in 40 gals: Feb 12, 1964. Cut three times: June 11, July 21, Sept 4.

Oats. Ploughed: Nov 27, 1963. Seed combine drilled at 4 bushels: Mar 6, 1964. Springtine cultivated up, because of failure of 1st sowing: Apr 27. Re-drilled at 4 bushels: Apr 28. Sprayed with dicamba/MCPA (Banlene at 4 pints in 40 gals): May 28. Combine harvested: Sept 1.

1st Test Crop, Wheat.

Ploughed: Sept 21, 1963. Seed combine drilled at 2.75 bushels: Oct 15. 'Nitro-Chalk' applied: Apr 25, 1964. Combine harvested: Aug 26.

2nd Test Crop, Potatoes.

Dung applied, plots ploughed: Oct 2, 1963. Ploughed 2nd time: Nov 27. Fertilisers applied: May 7, 1964. Potatoes machine planted: May 8. Earthed up: June 23. Sprayed twice with mancozeb at 1.2 lb in 35 gals: July 1 and Aug 6. Sprayed with diquat (Reglone at 4 pints in 40 gals): Sept 8. Lifted: Sept 16.

https://doi.org/10.23637/ERADOC-1-160

3rd Test Crop, Barley.
Ground chalk applied: Oct 17, 1963. Additional P and K applied: Nov 14. Ploughed: Nov 27. Seed combine drilled at 2.5 bushels: Feb 15, 1964. 'Nitro-Chalk' applied: Feb 20. Combine harvested: Aug 11.

Permanent grasses. 14th, 15th and 16th experimental years permanent (old) grass, all blocks, 14th, 15th and 16th years reseeded grass, blocks 1, 4, 6, 7, 9 and 12. Ground chalk applied to blocks 6 and 7: Oct 17, 1963. Basal PK compound applied: Nov 27. 'Nitro-Chalk' applied to 'all-grass' half plots: Mar 20, 1964. Cut three times: May 25, June 24 and July 23 ('all-grass'), Aug 4 ('clover-grass'). Muriate of potash and NK compound applied to appropriate half plots after each cut. Topped with mower: Oct 27.

NOTE: One whole plot of permanent (old) grass was ploughed up in error in Autumn 1963 and sown to winter wheat. The plot received 'Nitro-Chalk' at 160 lb on April 27, 1964, and was undersown with grass on May 6.

15th year Reseeded grass, Blocks 5 and 8.
Block 5. Basal PK compound applied: Nov 27, 1963. 'Nitro-Chalk' applied: Mar 20, 1964. Cut for silage: May 26. 2nd dressing of 'Nitro-Chalk' applied: May 29. Grazed 4 circuits: June 22 - Aug 26.
Block 8. Basal PK compound applied: Nov 27, 1963. 'Nitro-Chalk' applied: Mar 20 and July 15, 1964. Grazed: 7 circuits: May 5 - Aug 22.

FOSTERS

1st year Treatment Crops.
All-grass ley. Ploughed twice: Sept 12 and Nov 28, 1963. Basal PK compound applied: Apr 14, 1964. 'Nitro-Chalk' applied: Apr 15. Seed sown at 30 lb: May 6. Sprayed with 2,4-D butoxyethylester at 0.44 lb a.e. in 40 gals: June 10. Cut twice: July 22, Oct 20. NK compound applied after first cut.
Clover-grass ley. Ploughed twice: Sept 12 and Nov 28, 1963. Basal PK compound applied: Apr 14, 1964. Seed sown at 33 lb: Apr 6. Sprayed with MCPB/MCPA (New Legumex at 2.5 pints in 40 gals): June 10. Cut once: July 23. Muriate of potash applied: July 28. Topped with mower: Oct 27.
Lucerne. Ploughed twice: Sept 12 and Nov 28, 1963. Basal PK compound applied, seed drilled at 20 lb: Apr 14, 1964. Cut twice: July 21 and Sept 4.
Hay. Seeds undersown in barley: May 6, 1963. Basal NPK compound applied: Feb 26, 1964. Cut twice: May 27 and July 23. NK compound applied after first cut.

https://doi.org/10.23637/ERADOC-1-160

2nd year Treatment Crops.

All-grass ley. Basal PK compound applied: Nov 27, 1963. 'Nitro-Chalk' applied: Mar 21, 1964. Cut four times: May 21, June 25, July 22, Oct 20. NK compound applied after first 3 cuts.

Clover-grass ley. Basal PK compound applied: Nov 27, 1963. Cut three times: May 21, June 25, July 24, 1964. Muriate of potash applied after each cut. Topped with mower: Oct 27.

Lucerne. Basal PK compound applied: Nov 27, 1963. Sprayed with paraquat at 2 lb ion in 40 gals: Feb 12, 1964. Cut three times: June 11, July 21, Sept 4.

Sugar beet. Ploughed three times: Aug 20, Oct 12, Nov 28, 1963. Muriate of potash applied: Feb 21, 1964. Basal NPK compound applied: Apr 3. 'Nitro-Chalk' applied: Apr 7. Seed drilled at 5.25 lb: Apr 9. Springtine cultivated up, redrilled at 5.25 lb: May 7. Sprayed with DDT at 0.6 lb in 30 gals: May 27. Singled: June 10. Sprayed twice with menazon (Saphicol at 0.75 pints in 35 gals): July 2 and July 23. Lifted: Nov 9.

3rd year Treatment Crops.

All-grass ley. Basal PK compound applied: Nov 27, 1963. 'Nitro-Chalk' applied: Mar 21, 1964. Crop failed, destroyed with paraquat at 4 lb ion in 40 gals: Apr 10. Rotary cultivated twice: Apr 27 and 28. Seed sown at 38.5 lb: May 6. Sprayed with 2,4-D butoxyethylester at 0.44 lb a.e. in 40 gals: June 10. Cut four times: July 13, Aug 4, Sept 7, Oct 20. NK compound applied after first 2 cuts, (it was intended to plough after the 3rd cut but the land was too hard and by the time ploughing was possible there was enough growth to make a 4th cut).

Clover-grass ley. Basal PK compound applied: Nov 27, 1963. Cut four times: May 21, June 25, July 24, Sept 7, 1964. Muriate of potash applied after first 3 cuts.

Lucerne. Basal PK compound applied: Nov 27, 1963. Sprayed with paraquat at 2 lb ion in 40 gals: Feb 12, 1964. Cut three times: June 11, July 21, Sept 4.

Oats. Ploughed: Nov 26, 1963. Seed combine drilled at 4 bushels: Mar 6, 1964. 'Nitro-Chalk' applied: Mar 9. Sprayed with dicamba/MCPA (Banlene at 4 pints in 40 gals): May 28. Combine harvested: Aug 22.

1st Test Crop, Wheat.

Ploughed: Sept 20, 1963. Seed combine drilled at 2.75 bushels: Oct 15. 'Nitro-Chalk' applied: Apr 14, 1964. Combine harvested: Aug 25.

https://doi.org/10.23637/ERADOC-1-160

2nd Test Crop, Potatoes.

Dung applied, plots ploughed: Sept 26, 1963. Ploughed second time: Nov 28. Fertilisers applied: May 5, 1964. Potatoes machine planted: May 6. Earthed up: June 23. Sprayed twice with mancozeb at 1.2 lb in 35 gals: July 1 and Aug 6. Sprayed with diquat (Reglone at 4 pints in 40 gals): Sept 8. Lifted: Sept 16.

3rd Test Crop, Barley.

Additional P and K applied: Nov 9, 1963. Ploughed: Nov 26. Seed combine drilled at 2.5 bushels: Feb 15, 1964. 'Nitro-Chalk' applied: Feb 20. Combine harvested: Aug 11.

Permanent grasses.

14th, 15th and 16th years reseeded grass, blocks 1, 3, 6, 8, 9 and 11. Basal PK compound applied: Nov 27, 1963. 'Nitro-Chalk' applied to 'all-grass' half plots: Mar 21, 1964. Cut three times: May 21, June 25 and July 23 ('all-grass'), Aug 4 ('clover-grass'). Muriate of potash and NK compound applied to appropriate half plots after each cut. Topped with mower: Oct 27.

15th year reseeded grass, blocks 5 and 7. Basal PK compound applied: Nov 27, 1963.

Block 5. 'Nitro-Chalk' applied twice: Mar 21 and July 15, 1964. Grazed 7 circuits: May 5 - Aug 20.

Block 7. 'Nitro-Chalk' applied: Mar 21, 1964. Cut for silage: May 27. 2nd dressing of 'Nitro-Chalk' applied: May 28. Grazed 4 circuits: June 22 - Aug 26.

Standard errors per sub-plot. Test crops.

Wheat, grain	Highfield:	4.78 or 9.4% (55 d.f.)
	Fosters:	3.68 or 6.8% (55 d.f.)
Barley, grain	Highfield:	3.54 or 6.4% (23 d.f.)
	Fosters:	2.55 or 4.6% (23 d.f.)

NOTE: For explanation of treatment symbols see page 64/B/1.23.

https://doi.org/10.23637/ERADOC-1-160

64/B/1.6

SUMMARY OF RESULTS

WHEAT 1ST TEST CROP

Treatment crops 1961 - 1963

	Lu	Ley	CG	R	AH
GRAIN					
HIGHFIELD					
			(±2.39)*		
To test crop					
N0	46.3	51.6	38.3	48.1	31.4
N1	61.2	51.3	48.1	49.4	46.6
N2	54.2	53.1	54.0	50.4	54.4
N3	61.7	51.1	55.7	46.9	61.4
Mean	55.8	51.8	49.0	48.7	48.4
FOSTERS					
			(±1.84)*		
To test crop					
N0	47.3	56.1	44.4	54.5	26.7
N1	55.6	57.0	56.5	57.7	45.0
N2	59.6	56.4	58.2	57.1	56.6
N3	58.0	54.0	56.6	55.5	62.8
Mean	55.2	55.9	53.9	56.2	47.8

* For use only in vertical and interaction comparisons

NOTE: N levels are different on AH from remainder. See 64/B/1.2

https://doi.org/10.23637/ERADOC-1-160

64/B/1.7

WHEAT 1ST TEST CROP

Treatment crops 1961 - 1963

	Lu	Ley	CG	R	AH
STRAW					
HIGHFIELD					
To test crop					
N0	42.9	49.7	32.9	53.6	22.5
N1	50.7	52.2	39.9	52.8	35.9
N2	50.6	50.2	43.6	52.7	42.5
N3	55.9	51.8	45.3	53.7	45.4
Mean	50.0	51.0	40.4	53.2	36.6
FOSTERS					
To test crop					
N0	39.0	49.9	33.5	48.8	21.1
N1	50.0	53.0	47.1	55.6	38.2
N2	54.3	55.1	49.5	54.4	47.8
N3	59.4	51.3	54.3	56.8	52.7
Mean	50.7	52.3	46.1	53.9	39.9

NOTE: N levels are different on AH from remainder. See 64/B/1.2

https://doi.org/10.23637/ERADOC-1-160

64/B/1.8

POTATOES 2ND TEST CROP. TOTAL TUBERS

Treatment crops 1960 - 1962

	Lu	Ley	CG	AH	RG	Mean
			HIGHFIELD			
Mean	14.29	16.10	14.99	14.19	16.62	15.24
N: wheat 1963						
N0	14.54	15.47	15.44	14.62	16.00	15.21
N1	14.81	16.43	14.32	12.96	17.02	15.11
N2	13.77	16.08	14.98	14.90	16.31	15.21
N3	14.05	16.43	15.23	14.30	17.13	15.43
N: 1964						
N1	13.39	16.07	14.70	13.86	16.75	14.95
N2	15.20	16.13	15.28	14.53	16.49	15.53
F	14.71	15.77	14.94	14.03	16.43	15.18
D	13.88	16.43	15.04	14.35	16.81	15.30
P1	14.56	16.27	14.78	13.67	16.51	15.16
P2	14.02	15.93	15.20	14.72	16.72	15.32
K1	14.41	15.70	15.04	14.21	16.27	15.13
K2	14.18	16.50	14.94	14.18	16.96	15.35

64/B/1.9

POTATOES 2ND TEST CROP. TOTAL TUBERS

N: 1963

HIGHFIELD

N: 1964	NO	N1	N2	N3
N1	14.97	14.49	15.22	15.13
N2	15.46	15.73	15.20	15.71
F	15.09	15.04	15.04	15.53
D	15.33	15.19	15.37	15.33
P1	15.00	15.09	15.33	15.21
P2	15.43	15.12	15.08	15.64
K1	15.01	15.06	15.40	15.04
K2	15.42	15.17	15.02	15.81

N: 1964	O	M	P1	P2	K1	K2
N1	14.86	15.04	14.87	15.04	14.81	15.09
N2	15.49	15.56	15.45	15.60	15.44	15.61
F			15.18	15.18	14.97	15.38
D			15.15	15.46	15.28	15.33
P1					15.09	15.23
P2					15.17	15.47

https://doi.org/10.23637/ERADOC-1-160

64/B/1.10

POTATOES 2ND TEST CROP. TOTAL TUBERS

Treatment crops 1960 - 1962

	Lu	Ley	CG	AH	RG	Mean
			FOSTERS			
Mean	12.75	12.48	13.25	12.64	14.96	13.22
N: wheat 1963						
N0	12.57	12.24	12.88	13.30	14.61	13.12
N1	12.90	12.55	13.34	12.99	15.31	13.42
N2	13.07	12.68	13.25	12.08	14.88	13.19
N3	12.46	12.42	13.51	12.19	15.03	13.12
N: 1964						
N1	12.65	12.41	13.47	12.56	14.81	13.18
N2	12.84	12.54	13.02	12.72	15.11	13.25
F	12.70	12.59	13.44	12.19	14.88	13.16
D	12.80	12.36	13.05	13.09	15.04	13.27
P1	12.84	12.29	12.95	12.33	14.89	13.06
P2	12.66	12.66	13.54	12.95	15.02	13.37
K1	12.66	12.30	13.22	12.51	14.89	13.12
K2	12.84	12.65	13.27	12.77	15.02	13.31

https://doi.org/10.23637/ERADOC-1-160

64/B/1.11

POTATOES 2ND TEST CROP. TOTAL TUBERS

N: 1963

	NO	N1	N2	N3
	FOSTERS			
N: 1964				
N1	12.76	13.51	13.00	13.45
N2	13.48	13.32	13.39	12.79
F	12.87	13.21	13.25	13.32
D	13.38	13.64	13.14	12.92
P1	13.05	13.19	13.26	12.75
P2	13.19	13.65	13.12	13.49
K1	12.91	13.27	13.12	13.15
K2	13.32	13.56	13.26	13.09

	O	M	P1	P2	K1	K2
N: 1964						
N1	13.11	13.25	13.01	13.36	13.26	13.10
N2	13.21	13.28	13.11	13.38	12.97	13.53
F			12.96	13.37	13.17	13.15
D			13.17	13.37	13.06	13.47
P1					13.03	13.09
P2					13.20	13.53

https://doi.org/10.23637/ERADOC-1-160

64/B/1.12

POTATOES 2ND TEST CROP. % WARE

Treatment crops 1961 - 1963

	Lu	Ley	CG	AH	RG	Mean
			HIGHFIELD			
Mean	94.7	95.4	95.3	94.6	95.9	95.2
N: wheat 1963						
N0	94.9	95.2	95.3	94.0	95.6	95.0
N1	95.2	95.2	95.1	94.6	95.8	95.2
N2	94.5	95.0	95.6	94.8	96.2	95.2
N3	94.2	96.0	95.1	95.2	95.9	95.3
N: 1964						
N1	94.6	95.0	94.7	94.0	95.8	94.8
N2	94.8	95.7	95.9	95.3	95.9	95.5
F	95.3	95.6	95.6	94.5	96.1	95.4
D	94.1	95.1	94.9	94.7	95.7	94.9
P1	94.8	95.6	95.0	94.7	95.9	95.2
P2	94.6	95.1	95.6	94.6	95.8	95.1
K1	94.8	95.4	94.9	94.4	95.6	95.0
K2	94.6	95.3	95.7	94.9	96.2	95.3

https://doi.org/10.23637/ERADOC-1-160

64/B/1.13

POTATOES 2ND TEST CROP. % WARE

N: 1963

HIGHFIELD

N: 1964	N0	N1	N2	N3
N1	94.7	94.6	95.1	94.8
N2	95.3	95.7	95.4	95.7
F	95.3	95.4	95.5	95.5
D	94.7	95.0	94.9	95.1
P1	94.9	95.4	95.2	95.2
P2	95.2	94.9	95.3	95.4
K1	94.9	95.1	95.0	95.0
K2	95.0	95.2	95.5	95.6

N: 1964	0	M	P1	P2	K1	K2
N1	95.0	94.6	94.8	94.8	94.7	95.0
N2	95.8	95.2	95.6	95.4	95.4	95.7
F			95.5	95.4	95.2	95.6
D			94.9	94.9	94.8	95.0
P1					95.0	95.4
P2					95.0	95.3

https://doi.org/10.23637/ERADOC-1-160

64/B/1.14

POTATOES 2ND TEST CROP. % WARE

Treatment crops 1961 - 1963

	Lu	Ley	CG	AH	RG	Mean
			FOSTERS			
Mean	93.3	93.4	93.7	93.0	94.3	93.5
N: wheat 1963						
N0	92.7	93.2	93.5	93.9	94.5	93.6
N1	92.9	93.2	93.4	93.1	94.3	93.4
N2	93.7	93.2	93.6	93.2	93.9	93.5
N3	93.9	93.8	94.4	92.0	94.4	93.7
N: 1964						
N1	93.3	93.1	93.7	92.7	93.9	93.3
N2	93.3	93.6	93.8	93.4	94.7	93.8
F	93.2	93.3	93.9	92.9	94.0	93.5
D	93.4	93.4	93.6	93.2	94.5	93.6
P1	93.4	93.5	93.9	93.5	94.6	93.8
P2	93.2	93.2	93.6	92.6	94.0	93.3
K1	92.9	92.9	93.2	93.2	93.9	93.2
K2	93.7	93.8	94.3	92.9	94.6	93.9

https://doi.org/10.23637/ERADOC-1-160

64/B/1.15

POTATOES 2ND TEST CROP. % WARE

N: 1963

	NO	N1	N2	N3
	FOSTERS			
N: 1964				
N1	92.9	93.5	93.5	93.4
N2	94.2	93.3	93.5	94.0
F	93.2	93.1	93.5	94.1
D	93.9	93.6	93.6	93.3
P1	93.7	93.7	93.8	93.9
P2	93.4	93.0	93.3	93.5
K1	93.2	93.3	93.0	93.4
K2	93.9	93.4	94.1	94.0

	O	M	P1	P2	K1	K2
N: 1964						
N1	93.3	93.4	93.5	93.1	93.0	93.5
N2	93.6	93.8	94.0	93.5	93.4	94.1
F			93.8	93.1	93.0	93.9
D			93.7	93.5	93.5	93.8
P1					93.4	94.1
P2					93.0	93.6

https://doi.org/10.23637/ERADOC-1-160

64/B/1.16

BARLEY 3RD TEST CROP

GRAIN

Treatment crops 1959 - 1961

	Lu	Ley	CG	AH	Mean
		HIGHFIELD			
Mean	56.6	57.9	52.9	53.9	55.3
		(±1.77)*			(±0.89)
N0	56.7	57.0	48.8	50.7	53.3
N1	56.6	57.9	50.8	54.6	55.0
N2	56.2	59.6	55.7	56.2	56.9
N3	57.0	57.2	56.4	54.0	56.2
Dung 1963					
0	57.8	56.6	50.7	51.8	54.2
D	55.4	59.2	55.2	56.0	56.5

Excluding AH

Dung 1963	N0	N1	N2	N3	Mean
		(±1.25)			
0	50.9	54.1	56.3	55.7	55.0
D	55.7	55.9	57.6	56.6	56.6

* For use in vertical and interaction comparisons

Mean D.M. %: 80.0

64/B/1.17

BARLEY 3RD TEST CROP

GRAIN

Treatment crops 1959 - 1961

	Lu	Ley	CG	AH	Mean
		FOSTERS			
Mean	58.0	55.7	53.9	54.7	55.5
		(±1.27)*			(±0.74)
N0	56.0	54.0	50.0	46.2	53.3
N1	58.8	55.8	54.3	-	-
N2	58.9	55.5	55.8	56.2	56.7
N3	58.3	57.3	55.3	56.9	57.0
N4	-	-	-	59.3	-
Dung 1963					
O	58.7	54.8	52.6	53.8	55.0
D	57.2	56.6	55.1	55.6	56.1

Dung 1963	N0	N1	N2	N3	Mean
		Excluding AH			
		(±1.04)			(±0.52)
O	51.4	56.3	56.5	57.3	55.4
D	55.3	56.3	56.9	56.6	56.3
Mean (±0.74)	53.4	56.3	56.7	57.0	55.8

* For use in vertical and interaction comparisons

Mean D.M. %: 82.2

64/B/1.18

TREATMENT CROPS ARABLE AND HAY ROTATION

HAY: DRY MATTER

N: 1963

Dung 1962	N0	N1	N2	N3	Mean
		HIGHFIELD			
0	104.2	95.1	108.0	93.9	100.3
D	108.6	104.5	100.4	93.4	101.7
Mean	106.4	99.8	104.2	93.6	101.0
		FOSTERS			
0	94.6	92.2	95.6	96.6	94.7
D	93.9	90.4	87.2	86.1	89.4
Mean	94.2	91.3	91.4	91.3	92.1

https://doi.org/10.23637/ERADOC-1-160

64/B/1.19

TREATMENT CROPS ARABLE AND HAY ROTATION

HIGHFIELD			FOSTERS		
N1	N2	Mean	N1	N2	Mean
		SUGAR BEET			
		ROOTS			
14.81	15.69	15.25	12.37	12.91	12.64
		SUGAR %			
20.3	20.0	20.1	20.2	19.6	19.9
		TOTAL SUGAR			
60.0	62.8	61.4	50.1	50.8	50.4
		TOPS			
6.17	6.48	6.32	5.02	5.59	5.30
		OATS			
		GRAIN			
		22.9			48.4

Oats, grain, mean D.M. %: Highfield 85.9
Fosters 88.6

https://doi.org/10.23637/ERADOC-1-160

64/B/1.20

LUCERNE: DRY MATTER

	HIGHFIELD Dung 1962			FOSTERS Dung 1962		
	O	D	Mean	O	D	Mean
1st year (2 cuts)	40.9	41.5	41.2	30.8	35.6	33.2
2nd year (3 cuts)			67.6			79.1
3rd year (3 cuts)			48.6			62.5

ALL-GRASS LEY: DRY MATTER

	HIGHFIELD Dung 1962			FOSTERS Dung 1962		
	O	D	Mean	O	D	Mean
1st year (2 cuts)	22.6	27.0	24.8	8.4	10.0	9.2
2nd year (4 cuts)			63.8			59.3
3rd year (4 cuts)			66.4			36.8

https://doi.org/10.23637/ERADOC-1-160

64/B/1.21

CLOVER-GRASS LEY: DRY MATTER

	HIGHFIELD Dung 1962			FOSTERS Dung 1962		
	O	D	Mean	O	D	Mean
1st year (1 cut Fosters) (2 cuts Highfield)	17.9	20.4	19.1	3.4	5.8	4.6
2nd year (3 cuts)			48.8			55.4
3rd year (4 cuts)			41.8			48.8

PERMANENT GRASS, CUT FOR SILAGE

DRY MATTER

	N0	N1	Mean
HIGHFIELD			
14th exptl year			
Blocks 9 and 12	34.8	65.2	50.0
Blocks 10 and 11	36.2	65.0	50.6
15th exptl year			
Blocks 5 and 8	34.4	64.0	49.2
Blocks 6 and 7	36.3	66.8	51.5
16th exptl year			
Blocks 1 and 4	39.2	62.5	50.8
Block 2	37.2	61.8	49.5

(N0) Clover-grass management
(N1) All-grass management

https://doi.org/10.23637/ERADOC-1-160

64/B/1.22

RESEEDED GRASS: DRY MATTER

	Highfield			Fosters		
	N: (per cut) N0	N1	Mean	N: (per cut) N0	N1	Mean
14th exptl year	32.2	67.8	50.0	38.2	62.8	50.5
15th exptl year	39.8	68.0	53.9	50.2	68.2	59.2
16th exptl year	39.2	63.1	51.2	49.7	69.8	59.8

(N0) Clover-grass management
(N1) All-grass management

	Cut for silage Mean	Grazed estimated from sampling cuts Mean
	HIGHFIELD	
15th exptl year		
Block 5	41.1	20.6*
Block 8		40.2
	FOSTERS	
15th exptl year		
Block 7	43.3	23.6*
Block 5		28.9

* Aftermath grazing

https://doi.org/10.23637/ERADOC-1-160

Treatment symbols used in this and future reports

TREATMENT CROPS

Lu = Lucerne
Ley = Grazed ley
CG = Cut grass
AH = Arable with hay
R = Reseeded grass

WHEAT, 1ST TEST CROP

N cwt per acre

	Highfield		Fosters	
	All except AH	AH	All except AH	AH
N0	0.0	0.0	0.0	0.00
N1	0.3	0.4	0.4	0.53
N2	0.6	0.8	0.8	1.07
N3	0.9	1.2	1.2	1.60

POTATOES, 2ND TEST CROP

N cwt per acre (including basal)

	Highfield	Fosters
N1	0.75	1.00
N2	1.25	1.50

P205 cwt per acre		K20 cwt per acre	
P1	0.9	K1	0.9
P2	1.8	K2	1.8

F = Pk to sub plots without dung
D = Dung 12 tons per acre

BARLEY, 3RD TEST CROP

N cwt per acre

	Highfield	Fosters
N0	0.0	0.0
N1	0.1	0.2
N2	0.2	0.4
N3	0.3	0.6
N4		0.8

https://doi.org/10.23637/ERADOC-1-160

64/B/1.24

SUGAR BEET, TREATMENT CROP

N cwt per acre (including basal)

N1	1.0
N2	1.5

ERRATUM to 'Results' 1963 pages 63/B/1.10, 1.11, 1.14 and 1.15.
Potatoes 2nd test crop Fosters. Levels of N cwt per acre 1963 should read:

1.00 not 0.75
1.50 not 1.25

https://doi.org/10.23637/ERADOC-1-160

REFERENCE PLOTS

ROTHAMSTED (R) GREAT FIELD IV

and

WOBURN (W) STACKYARD SERIES C, 1964

(RA and WRA)

For details of previous years' results, and for rates of fertilisers, etc., see 'Results' 58/Bc/1, 59/Bc/1, 60/B/3, 61/B/2, 62/B/2, 63/B/2. For sitka spruce see 63/B/2.

Cultivations, etc.:

Great Field IV (R):-

Winter wheat: Dug by hand: Sept 16, 1963. P,K,Mg,Ca and S applied and seed drilled: Oct 4. First N dressings applied: Mar 10, 1964. Second N dressings applied: Apr 15. Trace element spray applied: Apr 29. Harvested: Aug 14.

Kale: Dung applied: Nov 4, 1963. Dug by hand: Nov 9. P,K,Mg,Ca and S and first N dressings applied: Mar 10, 1964. Rotary cultivated, seed drilled: Apr 8. Second N dressings applied: May 27. Trace element spray applied: June 11. Harvested: Nov 3.

Barley: Dug by hand: Nov 28, 1963. N,P,K,Mg,Ca and S applied, rotary cultivated, seed drilled: Mar 10, 1964. Trace element spray applied: May 23. Harvested: Aug 13.

Grass-clover ley: Undersown in barley: Apr 20, 1963. N,P,K,Mg,Ca and S applied: Mar 10, 1964. Trace element spray applied: Apr 29. Cut four times: Oct 30, 1963, May 20, 1964, July 7 and Sept 7.

Potatoes: Dung applied: Nov 4, 1963. Dug by hand: Nov 8. Mg applied: Mar 10, 1964. First N dressing, P,K,Ca and S applied: Apr 15, 1964. All plots rotary cultivated, setts planted: Apr 29. Second N dressing applied: May 27. Trace element spray applied: June 11. Harvested: Plots receiving no K (where haulm died early) - Aug 8, remainder - Sept 4.

Permanent grass: Dung applied: Jan 24, 1964. P,K and first N dressing applied: Mar 10. Second N dressing applied: May 22. Third N dressing applied: July 16. Cut three times: May 20, July 16, Oct 29.

https://doi.org/10.23637/ERADOC-1-160

Stackyard Series C (W):-

Oats: P, K and first N dressing applied, rotary cultivated, seed drilled: Mar 9, 1964. Second N dressing applied: May 5. Sprayed with mecoprop at 2.4 lb in 50 gals: May 14. Harvested: Aug 10.

Sugar beet: Dung applied, plots dug by hand: Dec 5, 1963. P,K and first N dressing applied, all plots rotary cultivated, seed drilled: Apr 10, 1964. Second N dressing applied: May 29. Singled: May 26. Sprayed four times with dimethoate at 3 fluid oz in 40 gals: June 8, June 25, Aug 6, Aug 21. Harvested: Oct 13.

Barley: P,K and first N dressing applied, all plots rotary cultivated, seed drilled: Mar 9, 1964. Second N dressing applied: May 29. Crop eaten by rooks: July 8.

Grass-clover ley: Undersown in barley: Apr 22, 1963. N,P and K applied: Mar 9, 1964. Cut four times: Oct 22, 1963, May 22, 1964, July 21, Sept 11.

Potatoes: Dung applied, plots dug by hand: Dec 6, 1963. P,K and first N dressing applied, all plots rotary cultivated, setts planted: Apr 10, 1964. Second N dressing applied: May 29. Sprayed with dimethoate at 3 fluid oz in 40 gals: June 8. Sprayed with copper oxychloride fungicide at 2.3 lb Cu in 40 gals: July 3. Sprayed with dimethoate at 3 fluid oz in 40 gals: July 6. Harvested: Sept 3.

Permanent grass: Dung applied: Jan 26, 1964. P,K and first N dressing applied: Feb 20. Second N dressing applied: May 29. Third N dressing applied: July 23. Cut three times: May 25, July 21 and Oct 30.

Soft fruit: Dung applied: Dec 6, 1963. NPK applied: Feb 20, 1964. Forked over frequently to remove weeds.

Sitka spruce: No spruce litter was applied in 1964. Formalin applied: Dec 17, 1963. All manures (other than N) dug in: Mar 23, 1964. Seed sown: Apr 7. N top-dressed: July 1, 27 and Aug 28.

NOTE. Samples were taken for determination of dry matter of tops and roots separately, and for N, P, K, Ca, Mg in total crop.

Erratum to 'Results' 63/B/2.6: Under Treatments - the spruce litter was applied in 1961, 1962 and 1963.

Standard errors per plot. Sitka spruce:
Mean height: 0.216 inches or 16.7% (13 d.f.)
Plant number: 164.8 per sq yard or 14.7% (13 d.f.)

https://doi.org/10.23637/ERADOC-1-160

SUMMARY OF RESULTS

GREAT FIELD IV (R): ORIGINAL PLOTS

Treatment	Winter wheat GRAIN	Winter wheat STRAW	Kale: TOTAL WEIGHT	Barley GRAIN	Barley STRAW	Ley: DRY MATTER 1st cut	Ley: DRY MATTER 2nd cut	Ley: DRY MATTER 3rd cut	Ley: DRY MATTER 4th cut	Total of 4 cuts	Potatoes: TOTAL TUBERS	Permanent grass: DRY MATTER 1st cut	Permanent grass: DRY MATTER 2nd cut	Permanent grass: DRY MATTER 3rd cut	Total of 3 cuts
None	38.8	47.4	9.46	22.5	18.9	2.7	24.2	24.4	24.4	75.7	4.25	7.4	16.9	3.8	28.1
N1	44.4	56.9	9.90	22.7	19.6	2.2	24.1	19.0	23.1	68.4	5.55	17.7	17.0	5.2	39.9
P	40.5	51.4	15.54	24.7	20.9	4.1	25.4	20.7	15.5	65.7	7.29	9.6	12.3	2.4	24.3
N1P	35.5	50.8	13.54	33.3	27.1	1.1	22.5	13.2	10.1	46.9	5.17	23.3	18.7	5.1	47.1
K	37.3	54.5	7.38	21.8	17.8	4.4	20.2	21.8	15.6	62.0	7.64	8.4	11.7	4.0	24.1
N1K	38.8	52.5	13.98	27.5	22.8	3.4	22.8	25.8	24.4	76.4	8.77	23.9	22.3	9.0	55.2
PK	42.4	62.9	14.24	26.9	24.2	8.5	33.4	36.5	28.9	107.3	10.07	11.9	16.3	3.9	32.1
N1PK	56.1	81.6	13.46	28.1	23.3	5.0	44.2	33.5	31.5	114.2	11.80	26.2	20.7	5.3	52.2
N2PK	48.4	86.6	20.66	36.9	33.9	3.5	42.4	32.1	29.8	107.8	13.11	34.9	24.1	10.7	69.7
D	50.1	71.6	15.62	27.6	23.2	7.9	36.2	32.6	26.6	103.3	11.98	38.7	16.7	4.3	59.7
N1PKD	46.8	89.3	17.10	33.2	33.3	5.2	41.7	33.2	30.5	110.6	15.46	40.0	22.5	6.4	68.9
N2PKD	45.6	86.4	25.70	39.1	38.0	3.8	54.3	30.5	30.5	119.1	16.76	38.9	19.3	7.5	65.7
Mean D.M.%:	81.8	71.6		82.6	66.9	18.1	20.6	20.1	32.2	22.8		21.1	24.2	27.5	24.3

64/B/2.3

64/B/2.4

GREAT FIELD IV (R): ADDITIONAL PLOTS

Treatment	Winter wheat GRAIN	Winter wheat STRAW	Kale: TOTAL WEIGHT	Barley GRAIN	Barley STRAW	Ley: DRY MATTER 1st cut	Ley: DRY MATTER 2nd cut	Ley: DRY MATTER 3rd cut	Ley: DRY MATTER 4th cut	Total of 4 cuts	Potatoes: TOTAL TUBERS
None	46.0	54.8	14.84	21.6	19.6	4.2	25.4	24.4	24.2	78.2	5.36
N2PK	40.6	85.1	28.82	47.4	44.1	2.8	36.4	21.8	21.6	82.6	15.19
N2PK Mg Ca	38.7	85.3	22.57	47.5	47.8	2.9	38.9	27.2	21.8	90.8	15.28
N2PK Mg S	41.6	80.4	25.09	45.2	41.6	2.4	39.5	24.1	25.2	91.2	15.02
N2PK Ca S	43.3	91.6	25.87	31.5	28.8	2.8	41.5	29.0	26.7	100.0	14.93
N2PK Mg Ca S	41.2	80.2	27.08	41.5	43.4	4.2	44.6	30.7	30.2	109.7	15.28
N2PK Mg Ca S TE	44.2	84.2	23.88	44.8	45.6	2.6	38.5	32.5	32.5	106.1	14.41
Mean D.M. %:	79.7	70.4		85.3	69.6	18.2	21.7	19.5	31.6	22.8	

64/B/2.5

STACKYARD SERIES C (W)

Treatment	Oats GRAIN	Oats STRAW	Sugar beet ROOTS	Barley GRAIN	Barley STRAW	Ley: DRY MATTER 1st cut	Ley: DRY MATTER 2nd cut	Ley: DRY MATTER 3rd cut	Ley: DRY MATTER 4th cut	Ley: Total of 4 cuts	Potatoes: TOTAL TUBERS	Permanent grass: DRY MATTER 1st cut	Permanent grass: DRY MATTER 2nd cut	Permanent grass: DRY MATTER 3rd cut	Permanent grass: Total of 3 cuts
None	15.3	15.8	11.02			7.3	22.8	22.0	6.4	58.5	3.47	24.8	11.6	2.1	38.5
N1	35.4	29.8	12.47			4.0	28.1	15.9	6.0	54.0	4.40	26.8	14.4	6.5	47.7
P	14.2	15.2	9.90			6.7	23.4	21.8	8.6	60.5	3.55	21.4	10.1	1.5	33.0
N1P	37.9	35.2	10.48			3.8	28.0	13.1	4.8	49.7	4.24	28.8	15.7	5.5	50.0
K	14.9	17.2	11.18			11.4	21.0	26.0	8.4	66.8	5.64	31.7	18.5	2.1	52.3
N1K	35.8	38.4	14.66	EATEN		6.9	27.3	21.5	8.5	64.2	7.56	38.4	20.6	7.9	66.9
PK	16.1	18.0	11.74	BY		10.9	22.9	29.1	9.0	71.9	6.32	30.2	18.4	2.1	50.7
N1PK	33.8	35.3	17.55	BIRDS		10.3	31.1	18.8	8.2	68.4	9.03	35.7	19.6	7.1	62.4
N2PK	44.1	43.8	18.46			4.4	38.0	17.6	3.9	63.9	10.26	33.5	26.2	10.2	69.9
D	17.2	18.6	15.06			10.4	24.2	28.3	7.5	70.4	10.57	33.9	14.8	2.1	50.8
N1PKD	36.9	37.2	17.82			10.7	36.8	23.0	6.6	77.1	13.12	35.5	22.7	9.3	67.5
N2PKD	42.1	46.1	20.54			7.0	42.4	22.8	6.1	78.3	15.82	32.0	22.9	11.5	66.4
Mean D.M.%:	80.1	58.6				15.8	25.1	26.8	32.6	25.1		25.5	26.3	21.8	24.5

https://doi.org/10.23637/ERADOC-1-160

64/B/2.6

SITKA SPRUCE

Treatment	MEAN HEIGHT: INCHES	PLANT NUMBER: PER SQ YARD
	(±0.153)	(±116.5)
None	1.18 (1)	1114 (2)
PK Mg	1.19	1248
NK Mg	1.33	1263
NP Mg	1.10	1083
NPK	1.36	1068
NPK Mg	1.16 (1)	1004 (2)
NPK Mg F	1.18	1317
C	1.27	1068
C NPK Mg	1.78	1233
L NPK Mg	1.61	972
Mean	1.29	1124

(1) (±0.108) (2) (±82.4)

NOTE: In September many seedlings showed characteristic needle damage caused by 'smog'.

https://doi.org/10.23637/ERADOC-1-160

64/B/3.1

GREEN MANURING EXPERIMENT

(WGM)

Woburn Stackyard - revised 1964.

For history, treatments, etc., see 'Details' 1962.

Area of each sub-plot: 0.0195. Area harvested: 0.0146.

Barley will be grown on all plots from 1964 onwards.

Treatments. 1964:
Old fallow plots. N1 N2 N3 N4.
Remainder. All combinations of:-
1. Green manures: none (duplicate plots), trefoil, ryegrass undersown annually (whole plots).
2. N0 N1 N2 N3.

Levels: N0 - none
N1 - 0.3 (cwt N as 'Nitro-Chalk')
N2 - 0.6
N3 - 0.9
N4 - 1.2

Each plot is split into 2, the N levels being paired as follows:-
(N0, N2) (N1, N3) (N2, N4).
All treatments are cumulative. Residual effects of certain past treatments are ascertainable.

Basal dressing: 3 cwt 0:20:20 combine drilled.

Cultivations, etc.:-
Barley after barley (Upper Half): 'Fallow' plots ploughed: Nov 25, 1963. Green manure plots ploughed: Feb 3, 1964.
Barley after sugar beet (Lower Half): Ground chalk applied at 22 cwt: Dec 10, 1963. Ploughed: Jan 3, 1964.
All plots: Seed drilled at 2.75 bushels: Mar 10, 1964. 'Nitro-Chalk' applied: Mar 12. Ryegrass at 40 lb and trefoil at 30 lb undersown: May 6. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals) - except plots undersown with trefoil: May 21. Combine harvested: Aug 22. Varieties: Barley - Maris Badger, trefoil - English, ryegrass - English Leafy Italian.

https://doi.org/10.23637/ERADOC-1-160

64/B/3.2

SUMMARY OF RESULTS

BARLEY AFTER SUGAR BEET

GRAIN

EXCLUDING PLOTS FALLOW UNDER OLD SCHEME

N 1964

	N0	N1	N2	N3	Mean
Mean	11.9	18.5	28.4	33.2	23.0
N 1963*					
N0	14.4	20.9	26.0	32.6	23.5
N1	13.6	15.7	29.2	32.7	22.8
N2	9.7	21.5	31.5	33.0	23.9
N3	9.7	15.9	26.9	34.6	21.8
Undersown 1964					
O	13.0	18.8	29.3	32.4	23.4
T	11.2	16.3	28.6	32.8	22.3
R	10.2	20.0	26.4	35.1	22.9
Green manures 1955 - 63					
T	11.0	17.4	24.7	33.5	21.6
R	11.3	15.3	32.8	26.4	21.4
TU	13.7	22.8	33.7	35.6	26.5
RU	11.5	18.5	22.5	37.4	22.5
Dung last applied 1953					
O	13.0	17.4	28.7	31.4	22.6
D	10.7	19.6	28.1	35.0	23.4

T = Trefoil grown as a green manure after early potatoes
R = Ryegrass grown after early potatoes
TU = as T, but with trefoil undersown in the barley
RU = as R, but with ryegrass undersown in the barley.

*N to sugar beet 1963 at 0, 0.67, 1.33, 2.00 cwt N.

https://doi.org/10.23637/ERADOC-1-160

64/B/3.3

BARLEY AFTER SUGAR BEET

GRAIN

EXCLUDING PLOTS FALLOW UNDER OLD SCHEME

GREEN MANURES 1955 - 63

Dung last applied 1953	T	R	TU	RU
0	20.2	23.0	26.8	20.5
D	23.1	19.9	26.1	24.4

PLOTS FALLOW UNDER OLD SCHEME

N 1964

	N1	N2	N3	N4	Mean
Mean	14.3	24.4	34.3	37.7	27.7
N 1963*					
N0	12.1	20.8	36.2	43.6	28.2
N1	21.2	25.8	35.1	36.4	29.6
N2	10.1	29.1	25.0	35.0	24.8
N3	13.9	22.1	40.8	36.0	28.2
Dung last applied 1953					
0	17.6	25.0	37.9	39.3	29.9
D	11.1	23.9	30.6	36.2	25.5

*N to sugar beet 1963 at 0, 0.67, 1.33, 2.00 cwt N.

https://doi.org/10.23637/ERADOC-1-160

64/B/3.4

BARLEY AFTER BARLEY

GRAIN

EXCLUDING PLOTS FALLOW UNDER OLD SCHEME

N 1964

	N0	N1	N2	N3	Mean
Mean	17.3	26.9	36.2	40.0	30.1
N 1963					
N0	20.2	29.4	33.8	42.1	31.4
N1	17.5	24.6	36.6	41.2	30.0
N2	15.4	28.1	38.2	40.0	30.5
N3	16.0	25.4	36.2	36.8	28.6
Undersown 1964					
O	18.2	28.2	37.9	40.4	31.2
T	14.7	24.6	30.3	39.5	27.3
R	18.1	26.5	38.8	39.9	30.8
Green manures 1955 - 64					
T	13.5	21.6	32.6	37.4	26.3
R	14.6	22.0	34.2	40.5	27.8
TU	26.1	38.9	40.4	41.6	36.7
RU	14.9	25.1	37.7	40.6	29.6
Dung last applied 1952					
O	17.2	26.1	36.5	38.3	29.5
D	17.4	27.6	36.0	41.8	30.7

T = Trefoil grown as a green manure after early potatoes
R = Ryegrass grown after early potatoes
TU = as T, but with trefoil undersown in the barley
RU = as R, but with ryegrass undersown in the barley.

https://doi.org/10.23637/ERADOC-1-160

64/B/3.5

BARLEY AFTER BARLEY

GRAIN

EXCLUDING PLOTS FALLOW UNDER OLD SCHEME

GREEN MANURES 1955 - 63

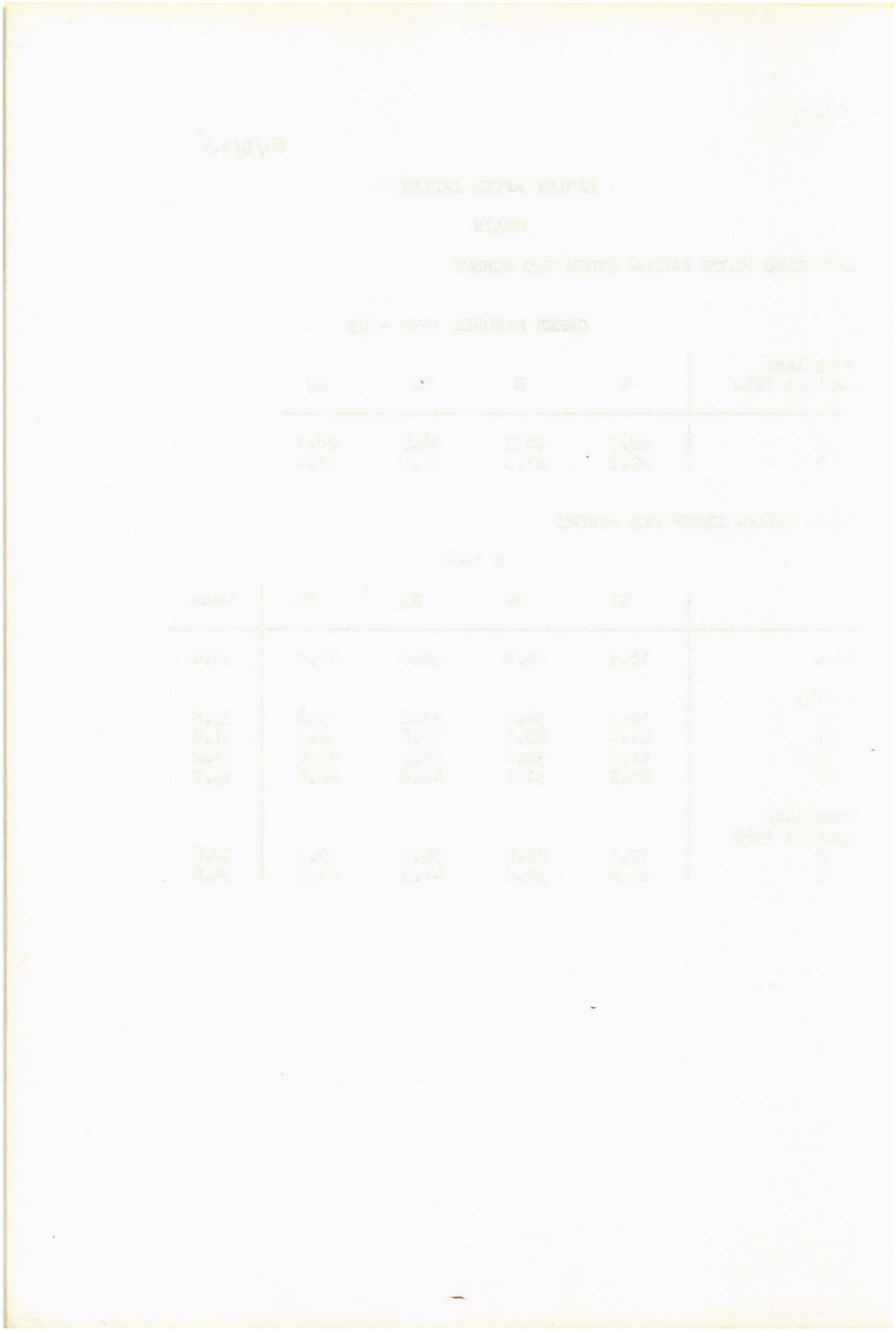
Dung last applied 1952	T	R	TU	RU
0	22.7	28.7	38.5	28.1
D	29.8	27.0	35.0	31.0

PLOTS FALLOW UNDER OLD SCHEME

N 1964

	N1	N2	N3	N4	Mean
Mean	18.9	30.8	38.8	41.7	32.6
N 1963					
N0	12.3	34.0	43.2	44.8	33.6
N1	21.4	28.1	41.8	36.0	31.8
N2	21.8	30.0	29.5	43.6	31.2
N3	20.2	31.1	40.8	42.6	33.7
Dung last applied 1952					
0	17.1	29.6	36.3	39.3	30.6
D	20.8	32.0	41.3	44.2	34.6

https://doi.org/10.23637/ERADOC-1-160



https://doi.org/10.23637/ERADOC-1-160

LEY AND ARABLE ROTATIONS

(WLA)

Woburn Stackyard 1964 - the 27th year.

For history, treatments etc., see 'Details 1962'.

Barley and carrots: The varieties are now respectively Maris Badger and Autumn King.

Lucerne: In view of the failure to control stem eelworm (Ditylenchus dipsaci) this crop is now replaced with common sainfoin (Onobrychus sativa), starting with the first year leys in 1964. Inoculated seed at 56 lb.

Corrective K dressings (in cwt K20):-

Continuous rotations	Fertiliser plots	Dung plots
Rotation		
Arable	3	3
Arable with hay	4	3
Lucerne	3	3
Grazed ley	3	0

Alternating rotations Last 2 rotations in order	Fertiliser plots	Dung plots
Arable with hay/ley	3	3
Ley/Arable with hay	3	2
Arable/Lucerne	3	2
Lucerne/Arable	3	2

Revised NPK dressings (in cwt except where stated)

	Fertilisers and time of application	N	P2O5	K2O
Grazed ley 1st year	'Nitro-Chalk', superphosphate and muriate of potash, all in seedbed	0.4	1.5	1.0
	16:0:16 as 2 equal dressings in early and late summer*.	0.8		0.8
2nd and 3rd year	16:0:16 as 3 equal dressings in spring, early and late summer*	1.2		1.2
Sugar beet Test fertilisers				
Grazed ley and lucerne rotations	'Nitro-Chalk' and muriate of potash in seedbed, superphosphate to plough furrow.	0.35	0	0
		0.7	1.5	0.9
Arable and Arable with ley rotations	As above for grazed ley etc.	0.7	0	0
		1.05	1.5	0.9
Basal fertilisers	As above for test fertilisers	0.7	0.9	0.9

https://doi.org/10.23637/ERADOC-1-160

NOTES: (1) The basal fertilisers include 500 lb $MgSO_4$ $7H_2O$.
(2) In 1964 plots not receiving dung received 3.7 cwt K_2O, the K equivalent of the dung used.

* Any dose may be omitted or reduced in wet seasons at the Farm's discretion.

Cultivations, etc.:
Treatment crops.
Ley 1st year. Ploughed twice: Sept 24, 1963 and Jan 3, 1964. Seedbed fertilisers applied: Apr 1. Seed sown: Apr 8. Sprayed with MCPB at 1.9 lb in 40 gals: May 15. Compound fertiliser applied: July 10 and Aug 27. Grazed 5 circuits: June 14 - Oct 16.
Ley 2nd year. Compound fertiliser applied: Mar 20, June 15 and Aug 28. Grazed 6 circuits: May 2 - Oct 24.
Ley 3rd year. Compound fertiliser applied: Mar 20, June 10 and Aug 27. Grazed 4 circuits: May 10 - Oct 20.
Sainfoin 1st year. Ploughed twice: Sept 24, 1963 and Jan 3, 1964. Fertilisers applied: Apr 1. Seed drilled at 56 lb: Apr 8. Sprayed with MCPB at 1.9 lb in 40 gals: May 27. Cut twice: July 23 and Oct 26.
Lucerne 2nd year. Sprayed with paraquat at 1.6 lb in 40 gals: Feb 10, 1964. Fertilisers applied: Mar 20. Sprayed with diquat (Reglone at 4 pints in 60 gals): June 9. Cut 3 times: June 8, July 23, Sept 3.
Lucerne 3rd year. Sprayed with paraquat at 1.6 lb in 40 gals: Feb 10, 1964. Fertilisers applied: Mar 20. Sprayed with diquat (Reglone at 4 pints in 60 gals): June 9. Cut 3 times: June 8, July 23, Sept 3.
Arable rotations.
Potatoes. Ploughed twice: Sept 24, 1963 and Jan 3, 1964. Fertilisers applied: Apr 23. Potatoes machine planted: Apr 29. Earthed up: June 12. Sprayed with mancozeb at 1.6 lb in 50 gals: June 25 and again at 1.2 lb in 40 gals: July 30. Sprayed with diquat (Reglone at 4 pints in 40 gals)*: Sept 2. Lifted: Sept 9.

* Plots 67 and 68 were not sprayed as the haulm was already dead.

Rye. Ploughed: Oct 8, 1963. Seed combine drilled at 3 bushels with PK compound: Oct 18. 'Nitro-Chalk' applied: Mar 26, 1964. Seeds hay mixture undersown on 4 plots: Apr 8. Combine harvested: Aug 25.

https://doi.org/10.23637/ERADOC-1-160

Seeds hay. Seeds undersown in rye at 30 lb: Apr 19, 1963. 'Nitro-Chalk' and PK compound applied: Mar 20, 1964. Compound fertiliser applied: June 5. Cut twice: June 4 and July 28.

Carrots. Ploughed twice: Oct 3, 1963 and Jan 6, 1964. Fertilisers applied: Apr 30. Seed drilled at 3 lb: May 4. Sprayed with menazon at 0.5 lb in 60 gals: May 27 and again twice at 0.5 lb in 50 gals: June 24 and July 29. Lifted: Sept 24.

Test crops.

Sugar beet. Dung equivalent K and half corrective K applied: Oct 2, 1963. Dung applied, all plots ploughed: Oct 4. Half corrective K, basal superphosphate, muriate of potash and test superphosphate applied: Mar 9, 1964. Basal magnesium sulphate, test 'Nitro-Chalk' and muriate of potash applied: Apr 10. Seed drilled at 5 lb: Apr 14. Sprayed with DDT at 0.68 lb in 40 gals: May 21. Singled: May 27. Sprayed with menazon at 0.25 lb in 50 gals: July 27. Lifted: Oct 26.

Barley. Ground chalk applied at 44 cwt: Dec 23, 1963. Ploughed: Jan 3, 1964. Balancing muriate of potash, basal superphosphate and 'Nitro-Chalk' applied: Feb 21. Seed drilled at 2.75 bushels: Mar 10. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 12. Combine harvested: Aug 20.

NOTES: (3) The 3rd year lucerne was infested with stem eelworm and grew poorly throughout the season. The yields are not included in the summary.

(4) Abbreviations for Rotation:
Ley = Grazed ley Lu = Lucerne AH = Arable with hay
AR = Arable with roots.

Standard errors per plot:

Sugar beet.	Roots	Whole plot:	0.673 or 4.3% (4 d.f.)
		1/2 plot:	1.136 or 7.3% (4 d.f.)
		1/4 plot:	0.747 or 4.8% (24 d.f.)
		1/16 plot:	1.590 or 10.2% (32 d.f.)
	Total sugar	Whole plot:	3.04 or 4.9% (4 d.f.)
		1/2 plot:	5.27 or 8.6% (4 d.f.)
		1/4 plot:	3.18 or 5.2% (24 d.f.)
		1/16 plot:	7.00 or 11.4% (32 d.f.)
	Tops	Whole plot:	0.344 or 3.8% (4 d.f.)
		1/2 plot:	0.376 or 4.2% (4 d.f.)
		1/4 plot:	0.426 or 4.7% (24 d.f.)
		1/16 plot:	0.949 or 10.5% (32 d.f.)
Barley.	Grain	Whole plot:	1.34 or 3.1% (4 d.f.)
		1/2 plot:	1.95 or 4.6% (4 d.f.)

https://doi.org/10.23637/ERADOC-1-160

64/B/4.4

SUMMARY OF RESULTS

TREATMENT CROPS

LEY, SHEEP DAYS OF GRAZING

1st year	2nd year	3rd year
1253	1512	1012

SAINFOIN, DRY MATTER

	1st cut	2nd cut	3rd cut	Total
1st year				
Dung in 1959				
-	22.2	10.4		32.6
D	24.6	8.6		33.2
Difference	+2.4	-1.8		+0.6
Lu	22.2	11.0		33.2
AH	24.8	8.0		32.8
Mean	23.5	9.5		33.0

LUCERNE, DRY MATTER

2nd year				
Dung in 1958				
-	9.2	12.2	8.8	30.2
D	13.0	14.4	11.2	38.6
Difference	+3.8	+2.2	+2.4	+8.4
Lu	9.1	9.7	8.0	26.8
AH	13.2	17.0	12.0	42.2
Mean	11.2	13.4	10.0	34.5

64/B/4.5

LUCERNE, DRY MATTER

	1st cut	2nd cut	3rd cut	Total
3rd year				
Dung in 1960				
-		10.5	6.6	17.1
D		6.9	5.4	12.3
Difference		-3.6	-1.2	-4.8
Lu		5.8	4.0	9.8
AH		11.6	8.0	19.6
Mean		8.7	6.0	14.7

https://doi.org/10.23637/ERADOC-1-160

TREATMENT CROPS

	POTATOES		RYE	
	TOTAL TUBERS:	% WARE	GRAIN:	STRAW
Dung				
-	10.64	94.8	39.7	36.6
D*	11.36	94.0	43.0	39.6
Difference	+0.72	-0.8	+3.3	+3.0
Ley	12.34	94.0	42.2	38.8
Lu	11.87	96.4	40.0	37.4
AH	9.68	92.0	40.9	37.2
AR	10.12	95.3	42.3	38.8
Mean	11.00	94.4	41.4	38.1

HAY

YIELD, DRY MATTER

	1st cut	2nd cut	Total
Dung in 1960			
-	44.6	17.0	61.6
D	46.8	17.7	64.5
Difference	+2.2	+0.7	+2.9
Lu	43.6	15.9	59.5
AH	47.8	18.8	66.6
Mean	45.7	17.4	63.1

* Dung applied: Potatoes for test crop sugar beet in 1962
Rye for test crop sugar beet in 1961

Mean D.M. %: Rye, Grain: 84.7
Straw: 87.3

https://doi.org/10.23637/ERADOC-1-160

64/B/4.7

CARROTS

	Roots	Tops
Dung in 1960		
-	15.59	4.56
D	15.08	4.06
Difference	-0.51	-0.50
Ley	17.74	5.30
AR	12.93	3.33
Mean	15.34	4.31

https://doi.org/10.23637/ERADOC-1-160

64/B/4.8

1ST TEST CROP

SUGAR BEET

ROOTS

Previous rotation

		Ley	Lu	AH	AR	Mean
Mean	(±0.476)	17.47	15.27	13.45	16.39	15.65
-	(±0.741)*	17.79	14.92	13.04	15.92	15.42
D		17.15	15.63	13.86	16.86	15.87
Difference	(±1.136)	-0.64	+0.71	+0.82	+0.94	+0.45
Response to additional N						
			(±0.528)			(±0.264)
-		+0.52	+0.46	+1.11	-1.13	+0.24
D		+0.45	-0.89	+0.84	+0.62	+0.25
Response to additional K20						
			(±0.528)			(±0.264)
-		+0.44	+0.98	-0.23	+0.79	+0.50
D		-0.31	+0.87	+0.60	-1.65	-0.12

* For use in horizontal and diagonal comparisons only

https://doi.org/10.23637/ERADOC-1-160

1ST TEST CROP

SUGAR BEET

SUGAR %

Previous rotation

	Ley	Lu	AH	AR	Mean
Mean	19.6	19.9	19.4	19.5	19.6
-	19.8	20.1	19.6	19.6	19.8
D	19.4	19.8	19.3	19.4	19.5
Difference	-0.4	-0.3	-0.3	-0.2	-0.3
Response to additional N					
-	-0.4	0.0	-0.5	-0.6	-0.3
D	-0.5	-0.4	-0.5	-0.6	-0.5
Response to additional K20					
-	+0.1	0.0	-0.1	0.0	-0.1
D	-0.4	+0.2	+0.4	+0.4	+0.1

1ST TEST CROP

SUGAR BEET

TOTAL SUGAR

Previous rotation

		Ley	Lu	AH	AR	Mean
Mean	(±2.15)	68.5	60.9	52.2	63.9	61.4
-	(±3.40)*	70.4	60.0	51.0	62.5	61.0
D		66.6	61.8	53.4	65.4	61.8
Difference	(±5.27)	-3.8	+1.8	+2.4	+2.9	+0.8
Response to additional N						
			(±2.25)			(±1.13)
-		+0.6	+1.8	+3.3	-6.6	-0.2
D		0.0	-4.8	+1.6	+0.4	-0.6
Response to additional K20						
			(±2.25)			(±1.13)
-		+2.1	+4.0	-1.0	+2.8	+1.9
D		-2.3	+4.1	+3.6	-5.2	0.0

* For use in horizontal and diagonal comparisons only

64/B/4.11

1ST TEST CROP

SUGAR BEET

TOPS

Previous rotation

		Ley	Lu	AH	AR	Mean
Mean	(±0.243)	10.49	8.07	8.37	9.18	9.03
-	(±0.308)*	11.27	7.72	8.10	9.54	9.16
D		9.72	8.42	8.63	8.82	8.90
Difference	(±0.376)	-1.55	+0.70	+0.53	-0.72	-0.26
Response to additional N						
			(±0.301)			(±0.151)
-		+0.66	+0.91	+0.82	-0.40	+0.50
D		+0.38	+0.06	+0.74	+0.02	+0.30
Response to additional K20						
			(±0.301)			(±0.151)
-		+0.58	+1.04	+0.10	+0.52	+0.56
D		0.00	+0.62	+0.32	-0.56	+0.09

* For use in horizontal and diagonal comparisons only

https://doi.org/10.23637/ERADOC-1-160

64/B/4.12

1ST TEST CROP

SUGAR BEET

Plots receiving no additional N or K

Previous rotation

		Ley	Lu	AH	AR	Mean
			ROOTS			
Mean	(±0.696)	17.07	15.18	12.54	16.76	15.39
-	(±0.984)*	16.73	14.63	12.55	15.95	14.96
D		17.41	15.73	12.54	17.56	15.81
Difference	(±1.459)	+0.68	+1.10	-0.01	+1.61	+0.85
			SUGAR PERCENTAGE			
Mean		19.8	20.0	19.6	19.6	19.7
-		19.8	20.1	19.9	19.7	19.9
D		19.8	19.9	19.3	19.4	19.6
Difference		0.0	-0.2	-0.6	-0.3	-0.3
			TOTAL SUGAR			
Mean	(±3.09)	67.7	60.6	49.1	65.6	60.8
-	(±4.38)*	66.3	58.6	49.8	63.2	59.5
D		69.1	62.7	48.5	68.1	62.1
Difference	(±6.56)	+2.8	+4.1	-1.3	+4.9	+2.6
			TOPS			
Mean	(±0.340)	10.03	7.29	7.80	9.36	8.62
-	(±0.480)*	10.27	6.89	7.56	9.30	8.50
D		9.80	7.69	8.03	9.42	8.74
Difference	(±0.643)	-0.47	+0.80	+0.47	+0.12	+0.24

* For use in horizontal and diagonal comparisons only

https://doi.org/10.23637/ERADOC-1-160

64/B/4.13

1ST TEST CROP

SUGAR BEET

Previous rotation

	Ley	Lu	AH	AR	Mean
		ROOTS			
			(±1.546)*		
-	17.25	15.34	13.47	15.81	15.47
P	17.70	15.20	13.43	16.97	15.82
Difference (±0.562)	+0.45	-0.14	-0.04	+1.16	+0.35 (±0.281)
		SUGAR PERCENTAGE			
-	19.6	20.0	19.4	19.5	19.6
P	19.6	19.9	19.4	19.5	19.6
Difference	0.0	-0.1	0.0	0.0	0.0
		TOTAL SUGAR			
			(±7.13)*		
-	67.7	61.3	52.2	61.7	60.8
P	69.3	60.5	52.1	66.2	62.0
Difference (±2.47)	+1.66	-0.8	-0.1	+4.5	+1.2 (±1.24)
		TOPS			
			(±0.575)*		
-	10.55	8.20	8.48	9.07	9.08
P	10.44	7.94	8.25	9.29	8.98
Difference (±0.335)	-0.11	-0.26	-0.23	+0.22	-0.10 (±0.168)

* For use in horizontal and diagonal comparisons only

64/B/4.14

2ND TEST CROP

BARLEY

Previous rotation

		Ley	Lu	AH	AR	Mean
			GRAIN			
-	(±1.36)*	46.2	46.0	42.2	40.8	43.8
D		44.4	44.0	40.0	38.4	41.7
Mean	(±0.95)	45.3	45.0	41.1	39.6	42.7
Difference	(±1.95)	-1.8	-2.0	-2.2	-2.4	-2.1 (±0.97)
			STRAW			
-		33.6	31.7	29.6	30.4	31.3
D		34.0	34.7	29.4	36.6	33.7
6						
Mean		33.8	33.2	29.5	33.5	32.5
Difference		+0.4	+3.0	-0.2	+6.2	+2.4

* For use in horizontal and diagonal comparisons only

Mean D.M.%: Grain 84.4
Straw 83.4

https://doi.org/10.23637/ERADOC-1-160

64/B/5.1

WOBURN MARKET GARDEN EXPERIMENT

(WMG)

Organic manures, N, P and K - Lansome Field 1964, the 23rd year of the experiment, the fourth year with revised treatments.

Carrots: The nitrogen is now applied at none, 0.45, 0.9 cwt N. All fertilisers are applied in the seedbed.
Globe beet: The seed dressing test is discontinued, all seed now being dressed with BHC/organo-mercury dressing. All fertilisers are now applied in the seedbed.

Area of each sub plot: 0.0063. Area harvested: Leeks - 0.0022, carrots - 0.0017, globe beet - 0.0017.

NOTE: The 1964 - 65 leeks grew poorly and were lifted without weighing to clear the ground early in preparation for microplots 1965.

Cultivations, etc.:
Leeks 1963 - 64. Dung and NPK applied: Aug 7, 1963. Second half of NPK applied, leeks planted: Aug 8. Harvested: 1st lifting - Feb 24, 2nd lifting - Mar 23, 1964.
Carrots. Dung applied, plots ploughed: Jan 9, 1964. Fertilisers applied: Apr 2. Seed drilled at 5.5 lb: Apr 3. Sprayed with menazon at 0.7 pints in 60 gals: May 27. Lifted - 1st harvest: July 14, 2nd harvest: Aug 5.
Globe beet. Ground chalk applied at 23 cwt, dung applied, plots ploughed: Apr 15, 1964. Fertilisers applied: Apr 27. Seed drilled at 11 lb: May 4. Sprayed with DDT (Arkotine DDT at 3 pints in 40 gals): May 21. Singled: June 16 - 30. Lifted - 1st harvest: July 22, 2nd harvest: Aug 10.

NOTE: The eight plots on the western side of the experiment were affected by faulty drilling and yields were estimated from reduced areas.

Standard errors per plot.

Carrots: Graded Produce: 1st harvest: 1.307 or 15.0% (11 d.f.)
2nd harvest: 1.909 or 9.9% (11 d.f.)
Mean of 2 harvests: 1.232 or 8.8% (11 d.f.)

Tops: 1st harvest: 1.708 or 17.9% (11 d.f.)
2nd harvest: 1.382 or 12.0% (11 d.f.)
Mean of 2 harvests: 1.177 or 11.2% (11 d.f.)

Globe Beet: Total Produce: 1st lifting: 1.036 or 9.6% (11 d.f.)
2nd lifting: 2.794 or 19.3% (11 d.f.)
Mean of 2 liftings: 1.794 or 14.2% (11 d.f.)

Total Saleable Roots: 1st lifting: 0.671 or 13.4% (11 d.f.)
2nd lifting: 2.103 or 22.1% (11 d.f.)
Mean of 2 liftings: 1.280 or 17.6% (11 d.f.)

https://doi.org/10.23637/ERADOC-1-160

64/B/5.3

SUMMARY OF RESULTS

LEEKS 1963 - 1964. 1ST LIFTING. SALEABLE PRODUCE

Dung	Organic manure applied 1942-61	Mean	Fertiliser None	Fertiliser N1P1K1
10	D1	2.71	2.84	2.58
20	D2	2.64	2.96	2.31
10	C1	2.72	2.56	2.88
20	C2	2.66	3.22	2.11
	D1+C1	2.72	2.70	2.74
	D2+C2	2.65	3.09	2.21
Mean		2.68	2.90	2.47

NPK	
111	2.21
111*	1.91
211	2.01
211*	2.26
112	2.56
112*	2.51
212	0.95
212*	2.56
Mean	2.12

* NPK half ploughed in, half in seedbed.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.4

LEEKS 1963 - 1964. 2ND LIFTING. SALEABLE PRODUCE

Dung	Organic manure applied 1942-61	Mean	Fertiliser None	Fertiliser N1P1K1
10	D1	3.32	3.62	3.02
20	D2	3.60	4.00	3.22
10	C1	3.56	3.30	3.82
20	C2	2.95	3.30	2.61
	D1+C1	3.44	3.46	3.42
	D2+C2	3.28	3.64	2.91
Mean		3.36	3.55	3.16

NPK	
111	2.61
111*	3.12
211	2.76
211*	2.91
112	2.51
112*	3.12
212	2.11
212*	2.96
Mean	2.76

* NPK half ploughed in, half in seedbed.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.5

LEEKS 1963 - 1964. MEAN OF 2 LIFTINGS. SALEABLE PRODUCE

Dung	Organic manure applied 1942-1961	Mean	Fertiliser None	Fertiliser N1P1K1
10	D1	3.01	3.23	2.80
20	D2	3.12	3.48	2.76
10	C1	3.14	2.93	3.35
20	C2	2.81	3.26	2.36
	D1+C1	3.08	3.08	3.08
	D2+C2	2.96	3.37	2.56
Mean		3.02	3.22	2.82

NPK	
111	2.41
111*	2.52
211	2.38
211*	2.58
112	2.54
112*	2.82
212	1.53
212*	2.76
Mean	2.44

* NPK half ploughed in, half in seedbed.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.6

CARROTS. GRADED PRODUCE. ROOTS

Dung	Organic manure applied 1942-62*	Mean	Fertiliser None	Fertiliser N1P1K1
		1ST HARVEST		
		(±0.654)	(±0.924)	
10	D1	8.98	9.85	8.11
20	D2	8.98	7.60	10.36
10	C1	8.15	8.20	8.10
20	C2	9.24	8.25	10.23
		(±0.462)	(±0.654)	
	D1+C1	8.56	9.02	8.10
	D2+C2	9.11	7.92	10.30
Mean		8.84	8.48	9.20
			(±0.462)	

NPK	
111	8.99
211	8.35
112	8.53
212	7.80
Mean	8.42

* Last applied to early potatoes in 1962.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.7

CARROTS. GRADED PRODUCE. ROOTS

Dung	Organic manure applied 1942-62*	Mean	Fertiliser None	Fertiliser N1P1K1
		2ND HARVEST		
		(±0.954)	(±1.350)	
10	D1	18.16	18.75	17.56
20	D2	20.39	20.31	20.47
10	C1	19.60	19.81	19.40
20	C2	20.14	18.69	21.60
		(±0.675)	(±0.954)	
	D1+C1	18.88	19.28	18.48
	D2+C2	20.27	19.50	21.04
Mean		19.57	19.39	19.76
			(±0.675)	

NPK	
111	16.45
211	18.35
112	21.35
212	17.65
Mean	18.45

* Last applied to early potatoes in 1962.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.8

CARROTS. GRADED PRODUCE. ROOTS

Dung	Organic manure applied 1942-62*	Mean	Fertiliser None	Fertiliser N1P1K1
		MEAN OF 2 HARVESTS		
		(±0.616)	(±0.871)	
10	D1	13.56	14.30	12.83
20	D2	14.69	13.96	15.42
10	C1	13.88	14.01	13.75
20	C2	14.69	13.47	15.91
		(±0.436)	(±0.616)	
	D1+C1	13.72	14.16	13.29
	D2+C2	14.69	13.72	15.66
Mean		14.20	13.94 (±0.436)	14.48

NPK	
111	12.72
211	13.35
112	14.94
212	12.72
Mean	13.43

* Last applied to early potatoes in 1962.

64/B/5.9

CARROTS. TOPS

Dung	Organic manure applied 1942-62*	Mean	Fertiliser None	Fertiliser N1P1K1
		1ST HARVEST		
		(±0.854)	(±1.208)	
10	D1	8.82	9.85	7.78
20	D2	12.04	9.29	14.80
10	C1	9.07	7.18	10.96
20	C2	11.46	9.08	13.84
		(±0.604)	(±0.854)	
	D1+C1	8.94	8.52	9.37
	D2+C2	11.75	9.18	14.32
Mean		10.35	8.85 (±0.604)	11.84

NPK	
111	7.02
211	8.00
112	6.46
212	10.00
Mean	7.87

* Last applied to early potatoes in 1962.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.10

CARROTS. TOPS

Dung	Organic manure applied 1942-62*	Mean	Fertiliser None	Fertiliser N1P1K1
		2ND HARVEST		
		(±0.691)	(±0.977)	
10	D1	10.92	11.23	10.61
20	D2	14.88	13.55	16.22
10	C1	11.21	9.91	12.51
20	C2	13.45	12.06	14.84
		(±0.489)	(±0.691)	
	D1+C1	11.06	10.57	11.56
	D2+C2	14.16	12.80	15.53
Mean		12.62	11.69	13.54
			(±0.489)	

NPK	
111	8.23
211	8.52
112	9.15
212	11.36
Mean	9.32

* Last applied to early potatoes in 1962.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.11

CARROTS. TOPS

Dung	Organic manure applied 1942-62*	Mean	Fertiliser None	Fertiliser N1P1K1
		MEAN OF 2 HARVESTS		
		(±0.588)	(±0.832)	
10	D1	9.87	10.54	9.20
20	D2	13.46	11.42	15.51
10	C1	10.14	8.54	11.73
20	C2	12.46	10.57	14.34
		(±0.416)	(±0.588)	
	D1+C1	10.00	9.54	10.46
	D2+C2	12.96	11.00	14.92
Mean		11.48	10.27	12.70
			(±0.416)	

NPK	
111	7.62
211	8.26
112	7.80
212	10.68
Mean	8.59

* Last applied to early potatoes in 1962.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.12

GLOBE BEET. SALEABLE BULBS

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		1ST HARVEST		
		(±0.336)	(±0.474)	
10	D1	4.20	1.62	6.78
20	D2	6.23	5.72	6.75
10	C1	4.83	2.88	6.78
20	C2	6.69	6.65	6.72
		(±0.237)	(±0.336)	
	D1+C1	4.52	2.24	6.78
	D2+C2	6.46	6.18	6.74
Mean		5.49	4.22	6.76
			(±0.237)	

NPK	
111	4.07
211	4.17
112	4.07
212	4.07
Mean	4.10

* Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.13

GLOBE BEET. SALEABLE BULBS

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		2ND HARVEST		
		(±1.052)	(±1.487)	
10	D1	8.58	5.23	11.92
20	D2	11.69	11.21	12.18
10	C1	9.06	6.46	11.66
20	C2	11.92	9.79	14.05
		(±0.744)	(±1.052)	
	D1+C1	8.82	5.85	11.79
	D2+C2	11.81	10.50	13.12
Mean		10.31	8.17 (±0.744)	12.45

NPK	
111	8.88
211	8.79
112	6.23
212.	7.56
Mean	7.86

*Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.14

GLOBE BEET. SALEABLE BULBS

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		MEAN OF 2 HARVESTS		
		(±0.640)	(±0.905)	
10	D1	6.39	3.42	9.35
20	D2	8.96	8.46	9.46
10	C1	6.95	4.67	9.22
20	C2	9.30	8.22	10.38
		(±0.453)	(±0.640)	
	D1+C1	6.67	4.05	9.29
	D2+C2	9.13	8.34	9.92
Mean		7.90	6.19	9.60
			(±0.453)	

NPK	
111	6.48
211	6.48
112	5.15
212	5.82
Mean	5.98

* Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.15

GLOBE BEET. TOTAL PRODUCE

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		1ST HARVEST		
		(±0.518)	(±0.733)	
10	D1	9.22	5.10	13.34
20	D2	13.00	12.08	13.92
10	C1	10.45	7.14	13.76
20	C2	13.65	13.66	13.63
		(±0.366)	(±0.518)	
	D1+C1	9.84	6.12	13.55
	D2+C2	13.32	12.87	13.78
Mean		11.58	9.50	13.66
			(±0.366)	

NPK	
111	8.72
211	9.21
112	9.63
212	9.27
Mean	9.21

*Last applied to Leeks 1961/62.

64/B/5.16

GLOBE BEET. TOTAL PRODUCE

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		2ND HARVEST		
		(±1.397)	(±1.976)	
10	D1	12.99	9.08	16.89
20	D2	17.67	17.18	18.15
10	C1	13.99	10.85	17.12
20	C2	17.78	14.89	20.67
		(±0.988)	(±1.397)	
	D1+C1	13.49	9.96	17.01
	D2+C2	17.72	16.04	19.42
Mean		15.61	13.00	18.21
			(±0.988)	

NPK	
111	13.24
211	13.41
112	10.82
212	11.86
Mean	12.33

* Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.17

GLOBE BEET. TOTAL PRODUCE

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		MEAN OF 2 HARVESTS		
		(±0.897)	(±1.269)	
10	D1	11.10	7.09	15.12
20	D2	15.34	14.63	16.04
10	C1	12.22	9.00	15.44
20	C2	15.72	14.28	17.15
		(±0.634)	(±0.897)	
	D1+C1	11.66	8.04	15.28
	D2+C2	15.53	14.46	16.60
Mean		13.60	11.25	15.94
			(±0.634)	

NPK	
111	10.98
211	11.31
112	10.22
212	10.56
Mean	10.77

* Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.18

GLOBE BEET. PLANT NUMBER

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		1ST HARVEST		
10	D1	123.6	110.3	136.9
20	D2	154.8	159.2	150.5
10	C1	132.6	140.1	125.0
20	C2	143.1	143.8	142.4
	D1+C1	128.1	125.2	131.0
	D2+C2	149.0	151.5	146.4
Mean		138.5	138.4	138.7

NPK	
111	118.4
211	120.1
112	173.4
212	123.3
Mean	133.8

* Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.19

GLOBE BEET. PLANT NUMBER

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		2ND HARVEST		
10	D1	139.5	142.1	136.9
20	D2	166.6	177.4	155.7
10	C1	159.0	172.2	145.9
20	C2	149.6	149.6	149.6
	D1+C1	149.3	157.2	141.4
	D2+C2	158.1	163.5	152.6
Mean		153.7	160.3	147.0

NPK	
111	130.0
211	124.7
112	178.0
212	147.0
Mean	144.9

* Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/5.20

GLOBE BEET. PLANT NUMBER

Dung	Organic manure applied 1942-61*	Mean	Fertiliser None	Fertiliser N1P1K1
		MEAN OF 2 HARVESTS		
10	D1	131.6	126.2	136.9
20	D2	160.7	168.3	153.1
10	C1	145.8	156.2	135.5
20	C2	146.4	146.7	146.0
	D1+C1	138.7	141.2	136.2
	D2+C2	153.6	157.5	149.6
Mean		146.1	149.4	142.9

NPK	
111	124.2
211	122.4
112	175.7
212	135.2
Mean	139.4

* Last applied to Leeks 1961/62.

https://doi.org/10.23637/ERADOC-1-160

64/B/6.1

IRRIGATION EXPERIMENT

(WIR)

Revised 1963

The effects of irrigation and nitrogen - Woburn Butt Close 1964, the 14th year.

For details of previous cropping, treatments etc., see 'Details' 1962.

Sugar beet: The test of early v normal singling was omitted.
Barley: The variety is now Maris Badger.
Clover: The variety is now Dorset Marl double cut red clover.
Lucerne: Plots 73 - 80 failed and were rotary cultivated in mid-season. In view of the incomplete replication remaining no yields are presented.

Area harvested: Sugar beet, sub plot - 0.0102, barley, whole plot - 0.0097, clover, whole plot - 0.0058, lucerne, sub plot - 0.0162.

RAINFALL AND IRRIGATION: INCHES

Week ending	Rain-fall	Barley	Sugar beet			Clover			Lucerne		
		C	A	B	C	A	B	C	A	B	C
May 4	0.77										
11	0.09										
18	0.12	0.50				0.50		0.50			
25	0.44					0.50		0.50	0.50		0.50
June 1	0.25	0.50	0.50		0.50						
8	1.51										
15	0.66										
22	1.28										
29	-										
July 6	-	0.50	0.50		0.50		0.50	0.50		0.50	0.50
13	0.55	0.50	0.50		0.50		0.50	0.50		0.50	0.50
20	0.33				0.50		0.50	0.50			
27	0.09										0.50
Aug 3	0.01			1.50	0.50						
10	0.50										
17	0.12						0.50	0.50			
24	0.16			0.50	1.00		0.50	0.50			1.00
31	0.03						0.50	0.50			
Sept 7	0.10										
14	0.01										
21	0.37										
28	0.62										
Oct 5	-										
Total	8.01	2.00	1.50	2.00	3.50	1.00	3.00	4.00	0.50	1.00	3.00

https://doi.org/10.23637/ERADOC-1-160

Cultivations, etc.:

Sugar beet. Subsoiled: Sept 11, 1963. Ploughed twice: Aug 20 and Jan 2, 1964. Salt applied: Feb 4. Basal compound and sulphate of ammonia applied: Apr 7. Seed drilled at 5lb: Apr 10. Singled, sprayed with DDT at 0.63 lb in 40 gals: May 21. Lifted: Oct 13.

Barley: Ground chalk applied at 44 cwt: Dec 20, 1963. Ploughed: Jan 3, 1964. Basal compound and 'Nitro-Chalk' applied, seed drilled at 2.5 bushels: Feb 14. Clover sown at 30 lb: Apr 27. Sprayed with MCPB/MCPA (New Legumex at 5 pints in 40 gals): May 21. Combine harvested: Aug 21.

Clover: Seed undersown in barley at 30 lb: Apr 18, 1963. Basal compound fertiliser applied: Feb 5, 1964. Cut 3 times: June 11, July 27, Sept 29.

Lucerne: Sprayed with paraquat at 1.6 lb ion in 40 gals: Feb 10, 1964. 'Nitro-Chalk', muriate of potash and basal P applied: Apr 3. Plots 73 - 80 cut (no yields taken) and rotary cultivated twice: May 15 and 27. Cut 4 times: June 9, July 16, Sept 2, Oct 30. Muriate of potash applied after first 3 cuts.

Standard errors per plot.

Sugar beet.	Roots,	Whole plot:	1.421 or 8.6% (6 d.f.)
		Sub plot:	1.592 or 9.7% (8 d.f.)
	Total sugar,	Whole plot:	6.33 or 9.8% (6 d.f.)
		Sub plot:	6.39 or 9.9% (8 d.f.)
	Tops,	Whole plot:	1.738 or 19.4% (6 d.f.)
		Sub plot:	1.364 or 15.3% (8 d.f.)
Barley.	Grain,	Whole plot:	5.15 or 15.3% (5 d.f.)
		Sub plot:	2.57 or 7.6% (10 d.f.)
Clover. Dry matter,			
1st cut.		Whole plot:	2.24 or 7.5% (6 d.f.)
		Sub plot:	2.71 or 9.0% (8 d.f.)
2nd cut.		Whole plot:	2.51 or 11.5% (6 d.f.)
		Sub plot:	2.50 or 11.4% (8 d.f.)
3rd cut.		Whole plot:	0.86 or 12.0% (6 d.f.)
		Sub plot:	0.55 or 7.7% (8 d.f.)
Total of 3 cuts.		Whole plot:	4.29 or 7.3% (6 d.f.)
		Sub plot:	4.81 or 8.1% (8 d.f.)

https://doi.org/10.23637/ERADOC-1-160

64/B/6.3

SUMMARY OF RESULTS

SUGAR BEET

	O	A	B	C	Mean
		ROOTS			
		(1) and (2)			(±0.460)
N1	13.41	13.34	17.48	16.60	15.20
N2	13.75	16.77	19.91	20.17	17.65
Mean (±0.820)	13.58	15.05	18.69	18.39	16.43
		SUGAR %			
N1	20.1	20.1	19.6	19.9	19.9
N2	18.6	19.3	19.3	19.6	19.2
Mean	19.4	19.7	19.5	19.8	19.6

(1) (±0.919) For use in vertical and interaction comparisons only
(2) (±1.047) For use in horizontal and diagonal comparisons only

https://doi.org/10.23637/ERADOC-1-160

64/B/6.4

SUGAR BEET

	O	A	B	C	Mean
TOTAL SUGAR					
		(1) and (2)			(±1.84)
N1	54.0	53.5	68.5	66.1	60.5
N2	51.5	64.7	76.9	79.4	68.1
Mean (±3.66)	52.8	59.1	72.7	72.7	64.3
TOPS					
		(1) and (2)			(±0.394)
N1	5.91	7.09	8.05	7.87	7.23
N2	7.22	9.54	11.94	13.91	10.65
Mean (±1.004)	6.56	8.31	10.00	10.89	8.94

	Total sugar	Tops	
(1)	(±3.69)	(±0.787)	For use in vertical and interaction comparisons only
(2)	(±4.49)	(±1.148)	For use in horizontal and diagonal comparisons only

https://doi.org/10.23637/ERADOC-1-160

64/B/6.5

BARLEY

GRAIN

	O	C	Mean
	(1) and (2)		(±0.74)
N1	28.8	31.0	29.9
N2	37.4	37.6	37.5
Mean (±2.10)	33.1	34.3	33.7

(1) (±1.05) For use in vertical and interaction comparisons only
(2) (±2.23) For use in horizontal and diagonal comparisons only

Mean D.M.%: 83.5

https://doi.org/10.23637/ERADOC-1-160

64/B/6.6

CLOVER

DRY MATTER

	O	A	B	C	Mean
		1ST CUT*			
		(1) and (2)			(±0.78)
N1	29.8	30.9	28.6	33.2	30.6
N2	27.3	28.0	27.0	34.9	29.3
Mean (±1.29)	28.5	29.5	27.8	34.0	30.0

Mean D.M. %: 17.1

		2ND CUT			
		(1) and (2)			(±0.72)
N1	17.1	17.5	28.7	23.6	21.7
N2	18.6	15.1	29.0	25.4	22.0
Mean (±1.45)	17.8	16.3	28.9	24.5	21.9

Mean D.M. %: 18.6

	1ST CUT	2ND CUT	
(1)	(±1.57)	(±1.44)	For use in vertical and interaction comparisons only
(2)	(±1.70)	(±1.77)	For use in horizontal and diagonal comparisons only

*NOTE: 1st cut O = B
A = C

https://doi.org/10.23637/ERADOC-1-160

64/B/6.7

CLOVER

DRY MATTER

	0	A	B	C	Mean
		3RD CUT			
		(1) and (2)			(±0.16)
N1	2.2	3.2	11.9	11.7	7.2
N2	2.4	4.6	10.3	11.6	7.2
Mean (±0.50)	2.3	3.9	11.1	11.6	7.2

Mean D.M. %: 24.1

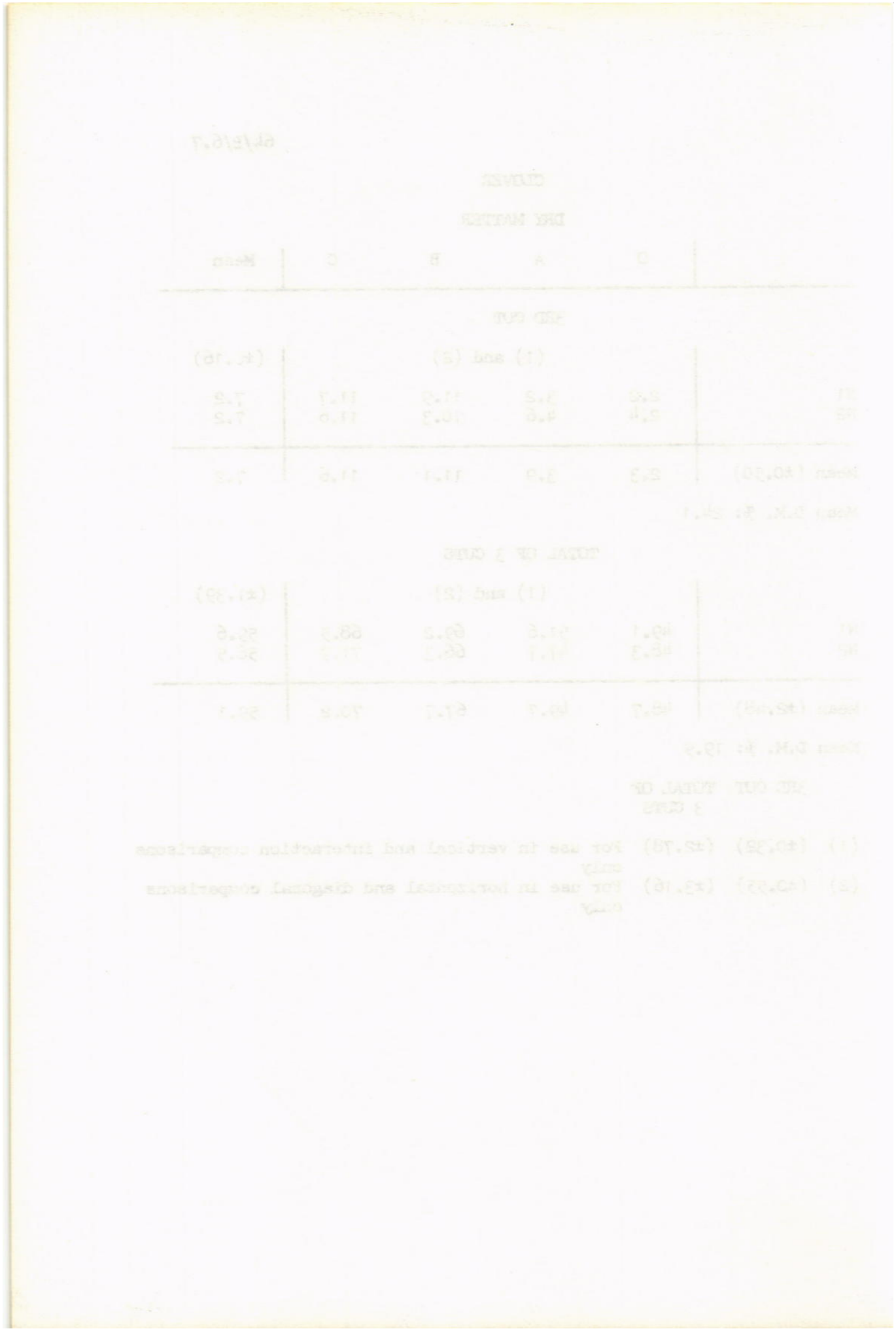
TOTAL OF 3 CUTS

		(1) and (2)			(±1.39)
N1	49.1	51.6	69.2	68.5	59.6
N2	48.3	47.7	66.3	71.9	58.5
Mean (±2.48)	48.7	49.7	67.7	70.2	59.1

Mean D.M. %: 19.9

	3RD CUT	TOTAL OF 3 CUTS	
(1)	(±0.32)	(±2.78)	For use in vertical and interaction comparisons only
(2)	(±0.55)	(±3.16)	For use in horizontal and diagonal comparisons only

https://doi.org/10.23637/ERADOC-1-160



64/B/7.1

RESIDUAL PHOSPHATE ROTATION

(RP)

The long term and residual effects of a number of phosphate fertilisers compared with superphosphate - Great Field IV and Sawyers I 1964, the fifth year.

For treatments and rotation, etc. see 'Results', 63/B/8 and for previous years' results see 60/B/9, 61/B/8, 62/B/8 and 63/B/8.

Area of each plot:
Great Field IV: 0.0193. Area harvested: Potatoes and barley - 0.0129, swedes - 0.0096.
Sawyers I: 0.0212. Area harvested: Potatoes and barley - 0.0141, swedes - 0.0106.

Cultivations, etc. (both fields, except as indicated): Ploughed:
Great Field IV - Dec 9,1963. Sawyers I - Jan 3, 1964.
Potatoes: Ground chalk applied to Great Field IV at 23 cwt: Dec 9, 1963. Fertilisers applied, potatoes planted: May 4, 1964. Sprayed with diquat/paraquat (Preeglone Extra at 2 pints in 40 gals): May 19. Earthed up: June 22. Sprayed twice with mancozeb at 1.2 lb in 35 gals: July 1 and Aug 6. Sprayed with diquat (Reglone at 3 pints in 40 gals): Sept 17. Lifted: Sept 23.
Barley: Ground chalk applied at 23 cwt: Dec 9, 1963. Fertilisers applied, seed drilled at 2 bushels: Feb 13, 1964. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 15. Combine harvested: Aug 20.
Swedes: Ground chalk applied at 23 cwt: Dec 9, 1963. Fertilisers applied: May 19, 1964. Seed drilled at 2 lb: May 21. Singled: July 2. Lifted: Oct 13.

Standard errors per plot.
Sawyers I.
Potatoes, Total tubers: 0.465 or 5.4% (11 d.f.)
Barley, Grain: 1.97 or 4.4% (11 d.f.)
Swedes, Roots: 1.356 or 15.1% (11 d.f.)

https://doi.org/10.23637/ERADOC-1-160

64/B/7.2

SUMMARY OF RESULTS

POTATOES

Treatment	TOTAL TUBERS: Great Mean	Great Field IV Increase	Sawyers I Mean	Sawyers I Increase	PERCENTAGE WARE Great Mean	Great Field IV Increase	Sawyers I Mean	Sawyers I Increase
			(±0.329)	(±0.465)				
1	8.46		8.66		96.7		97.0	
2	9.54	+1.08	9.05	+0.39	94.7	-2.0	95.0	-2.0
3	10.44	+1.98	9.53	+0.87	95.6	-1.1	95.1	-1.9
4	9.34	+0.88	8.41	-0.25	97.1	+0.4	96.9	-0.1
5	7.93	-0.53	8.60	-0.06	93.8	-2.9	94.9	-2.1
6	8.84	+0.38	8.91	+0.25	95.5	-1.2	95.7	-1.3
7	9.75	+1.29	8.57	-0.09	96.9	+0.2	95.8	-1.2
8	8.51	+0.05	8.35	-0.31	95.3	-1.4	95.6	-1.4
9	9.02	+0.56	7.68	-0.98	95.8	-0.9	95.5	-1.5
10	8.25	-0.21	8.45	-0.21	96.5	-0.2	95.0	-2.0
11	8.70	+0.24	8.72	+0.06	97.7	+1.0	95.7	-1.3
12	9.74	+1.28	8.58	-0.08	96.4	-0.3	95.0	-2.0
Mean	9.04		8.63		96.0		95.6	

BARLEY

	GRAIN				STRAW			
			(±1.39)	(±1.97)				
1	40.4		41.7		24.3		26.3	
2	37.2	-3.2	46.2	+4.5	27.0	+2.7	25.6	-0.7
3	36.6	-3.8	42.9	+1.2	24.4	+0.1	24.3	-2.0
4	37.7	-2.7	43.8	+2.1	27.3	+3.0	25.5	-0.8
5	33.2	-7.2	43.9	+2.2	25.1	+0.8	24.9	-1.4
6	37.8	-2.6	46.3	+4.6	25.5	+1.2	26.6	+0.3
7	38.6	-1.8	44.2	+2.5	28.1	+3.8	26.2	-0.1
8	37.6	-2.8	46.5	+4.8	25.8	+1.5	26.4	+0.1
9	40.9	+0.5	45.3	+3.6	25.9	+1.6	25.5	-0.8
10	40.1	-0.3	44.0	+2.3	27.3	+3.0	23.4	-2.9
11	38.0	-2.4	45.9	+4.2	25.3	+1.0	27.1	+0.8
12	35.0	-5.4	46.6	+4.9	29.8	+5.5	27.5	+1.2
Mean	37.8		44.8		26.3		25.8	

Mean D.M.%: 82.2 81.4 87.8 89.3

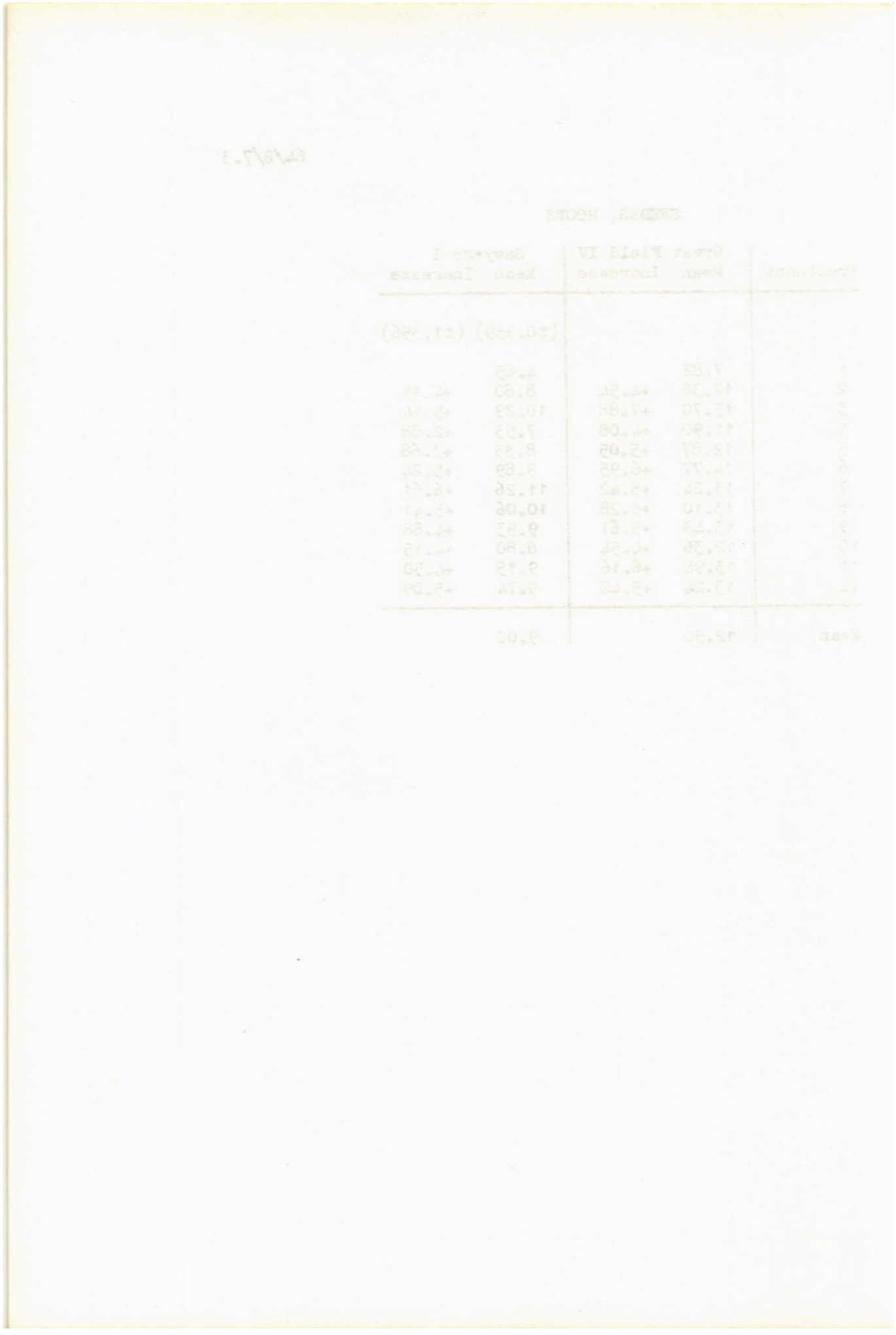
https://doi.org/10.23637/ERADOC-1-160

64/B/7.3

SWEDES, ROOTS

Treatment	Great Field IV Mean	Great Field IV Increase	Sawyers I Mean	Sawyers I Increase
			(±0.959)	(±1.356)
1	7.82		4.65	
2	12.36	+4.54	8.80	+4.15
3	15.70	+7.88	10.29	+5.64
4	11.90	+4.08	7.53	+2.88
5	12.87	+5.05	8.33	+3.68
6	14.77	+6.95	9.89	+5.24
7	13.24	+5.42	11.26	+6.61
8	13.10	+5.28	10.06	+5.41
9	13.43	+5.61	9.53	+4.88
10	12.36	+4.54	8.80	+4.15
11	13.98	+6.16	9.15	+4.50
12	13.24	+5.42	9.74	+5.09
Mean	12.90		9.00	

https://doi.org/10.23637/ERADOC-1-160



https://doi.org/10.23637/ERADOC-1-160

64/B/8.1

N LEVELS AND RESIDUES ROTATION

(NL)

Direct and residual effects of sulphate of ammonia - Long Hoos III, 1964, the fifth and final year.

Rotation: Wheat, potatoes. In 1964, winter wheat only, following potatoes.

Design: 3 x 3 x 3 in 3 blocks of 9 plots each.

Area of each plot: 0.0212. Area harvested: 0.0141.

Treatments: All combinations of:-

N 1964.	None (N0), 0.5 (N1), 1.0 (N2) cwt N.
N to potatoes 1963.	None (NP0), 0.75 (NP1), 1.50 (NP2) cwt N.
N to wheat 1960 & 1962.	None (NW0), 0.5 (NW1), 1.0 (NW2) cwt N.

The nitrogen was applied as sulphate of ammonia. Ground chalk was applied in October 1962 at 1 cwt per cwt of sulphate of ammonia applied in 1960, 1961 and 1962.

Basal dressing: 2.25 cwt 0:14:28 combined drilled.

Cultivations, etc.: Chisel ploughed: Oct 14, 1963. Seed drilled at 3 bushels: Oct 19. Sulphate of ammonia applied, plots sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): Apr 27, 1964. Combine harvested: Aug 25. Variety: Cappelle.

NOTES: (1) For details of the previous years' results see 'Results' 60/B/10, 61/B/9, 62/B/9 and 63/B/9.
(2) If the N levels to potatoes 1961 are included, the design becomes a 1/3 replicate, but no account of this factor has been taken in the analysis.

Standard error per plot. Winter wheat:
Grain: 2.79 or 10.4% (15 d.f.)

https://doi.org/10.23637/ERADOC-1-160

64/B/8.2

SUMMARY OF RESULTS

GRAIN

		NP 0	NP 1	NP 2	NW 0	NW 1	NW 2	Mean
			(±1.61)			(±1.61)		(±0.93)
N	0	19.0	20.3	25.5	20.9	21.0	22.9	21.6
	1	24.5	26.1	25.6	25.7	22.9	27.7	25.4
	2	29.8	35.3	35.6	35.0	32.3	33.4	33.6
NP	0				24.7	23.4	25.2	24.4
	1				25.6	26.8	29.2	27.2
	2				31.2	26.0	29.4	28.9
Mean (±0.93)					27.2	25.4	28.0	26.8

Mean D.M. %: 82.4

64/B/9.1

CULTIVATION - WEEDKILLER ROTATION

(CW)

Gt. Harpenden I 1964 - the 4th year

A comparison of weed control by various cultivation methods and by pre-emergence weedkillers.

For previous history, rotation, treatments etc., see 'Results' 61/B/10, 62/B/10 and 63/B/10.

Area harvested: Spring beans - 0.0110. Winter wheat, potatoes, barley - 0.0107.

Treatments. One plot per block of the 'Reserve' plots was allocated to a new treatment ('A'). For spring-sown crops: no cultivation in autumn or winter, rotary cultivated before sowing. For autumn sown crops: as treatment P. These plots are sprayed as 'X'.

From 1964 it was decided that on all sprayed plots beans would be drilled in rows 10.5 inches apart, on other plots the spacing would be 21 inches as hitherto. In 1964, however, the reserve plots were drilled at 10.5 inches in error, and were sprayed as treatment 'X'.

Weedkillers used on potatoes 1964:-
Prometryne (2 lb) and paraquat (0.75 lb ion) in 40 gals (X).
Linuron (2 lb) and paraquat (0.75 lb ion) in 40 gals (Y).
The earthing up treatment to potatoes is discontinued.
Barley variety 1964 Maris Badger.

Basal dressings: Winter wheat: 2.5 cwt 6:15:15 and 3 cwt 'Nitro-Chalk' in spring. Barley: 2.5 cwt 20:10:10. Potatoes and beans, as 1961.

Operations in 1964

NOTE: Spring beans were sown instead of winter beans.

Cultivations, etc.:
Spring beans: Sprayed with dalapon at 11 lb a.e. in 40 gals: Nov 16, 1963. T plots rigid-tine cultivated twice, P and reserve plots ploughed: Jan 3, 1964. R plots rotary cultivated: Jan 8. P,T and reserve plots spring-tine cultivated: Mar 9. R and A plots rotary cultivated, P, T and reserve plots spring-tine cultivated: Apr 1. Seed drilled at 200 lb: Apr 2. All plots sprayed with simazine: Apr 9. M plots tractor hoed: May 11. M plots chain-harrowed: May 12. Combine harvested: Sept 2.

https://doi.org/10.23637/ERADOC-1-160

Winter wheat: T plots rigid-tine cultivated twice: Nov 21, 1963. P, A and reserve plots ploughed: Nov 27. P,T,A and reserve plots spring-tine cultivated twice, R plots rotary cultivated, seed drilled at 3 bushels: Dec 12. 'Nitro-Chalk' applied: Apr 13, 1964. H sub-plots and reserve plots sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): May 7. Combine harvested: Aug 26.

Potatoes: Sprayed with dalapon at 11 lb a.e. in 40 gals: Nov 16, 1963. T plots rigid-tine cultivated twice: Jan 3, 1964. P and reserve plots ploughed: Jan 6. R plots rotary cultivated: Jan 8. Basal compound fertiliser applied, T,P and reserve plots spring-tine cultivated, A and R plots rotary cultivated: Apr 13. Plot 59 (TM) harrowed and couch grass carted off, P,T and reserve plots spring-tine cultivated, A and R plots rotary cultivated second time, seed machine planted: Apr 14. Ridges rolled: May 5. M plots grubbed and chain harrowed, X and Y plots sprayed: May 12. M plots grubbed: June 11. M plots earthed up: June 12. Sprayed twice with mancozeb at 1.2 lb in 35 gals: July 1 and Aug 7. Sprayed with diquat (Reglone at 4 pints in 40 gals): Sept 5. Lifted: Sept 14.

Barley: Sprayed with sodium trichloracetate at 18 lb in 40 gals: Nov 21, 1963. All plots spring-tine cultivated: Dec 7. Sprayed second time with sodium trichloracetate at 18 lb in 40 gals: Dec 18. All plots spring-tine cultivated: Jan 6, 1964. T plots rigid-tine cultivated twice, P and reserve plots ploughed, R plots rotary cultivated: Jan 14. All plots except R and A plots spring-tine cultivated: Mar 9. R and A plots rotary cultivated, P, T and reserve plots harrowed: Mar 10. Seed drilled at 2.75 bushels: Mar 11. Rolled: Mar 12. H sub-plots and reserve plots sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 14. Combine harvested: Aug 12.

Standard errors per plot.

Spring beans, grain:	Whole plot:	2.16 or 7.9% (11 d.f.)
Winter wheat, grain:	Whole plot:	3.73 or 8.4% (8 d.f.)
	Sub plot:	2.16 or 4.9% (9 d.f.)
Potatoes, total tubers:	Whole plot:	1.084 or 10.6% (8 d.f.)
Barley, grain:	Whole plot:	1.24 or 2.5% (11 d.f.)
	Sub plot:	2.48 or 4.9% (12 d.f.)

NOTE: Potatoes. On plot 59(TM) there was a heavy infestation of twitch (Agropyron repens) and a very heavy infestation of chickweed (Stellania media).

https://doi.org/10.23637/ERADOC-1-160

64/B/9.3

SUMMARY OF RESULTS

	P	R	T	Mean
SPRING BEANS				
GRAIN				
Mean (±0.88)	27.9	26.6	27.4	27.3
M (±1.53)	29.7	28.9	29.1	29.2 (±0.88)
X (±1.08)	27.0	25.5	26.6	26.4 (±0.62)
	A X 27.8	Reserve X 28.0		

General mean: 27.5

Mean D.M.%: 86.6

WINTER WHEAT				
GRAIN				
Mean (±1.52)	44.8	45.1	43.0	44.3
1963		(±2.64)		(±1.52)
M	44.6	45.0	43.5	44.3
X	43.1	43.9	42.7	43.2
Y	46.8	46.4	43.0	45.4
1964		(1) and (2)		(±0.51)
-	46.4	45.0	43.2	44.8
H	43.2	45.2	42.9	43.8
	A - 46.5	A H 42.3	Reserve H 41.2	

General mean: 43.8
Mean D.M.%: 87.3

(1) (±0.88) For use in vertical and interaction comparisons
(2) (±1.65) For use in horizontal and diagonal comparisons

https://doi.org/10.23637/ERADOC-1-160

POTATOES

	P	R	T	Mean
TOTAL TUBERS				
Mean (±0.442)	10.77	9.84	10.09	10.23
		(±0.766)		(±0.442)
M	10.60	9.11	7.73	9.15
X	10.61	10.35	10.30	10.42
Y	11.09	10.08	12.23	11.13
	A X 9.68	Reserve 11.12		

General mean: 10.34

% WARE				
Mean	90.8	88.9	89.8	89.8
M	89.8	87.9	86.5	88.0
X	91.0	89.7	90.3	90.3
Y	91.7	89.2	92.7	91.2
	A X 84.9	Reserve 92.0		

General mean: 89.8

https://doi.org/10.23637/ERADOC-1-160

64/B/9.5

BARLEY

GRAIN

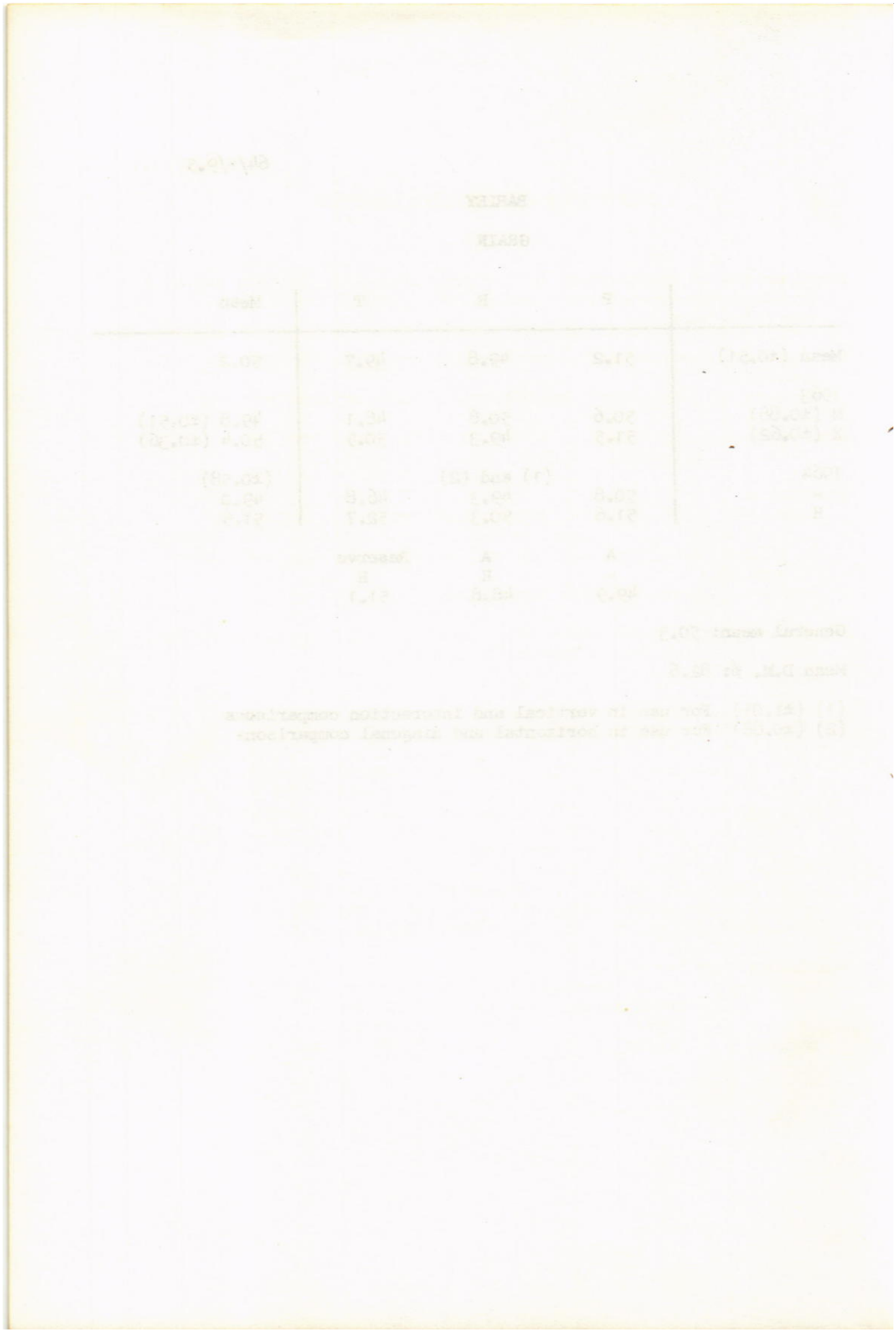
	P	R	T	Mean
Mean (±0.51)	51.2	49.8	49.7	50.2
1963				
M (±0.88)	50.6	50.8	48.1	49.8 (±0.51)
X (±0.62)	51.5	49.3	50.5	50.4 (±0.36)
1964		(1) and (2)		(±0.58)
-	50.8	49.3	46.8	49.0
H	51.6	50.3	52.7	51.5
	A	A	Reserve	
	-	H	H	
	49.9	48.8	51.1	

General mean: 50.3

Mean D.M. %: 82.6

(1) (±1.01) For use in vertical and interaction comparisons
(2) (±0.88) For use in horizontal and diagonal comparisons

https://doi.org/10.23637/ERADOC-1-160



https://doi.org/10.23637/ERADOC-1-160

CULTIVATION - WEEDKILLER ROTATION

(WCW)

A comparison of weed control by various cultivation methods and by a pre-emergence weedkiller - Woburn Great Hill I and II 1964, the fifth year.

For history, rotation etc., see 'Results' 60/B/11, 61/B/11, 62/B/11 and 63/B/11.
Because of potato cyst nematode sugar beet replaces potatoes.

Area of each plot: 0.0482. Area harvested: Sugar beet - roots - 0.0121, tops - 0.0040, barley - 0.0115.

Treatments:
Sugar beet: Ploughed (P), rotary cultivated (R), rigid-tine cultivated (T). Normal mechanical cultivations after sowing. (Three plots per block for each treatment). No weedkiller applied.
Barley: P, R and T as for sugar beet.

Basal dressing. Sugar beet: 5 cwt agricultural salt, 6 cwt 20:10:10.
Barley: 3.5 cwt 16:9:9 combine drilled.

Cultivations, etc.:
Both crops: T plots rigid-tine cultivated twice, P plots ploughed, R plots rotary cultivated: Dec 2, 1963.
Sugar beet: Salt applied: Feb 4, 1964. T and P plots spring-tine cultivated: Feb 25. Basal NPK compound applied: Apr 6. T and P plots spring-tine cultivated: Apr 9. R plots rotary cultivated second time, all plots harrowed: Apr 10. Seed drilled at 5 lb: Apr 11. Singled: May 28. Lifted: Oct 14. Variety: Klein E.
Barley: All plots harrowed: Feb 14, 1964. Seed drilled at 2.5 bushels: Feb 15. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 12. Combine harvested: Aug 26. Variety: Maris Badger.

Standard errors per plot.

Sugar beet.	Roots (washed):	0.978	or 7.9% (14 d.f.)
	Total sugar:	4.39	or 8.2% (14 d.f.)
	Tops:	0.750	or 12.2% (14 d.f.)
Barley.	Grain:	4.16	or 26.0% (14 d.f.)

https://doi.org/10.23637/ERADOC-1-160

64/B/10.2

SUMMARY OF RESULTS

P	R	T	Mean
	SUGAR BEET		
	ROOTS		
	(±0.399)		
12.27	12.46	12.20	12.31
	SUGAR %		
21.7	22.1	21.7	21.8
	TOTAL SUGAR		
	(±1.79)		
53.2	55.1	53.0	53.7
	TOPS		
	(±0.306)		
6.33	6.19	5.93	6.15
	BARLEY		
	GRAIN		
	(±1.70)		
16.4	14.7	16.9	16.0

Mean D.M. %: 87.6

https://doi.org/10.23637/ERADOC-1-160

64/B/11.1

GRAZED REFERENCE PLOTS

(RG)

The effects of fertilisers on old grass, grazed and occasionally hayed - Highfield IX, 1959 - 1964.

Design: 4 randomised blocks of 14 plots each.

Area of each plot: 0.0079. Area harvested: 0.0002.

Treatments: All combinations of:-

1. Nitrogen*: None (N0), 1.5 cwt N as calcium nitrate (N1), 1.5 cwt N as sulphate of ammonia (A1).
2. Phosphate*: None (P0), 1.0 cwt P2O5 (P1), as granular superphosphate (G) (Blocks I and III) and as triple superphosphate (T) (Blocks II and IV).
3. Potash*: None (K0), 2.0 cwt K2O (K1) as muriate of potash.

In addition 2 plots per block were manured as follows:- N2P1K1 and A2P1K1 where N2 and A2 are 3 cwt N as calcium nitrate and sulphate of ammonia respectively.

Plots receiving sulphate of ammonia received also 7.5 (A1 plots) and 15 cwt (A2 plots) calcium carbonate in 1964.

* The rates have varied as follows:-

1959 and 1960: 1.0 (A1 and N1), 2.0 (A2 and N2) cwt N, 0.5 cwt P2O5 (P1), 1.0 cwt K2O (K1).

1961: 4 cwt P2O5 (P1), 3.0 cwt K2O (K1).

Basal dressing: None.

Cultivations, etc.:

1964: Ground chalk applied to appropriate plots: Nov 28, 1963. P and K fertilisers applied: Dec 10. First N dressings applied: Mar 20, 1964. Sample cuts taken 4 times: May 13, June 29, Sept 1, Oct 27. N dressings applied after first 3 cuts. From the beginning of the experiment the field was grazed extensively, with some quite short intervals, by sheep and cattle. In 1964 cages were placed on all plots to protect the sampling area from grazing. The cages were moved after each cut. The yields are estimated from these samples.

Standard errors per plot. Dry matter:

1st cut:	2.05 cwt or 12.4% (26 d.f.)
2nd cut:	2.93 cwt or 7.0% (26 d.f.)
3rd cut:	5.29 cwt or 15.4% (26 d.f.)
4th cut:	3.86 cwt or 42.5% (26 d.f.)
Total of 4 cuts:	8.15 cwt or 8.0% (26 d.f.)

https://doi.org/10.23637/ERADOC-1-160

64/B/11.2

SUMMARY OF RESULTS

DRY MATTER

	PK	Granular	Triple	Mean
		1ST CUT		
		(±1.45)*		(±1.03)
N0	00	8.0	11.4	9.7
N1	00	15.0	15.0	15.0
A1	00	14.0	15.8	14.9
N0	10	11.7	11.4	11.5
N1	10	19.3	17.7	18.5
A1	10	21.0	21.7	21.4
N0	01	13.4	12.6	13.0
N1	01	17.3	14.6	15.9
A1	01	17.7	19.5	18.6
N0	11	12.7	15.0	13.8
N1	11	22.6	21.2	21.9
A1	11	23.9	20.0	21.9
N2	11	20.8	17.4	19.1
A2	11	21.9	14.4	18.1
Mean		17.1	16.2	16.7
		2ND CUT		
		(±2.07)*		(±1.46)
N0	00	29.6	31.4	30.5
N1	00	37.7	39.9	38.8
A1	00	40.4	40.8	40.6
N0	10	28.0	29.4	28.7
N1	10	42.8	49.2	46.0
A1	10	43.1	46.0	44.5
N0	01	34.3	35.5	34.9
N1	01	41.8	48.7	45.2
A1	01	40.3	48.2	44.2
N0	11	35.4	41.7	38.5
N1	11	48.5	49.2	48.8
A1	11	44.7	45.9	45.3
N2	11	52.0	54.5	53.2
A2	11	48.6	50.6	49.6
Mean		40.5	43.6	42.1

Mean D.M.%: 1st cut: 18.8
2nd cut: 21.1

*For use in vertical and interaction comparisons only.

https://doi.org/10.23637/ERADOC-1-160

64/B/11.3

DRY MATTER

	Granular	Triple	Mean
		3RD CUT	
PK		(±3.74)*	(±2.64)
N0 00	25.5	22.8	24.1
N1 00	32.2	33.8	33.0
A1 00	31.8	34.5	33.1
N0 10	24.6	23.2	23.8
N1 10	36.8	33.2	35.0
A1 10	26.2	35.9	31.0
N0 01	42.7	25.8	34.2
N1 01	34.2	35.7	34.9
A1 01	37.1	31.1	34.1
N0 11	34.4	30.4	32.4
N1 11	36.9	38.4	37.6
A1 11	35.5	42.5	39.0
N2 11	43.0	43.8	43.4
A2 11	44.5	46.7	45.6
Mean	34.7	34.1	34.4
		4TH CUT	
		(±2.73)*	(±1.93)
N0 00	3.9	5.7	4.8
N1 00	10.6	13.1	11.8
A1 00	12.4	11.6	12.0
N0 10	4.4	9.0	6.7
N1 10	9.6	10.4	10.0
A1 10	6.9	15.0	10.9
N0 01	8.1	3.4	5.8
N1 01	9.2	10.7	10.0
A1 01	8.4	9.5	8.9
N0 11	5.0	3.0	4.0
N1 11	10.8	11.5	11.1
A1 11	10.8	14.2	12.5
N2 11	9.0	10.0	9.5
A2 11	11.3	7.9	9.6
Mean	8.6	9.6	9.1

Mean D.M.%: 3rd cut: 31.4
4th cut: 31.4

*For use in vertical and interaction comparisons only.

https://doi.org/10.23637/ERADOC-1-160

64/B/11.4

DRY MATTER

TOTAL OF 4 CUTS

		Granular	Triple	Mean
			(±5.76)*	(±4.08)
	PK			
N0	00	67.0	71.2	69.1
N1	00	95.3	101.8	98.6
A1	00	98.6	102.6	100.6
N0	10	68.6	72.9	70.8
N1	10	108.4	110.4	109.4
A1	10	97.1	118.6	107.8
N0	01	98.4	77.2	87.8
N1	01	102.5	109.6	106.1
A1	01	103.4	108.2	105.8
N0	11	87.4	90.0	88.7
N1	11	118.8	120.2	119.5
A1	11	114.8	122.6	118.8
N2	11	124.7	125.6	125.2
A2	11	126.2	119.6	122.9
Mean		100.8	103.6	102.2

Mean D.M. %: 25.7

*For use in vertical and interaction comparisons only.

https://doi.org/10.23637/ERADOC-1-160