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Yields of the Field Experiments 1964

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Annual Experiments

Rothamsted Research

Rothamsted Research (1965) *Annual Experiments ;* Yields Of The Field Experiments 1964, pp 201 - 245 **- DOI: https://doi.org/10.23637/ERADOC-1-160**

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64/Da/1.1

WINTER WHEAT

(RW 101 and WW 101)

N-serve - Rothamsted (R) Great Knott II and Woburn (W) Lansome Field 1964.

Design (each field): 3 randomised blocks of 14 plots each.

Area of each plot:	Area harvested:
Great Knott II (R): 0.0161	0.0133
Lansome Field (W): 0.0116	0.0077

Treatments: No nitrogen (0) (2 plots per block) and all combinations of:-

1. Materials and time of application: Sulphate of ammonia treated with 'N-serve' at none (A), 1% (AS1), 2% (AS2) of N applied, placement drilled in autumn (P)
   Sulphate of ammonia treated with N-serve at none (A) or 1% (AS1) of N, broadcast in spring (B)
   Calcium nitrate broadcast in spring (CB).

2. Levels of N: (R) 50 (1) and 100 (2) lb per acre
   (W) 75 (1) and 150 (2) lb per acre.

Basal dressing: Great Knott II (R): 2.5 cwt 0:20:20 broadcast
Lansome Field (W): 3.0 cwt 0:20:20 broadcast.

Cultivations, etc.:

Great Knott II (R): Chisel ploughed 3 times: Oct 24, 1963. Seed drilled, basal dressing applied: Oct 28. Spring nitrogen applied: Apr 27, 1964. Sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): Apr 30. Combine harvested: Aug 27. Variety: Cappelle. Previous crops: Spring beans 1962, potatoes 1963.

Lansome Field (W): Ploughed: Oct 7, 1963. Seed drilled, basal dressing applied: Oct 17. Spring nitrogen applied: Apr 24, 1964. Sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): Apr 30. Combine harvested: Aug 29. Variety: Cappelle. Previous crops: Sugar beet 1962, carrots 1963.

NOTE: Plant samples were taken during growth of the crop in order to measure N uptake.

Standard errors per plot. Grain:
Great Knott II (R): 2.660 or 5.1% (27 d.f.)
Lansome Field (W): 1.536 or 4.1% (27 d.f.)

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64/Da/1.2

SUMMARY OF RESULTS

GRAIN

	ROTHAMSTED		WOBURN	
	Mean	Increase	Mean	Increase
0	45.8 (±1.09)	(±1.88)	16.9 (±0.63)	(±1.09)
A1 P	51.0	+5.2	25.7	+8.8
A1 S1 P	50.8	+5.0	28.4	+11.5
A1 S2 P	55.0	+9.2	299.9	+13.0
A2 P	53.7	+7.9	37.5	+20.6
A2 S1 P	53.9	+8.1	43.3	+26.4
A2 S2 P	55.4 (±1.54)	+9.6	42.3 (±0.89)	+25.4
A1 B	52.3	+6.5	38.2	+21.3
A1 S1 B	52.4	+6.6	36.7	+19.8
C1 B	52.4	+6.6	45.7	+28.8
A2 B	56.0	+10.2	54.0	+37.1
A2 S1 B	56.9	+11.1	51.5	+34.6
C2 B	55.6	+9.8	51.9	+35.0
Mean	52.6		37.1	
Mean D.M. %:	86.9		86.9	

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64/Da/2.1

WINTER WHEAT

(RW 401 and WW 201)

Row spacing, seed rates and N - Rothamsted (R) Great Knott II and Woburn (W) Horsepool 1964.

Design (each field): 4 randomised blocks of 8 plots each, plots being divided into 3 for the application of N.

Area of each sub plot: 0.0045.

Treatments. All combinations of:-
Whole plot. Row spacing: Seed and NPK* broadcast (B), seed drilled at 4 inches between rows, NPK broadcast (C), seed drilled, 7 inch rows, NPK broadcast (W), seed drilled, 7 inch rows, NPK combine drilled (W*).
Seed rates: 2 (L), 3.5 (H) bushels.
Sub plots. Nitrogen: 0.4 (N1), 0.8 (N2), 1.2 (N3) cwt N as 'Nitro-Chalk' broadcast in spring.

* (6:15:15) to all plots - rate 311 lb.

Cultivations, etc.:
Great Knott II (R). Chisel ploughed 3 times: Oct 24 - 26, 1963. Seed sown, NPK compound applied: Oct 30. 'Nitro-Chalk' applied: Apr 11, 1964. Sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): Apr 30. Combine harvested: Aug 27. Variety: Cappelle. Previous crops: Spring beans 1962, potatoes 1963.
Horsepool (W). Ploughed: Oct 31, 1963. Seed sown, NPK compound applied: Nov 13. 'Nitro-Chalk' applied: Mar 26, 1964. Sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): Apr 30. Combine harvested: Aug 28. Variety: Cappelle. Previous crops: Kale 1962, potatoes 1963.

Standard errors per plot. Grain:

Great Knott II (R)	Whole plot:	2.41 or 4.7% (21 d.f.)
	Sub plot:	3.70 or 7.3% (48 d.f.)
Horsepool (W)	Whole plot:	2.17 or 4.3% (21 d.f.)
	Sub plot:	3.32 or 6.6% (46 d.f.)

NOTES: (1) Horsepool (W). Because of a breakdown during combine harvesting the yields from 2 sub plots 215a and 215b (treatments W*LN2 and W*LN3) were lost. Estimated values were used in the analysis.
(2) Emergence counts were made on Dec 11, 1963 on Great Knott II (R) and on Feb 5, 1964 on Horsepool (W).

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64/Da/2.2

SUMMARY OF RESULTS

GRAIN

ROTHAMSTED

	B	C	W	W*	Mean
		(±1.20)			(±0.60)
L	52.0	50.3	50.0	51.0	50.8
H	49.7	51.2	52.1	49.9	50.7
		(1) and (2)			(±0.65)
N1	48.4	48.1	47.7	48.6	48.2
N2	51.5	52.5	51.8	51.0	51.7
N3	52.6	51.7	53.7	51.7	52.4
Mean (±0.85)	50.9	50.7	51.1	50.4	50.8

	L	H
	(3) and (4)	
N1	48.3	48.1
N2	50.7	52.7
N3	53.6	51.3

Mean D.M. %: 87.3

(1) ±1.85 (3) ±1.31. For use in vertical and interaction comparisons.

(2) ±1.93 (4) ±1.37. For use in horizontal and diagonal comparisons.

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64/Da/2.3

GRAIN

WOBURN

	B	C	W	W*	Mean
		(±1.09)			(±0.54)
L	49.7	53.0	49.7	50.8	50.8
H	46.9	52.0	50.0	50.3	49.8
		(1) and (2)			(±0.59)
N1	49.4	55.7	51.6	52.7	52.3
N2	49.1	51.7	49.6	49.5	50.0
N3	46.3	50.0	48.2	49.6	48.5
Mean (±0.77)	48.3	52.5	49.8	50.6	50.3

	L	H
	(3) and (4)	
N1	53.0	51.7
N2	50.1	49.9
N3	49.3	47.8

Mean D.M.%: 86.8

(1) ±1.17 (3) ±0.83. For use in vertical and interaction comparisons.

(2) ±1.23 (4) ±0.87. For use in horizontal and diagonal comparisons.

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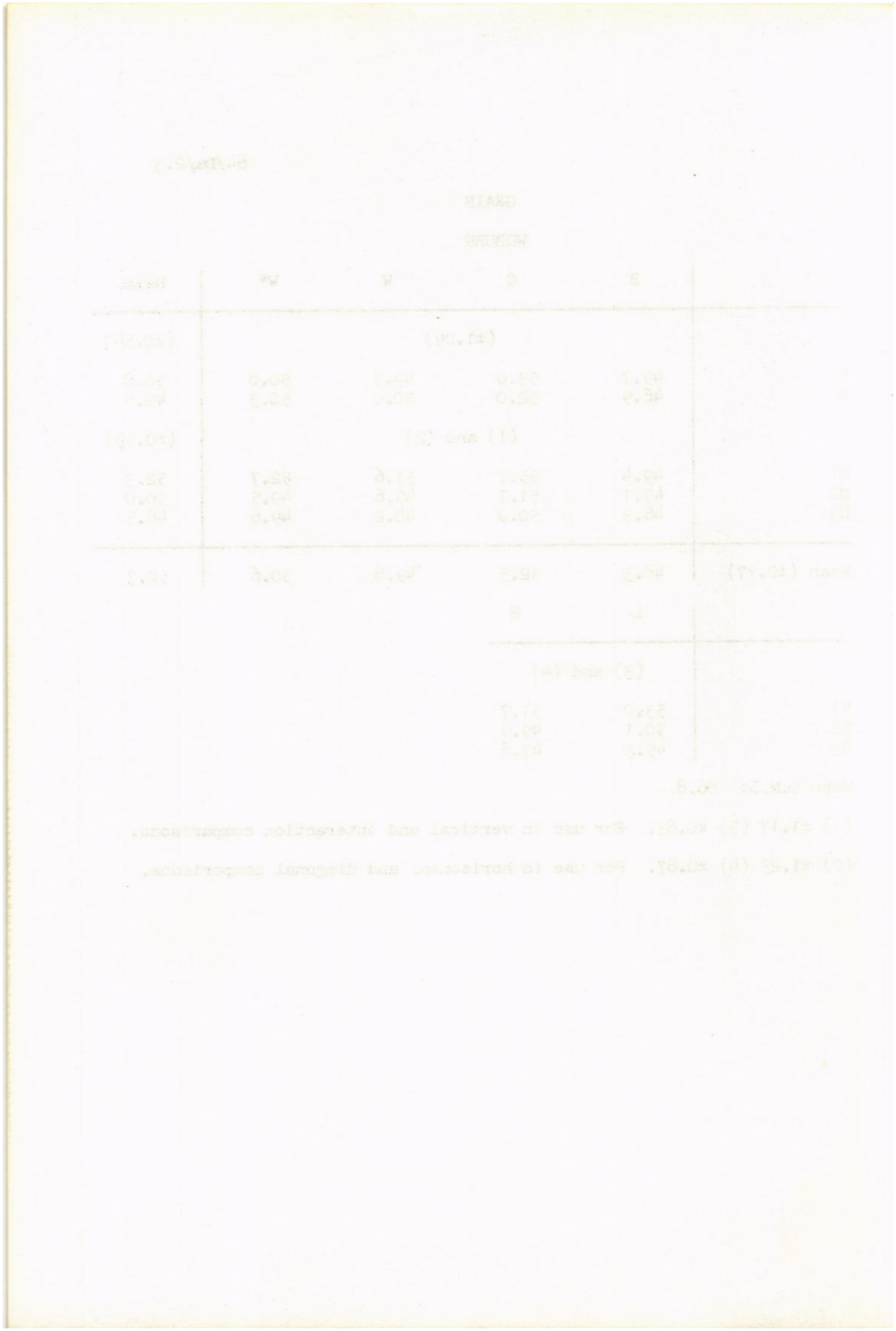

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64/Da/3.1

SPRING WHEAT

(WW 301)

'Scorch' study - Woburn Butt Close 1964.

Design: 2 replicates of 2 x 2 x 2 x 3 in 4 blocks of 12 plots each.

Area of each plot: 0.0032. Area harvested: 0.0014.

Treatments. All combinations of:-

1. Fumigant: None (F0), sprayed twice with formalin (F) on Dec 16, 1963 and Feb 21, 1964. 266 gals formalin (38% formaldehyde) in 3.700 gals water, on each occasion.
2. Fungicide: None (S0), sprayed with nabam 3 times (S) - at 10 lb nabam in seedbed, at 5 lb on May 7 (3-4 leaf stage), at 5 lb in late May (at ground cover stage). Each application in 100 gals.
3. Irrigation: None (W0), irrigated (W).
4. Nitrogen: 0.6 (N1), 1.2 (N2), 1.8 (N3) cwt N as 'Nitro-Chalk', applied half in seedbed, half on May 6.

Basal dressing: 2.5 cwt 0:20:20.

Cultivations, etc.: Ploughed: Oct 2, 1963. Seedbed N and all PK applied: Feb 20, 1964. Seed sown at 2.5 bushels: Mar 26. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 50 gals): May 14. W plots irrigated 10 times - 0.25 in: May 19, 0.75 in: May 26, 0.17 in: June 4, 0.375 in: June 15, 0.50 in: June 30, 0.25 in: July 3, 0.375 in: July 6, 0.5 in: July 14, 0.75 in: July 20, 0.75 in: July 28. Harvested: Aug 25. Variety: Jufy I. Previous crops: Spring beans 1962, winter wheat 1963.

NOTE: Green crop samples were taken at fortnightly intervals from early June to mid-July.

Standard error per plot.
Grain: 2.66 or 11.5% (22 d.f.)

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64/Da/3.2

SUMMARY OF RESULTS

GRAIN

	F0	F	S0	S	W0	W	Mean
	(±0.77)						
S0	14.7	30.9					
S	16.1	30.7					
	(±0.77)		(±0.77)				
W0	13.0	27.3	20.4	19.9			
W	17.8	34.3	25.2	26.9			
	(±0.94)		(±0.94)		(±0.94)		(±0.66)
N1	10.3	28.1	18.7	19.7	17.7	20.8	19.2
N2	16.7	33.1	25.3	24.5	22.1	27.8	24.9
N3	19.1	31.1	24.3	26.0	20.7	29.6	25.1
Mean (±0.54)	15.4	30.8	22.8	23.4	20.1	26.0	23.1

Mean D.M. %: 88.5

STRAW

S0	24.1	45.4					
S	26.5	44.1					
W0	22.7	41.3	31.8	32.1			
W	27.9	48.3	37.7	38.5			
N1	16.0	39.8	27.1	28.6	26.0	29.7	27.9
N2	26.6	46.5	36.8	36.3	34.1	39.0	36.6
N3	33.3	48.0	40.4	40.9	35.7	45.6	40.7
Mean	25.3	44.8	34.8	35.3	32.0	38.1	35.0

Mean D.M. %: 89.9

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64/Da/4.1

SPRING WHEAT

(RW 501)

Effects of CCC* - Pastures 1964.

Design: 4 randomised blocks of 9 plots each.

Area of each plot: 0.0067. Area harvested: 0.0008.

Treatments: All combinations of:-
1. CCC* in spray at 67 gals: None (0), 2.5 lb (S), 5.0 lb (D).
2. Nitrogen: 0.25 (N1), 0.75 (N3), 1.25 (N5) cwt N as 'Nitro-Chalk'.

* 2-chloroethyltrimethylammonium chloride - a dwarfing compound.

Basal dressing: 1.5 cwt compound 0:20:20 combine drilled.

Cultivations, etc.: Ploughed: Feb 27, 1964. Seed drilled at 4.5 bushels: Mar 13. 'Nitro-Chalk' applied: Mar 31. CCC sprays applied: May 13. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 15. Yields estimated by sampling: Aug 24. Variety: Phoebus. Previous crops: 7 year grass and clover ley.

NOTE: Samples were taken for growth analysis at 5 leaf stage, then 3 weeks later, and at ear emergence, and at harvest. Grain yields were estimated by sampling.

Standard error per plot.
Grain: 2.79 or 6.8% (24 d.f.)

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64/Da/4.2

SUMMARY OF RESULTS

	N1	N3	N5	Mean
GRAIN				
		(±1.39)		(±0.80)
O	35.5	40.5	43.2	39.7
S	36.6	43.2	45.4	41.8
D	37.3	44.7	44.5	42.1
Mean (±0.80)	36.5	42.8	44.4	41.2
STRAW				
O	39.7	50.6	53.2	47.8
S	30.1	39.8	45.5	38.5
D	31.6	43.9	45.6	40.4
Mean	33.8	44.8	48.1	42.2

Mean D.M. %: Grain 88.4

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64/Da/5.1

SPRING WHEAT

(RW 601)

Dates of sowing and N - Pastures 1964.

Design: 6 x 6 Latin square.

Area of each plot: 0.0145. Area harvested: 0.0008.

Treatments: All combinations of:-
1. Sowing dates: Mar 11, 1964 (E), Apr 2 (M), Apr 28 (L).
2. Levels of nitrogen: None (0), 0.6 (N) N as 'Nitro-Chalk' in seedbed.

Basal dressing: 1.5 cwt 0:20:20 combine drilled.

Cultivations, etc.: Ploughed: Feb 27, 1963. 'Nitro-Chalk' applied: For 1st sowing - Mar 31, 1964, for 2nd sowing - Apr 3, for 3rd sowing - Apr 27. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): 1st sowing - May 15, 2nd sowing - May 29, 3rd sowing - June 10 (all at 3 bushels). Yields estimated by sampling: Aug 27. Variety: Opal. Previous crop: 7 year ley.

NOTE: Samples for crop growth and yield were taken at fortnightly intervals from ear emergence to harvest.

Standard error per plot.
Grain: 3.61 or 10.3% (20 d.f.)

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64/Da/5.2

SUMMARY OF RESULTS

GRAIN

	E	M	L	Mean
		(±1.47)		(±0.85)
0	35.4	34.0	28.4	32.6
N	41.6	40.4	29.6	37.2
Mean (±1.04)	38.5	37.2	29.0	34.9

Mean D.M. %: 89.3

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64/Da/6.1

WHEAT

(RW 301)

Varieties and nitrogen - Claycroft 1964.

Design: 4 randomised blocks of 21 plots each, blocks being divided into 2 sub-blocks each, one of 12 winter and one of 9 spring wheat plots.

Area of each plot: 0.0192. Area harvested: 0.0129.

Treatments. All combinations of:-

1. Varieties: Winter wheat: Cappelle (Ca), Prestige (Pr), Rothwell Perdix (Rp), Squarehead's Master 13/4 (Sq).
   Spring wheat: Jufy I (Ju), Opal (Op), Prestige (Pr).
2. Nitrogen: 0.5 (N1), 0.75 (N2), 1.0 (N3) cwt N broadcast in spring.

Basal dressing (combine drilled): 280 lb compound fertiliser (6: 15: 15) to winter wheat, 210 lb compound fertiliser (0: 20: 20) to spring wheat.

Cultivations, etc.: Ploughed: Nov 22 - Dec 4, 1963. Winter wheat drilled at 3 bushels: Dec 10. Spring wheat drilled at 3 bushels: Mar 11, 1964. 'Nitro-Chalk' applied: Spring wheat - Apr 1, Winter wheat - Apr 25. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gallons): May 9. Combine harvested: Aug 28. Previous crops: Winter and spring wheat 1962, spring beans 1963.

NOTE: One plot of spring wheat (Ju N2) was affected by bird damage at germination - an estimated value was used in the analysis.

Standard errors per plot. Grain:
Winter wheat: 2.87 or 6.3% (33 d.f.)
Spring wheat: 1.94 or 5.2% (23 d.f.)

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SUMMARY OF RESULTS

GRAIN

WINTER WHEAT

	Ca	Pr	Rp	Sq	Mean
		(±1.44)			(±0.72)
N1	48.7	41.6	56.6	38.5	46.4
N2	47.7	42.3	60.2	35.4	46.4
N3	48.0	39.5	58.8	33.6	45.0
Mean (±0.83)	48.2	41.1	58.5	35.8	45.9

Mean D.M. %: 86.1

SPRING WHEAT

	Ju	Op	Pr	Mean
		(±0.97)		(±0.56)
N1	39.3	45.5	30.8	38.5
N2	35.6	43.2	29.9	36.2
N3	35.4	43.2	31.0	36.6
Mean (±0.56)	36.8	44.0	30.6	37.1

Mean D.M. %: 85.9

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64/Db/1.1

BARLEY

(RB 101 and WB 101)

Varieties and N - Rothamsted (R) Great Knott III and Woburn (W) Butt Close 1964.

Design: 4 randomised blocks of 7 plots each, plots being split into 3 for application of N.

Area of each sub-plot:		Area harvested:
Great Knott III (R):	0.0096	0.0064
Butt Close (W):	0.0112.	-

Treatments. All combinations of:-

1. Varieties: Sown at 2.75 bushels: Plumage Archer (A), Maris Badger (B), Cambrinus (C), Europa (E), Impala (I), Proctor (P), Sown at 2.25 bushels: Proctor (PL).
2. Nitrogen: 0.3 (N1), 0.6 (N2), 0.9 (N3) cwt N as 'Nitro-Chalk'.

Basal dressing: 2 cwt (0:20:20) combine drilled.

Cultivations, etc.:

Great Knott III (R). Ploughed twice: Sept 26 - Nov 26, 1963 and Jan 6, 1964. Seed drilled: Mar 9. 'Nitro-Chalk' applied: Mar 26. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 14. Combine harvested: Aug 20. Previous crops: Potatoes 1962, winter wheat 1963.

Butt Close (W). Ploughed twice: Oct 2, 1963 and Jan 6, 1964. 'Nitro-Chalk' applied: Feb 27. Seed drilled: Feb 28. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 6. Combine harvested: Aug 27. Previous crops: Spring beans and carrots 1962, winter wheat 1963.

NOTE: In the experiment on Butt Close (W) varieties C, E and I (only) showed severe yellowing. Later all varieties grew badly from unknown causes and no yields were taken.

Standard errors per plot. Grain:

Great Knott III (R):	Whole plot:	0.90 or 2.2% (18 d.f.)
	Sub plot:	3.13 or 7.6% (42 d.f.)

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64/Db/1.2

SUMMARY OF RESULTS

Great Knott III (R)

GRAIN

	N1	N2	N3	Mean
		(1) and (2)		(±0.29)
A	28.3	32.3	39.5	33.4
B	44.1	48.2	44.6	45.6
C	39.8	42.6	46.4	42.9
E	37.7	37.6	39.1	38.1
I	42.4	49.2	49.2	46.9
P	34.8	42.8	44.1	40.6
PL	37.7	43.6	42.3	41.2
Mean (±0.59)	37.8	42.3	43.6	41.2

Mean D.M. %: 83.3

(1) ±1.57 For use in horizontal and interaction comparisons
(2) ±1.36 For use in vertical and diagonal comparisons

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64/Db/2.1

BARLEY

(RB 201 and WB 201)

Row spacing, seed rates and N - Rothamsted (R) Great Knott III and Woburn (W) Butt Close 1964.

Design (each field): 4 randomised blocks of 8 plots each, plots being split into 3 for application of N.

Area of each sub plot: 0.0056 acres.

Treatments: All combinations of:-
Whole plots. (1) Row spacing: Seed and PK* broadcast (B): seed drilled, 4 inches between rows, PK broadcast (C): seed drilled, 7 inch rows, PK broadcast (W): seed drilled, 7 inch rows, PK combine drilled (W*).
(2) Seed rates: 2 (L), 4 (H) bushel.
Sub plots. (3) Nitrogen: 0.4 (N1): 0.7 (N2): 1.0 (N3) cwt N as 'Nitro-Chalk', broadcast.

* (0:20:20) to all plots - rate 2 cwt.

Cultivations, etc.:
Great Knott III (R): Ploughed twice: Sept 26 - Nov 26, 1963 and Jan 6, 1964. Seed sown: Mar 12. 'Nitro-Chalk' and broadcast PK applied: Plots 201-208 - Mar 18, remaining plots - Mar 26. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 14. Combine harvested: Aug 21. Variety: Maris Badger. Previous crops: Potatoes 1962, winter wheat 1963.
Butt Close (W): Ploughed twice: Oct 2, 1963 and Jan 6, 1964. 'Nitro-Chalk' and broadcast PK applied: Feb 26. Seed sown: Mar 11. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 6. Combine harvested: Aug 25. Variety: Maris Badger. Previous crops: Spring beans and carrots 1962, winter wheat 1963.

NOTES (1). Great Knott III (R): There was a drill failure on all sub plots of plot RB 205 (Treatment W*L). Estimated values were used in the analysis.
(2). Butt Close (W): Two blocks (plots WB 209 - 216 and 225 - 232) were abandoned because of poor stands and much weed growth.

Standard errors per plot. Grain:

Great Knott III (R)	Whole plot:	2.20 or 4.4% (20 d.f.)
	Sub plot:	3.00 or 6.0% (46 d.f.)
Butt Close (W)	Whole plot:	2.23 or 7.5% (7 d.f.)
	Sub plot:	4.52 or 15.1% (16 d.f.)

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64/Db/2.2

SUMMARY OF RESULTS

GRAIN

ROTHAMSTED

	B	C	W	W*	Mean
		(±1.10)			(±0.55)
L	52.1	50.8	48.8	48.6	50.1
H	52.5	50.3	46.0	48.2	49.3
		(1) and (2)			(±0.53)
N1	48.4	45.7	42.8	44.3	45.3
N2	54.2	51.0	48.5	49.6	50.8
N3	54.3	54.9	51.0	51.3	52.9
Mean (±0.78)	52.3	50.5	47.4	48.4	49.7

	L	H
	(3) and (4)	
N1	45.3	45.2
N2	51.5	50.2
N3	53.3	52.4

Mean D.M. %: 85.9

(1) ±1.06 (3) ±0.75. For use in vertical and interaction comparisons.

(2) ±1.16 (4) ±0.82. For use in horizontal and diagonal comparisons.

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64/Db/2.3

GRAIN

WOBURN

	B	C	W	W*	Mean
		(±1.58)			(±0.79)
L	26.2	30.1	29.9	33.0	29.8
H	30.8	29.7	29.2	30.4	30.0
		(1) and (2)			(±1.13)
N1	20.0	22.7	19.3	21.9	21.0
N2	29.2	30.8	31.5	29.8	30.3
N3	36.3	36.2	37.9	43.5	38.5
Mean (±1.11)	28.5	29.9	29.6	31.7	29.9

	L	H
	(3) and (4)	
N1	20.8	21.2
N2	30.0	30.6
N3	38.6	38.3

Mean D.M. %: 85.4

(1) ±2.26 (3) ±1.60. For use in vertical and interaction comparisons.

(2) ±2.16 (4) ±1.53. For use in horizontal and diagonal comparisons.

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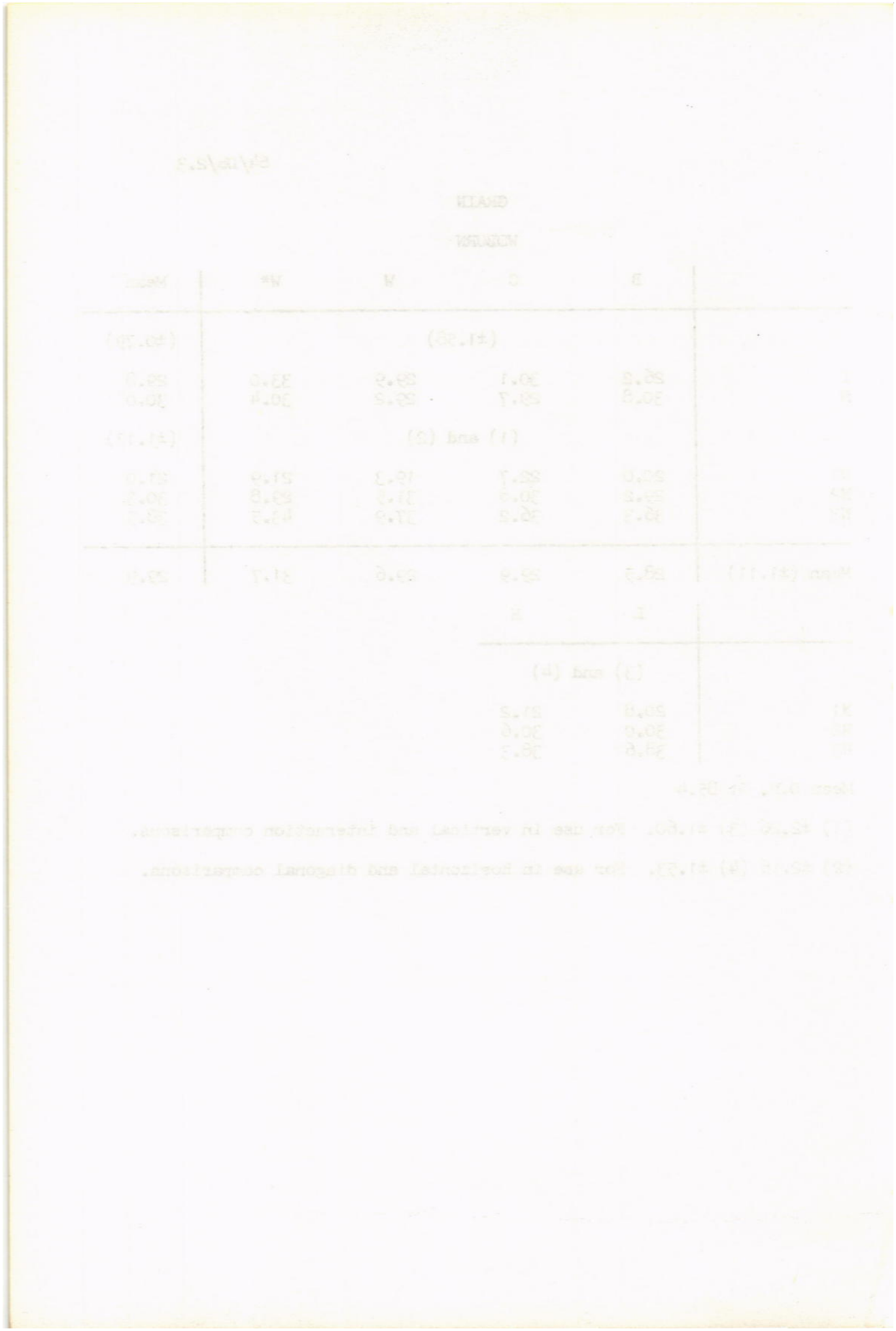

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64/Db/3

BARLEY

(RB 301)

The effect of insecticides on thrips, aphids and the spread of virus - Long Hoos V 1964.

Design: 6 randomised blocks of 4 plots each.

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

Treatments: Dimethoate spray: None (0), 4* early applications (E), 4* late applications (L), 8* applications (EL). Rate of application: 16 fluid oz of Rogor 40 in 40 gals.

*Intended number. Actually treatments E and L received 2 applications each and EL four.

Basal dressing: 3 cwt 20:10:10 combine drilled.

Cultivations, etc.: Ploughed: Oct 21, 1963. Seed drilled at 2 bushels: Feb 14, 1964. E and EL plots sprayed: May 6 and 28. EL and L plots sprayed: June 17, July 2. Combine harvested: Aug 11. Variety: Proctor. Previous crops: Potatoes 1962, winter and spring wheat 1963.

NOTE. Plant and shoot establishment counts were made on Apr 2 and 30. Water traps were used for 6 weeks early in the season and aphid and thrips counts made from May 5 at about weekly intervals until July 28.

Standard error per plot.
Grain: 2.81 or 9.0% (15 d.f.)

SUMMARY OF RESULTS

GRAIN

0	E	L	EL	Mean
30.3	30.9	31.1	31.9	31.1
	(±1.15)			

Mean D.M. %: 86.1

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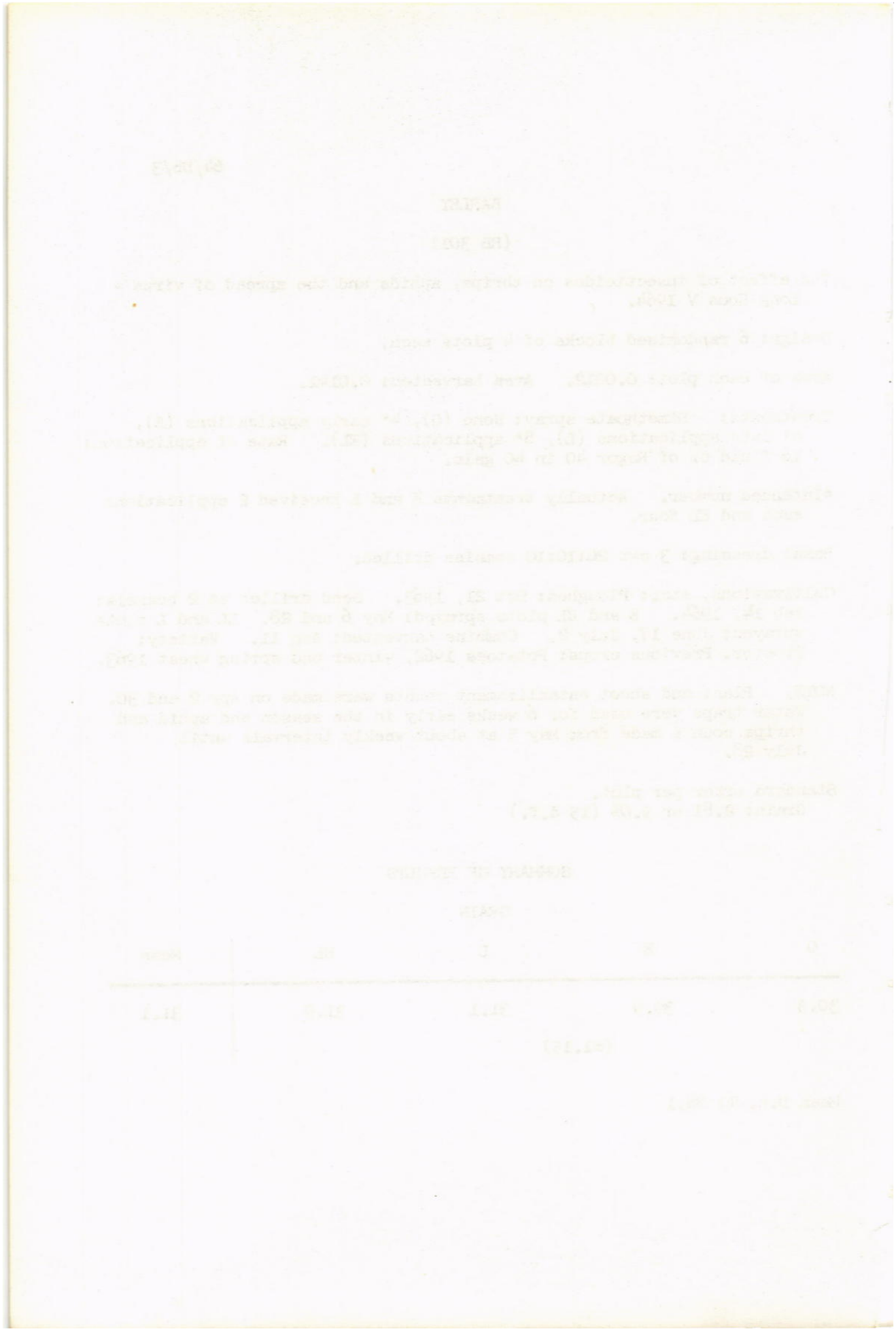

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64/Dc/1.1

SPRING BEANS

(RBe 101)

Row spacing, seed rates and rates and methods of fertiliser application - Delharding 1964.

Design: 2 replicates of 4 x 2 x 2 x 2 in blocks of 8 plots.

Area of each plot: 0.0193. Area harvested: 0.0133.

Treatments. All combinations of:-
1. Row spacing: 10.5 inches (C), 21 inches (W).
2. Seed rates: 200 lb (L), 300 lb (H).
3. Fertiliser rates: 400 lb (F1), 560 lb (F2) 0:20:20, 500 lb (N1), 700 lb (N2) 6:15:15.
4. Methods of fertiliser application: Broadcast (B), placed (P).

Basal dressing: None.

Cultivations, etc.: Ploughed: Oct 3, 1963. Seed drilled (treatments CB, CP and WB): Apr 3, 1964, treatments WP: Apr 6. Broadcast fertilisers applied: Apr 7. Sprayed with simazine at 1 lb in 40 gals: Apr 8. Combine harvested: Sept 3. Variety: Pedigree Tic. Previous crop: Barley 1962 and 1963.

Standard error per plot.
Grain: 1.45 or 4.4% (28 d.f.)

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64/Dc/1.2

SUMMARY OF RESULTS

GRAIN

		F1	F2	N1	N2	Mean
Mean	(±0.36)	32.7	33.4	33.0	34.1	33.3
						(±0.26)
C	(±0.51)	33.1	33.3	33.0	33.6	33.3
W		32.3	33.5	33.0	34.5	33.3
L	(±0.51)	32.4	32.6	32.7	33.4	32.8
H		33.0	34.3	33.2	34.8	33.8
B	(±0.51)	32.0	32.7	33.1	33.5	32.9
P		33.4	34.1	32.8	34.6	33.7

	C	W	L	H
		(±0.36)		
L	32.9	32.6		
H	33.6	34.0		
B	33.1	32.6	32.4	33.4
P	33.4	34.1	33.2	34.2

Mean D.M. %: 84.4

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64/Dd/1.1

POTATOES

(RP101 and WP201)

Varieties and chitting - Rothamsted (R) Whittlocks and Woburn (W) Horsepool 1964.

Design: 4 randomised blocks of 8 plots each.

Area of each plot: Whittlocks (R): 0.0107. Area harvested: 0.0043. Horsepool (W): 0.0114. Area harvested: 0.0057.

Treatments: All combinations of:-
1. Chitting: Not chitted (O), chitted seed (C).
2. Varieties: Majestic (M), King Edward (KE).
3. Type of seed: Stock seed (SS), once grown seed (OG).

Basal dressing: Whittlocks (R): 8 cwt 17:11:22 and 8.5 tons dung. Horsepool (W): 7 cwt 17:11:22.

Cultivations, etc.:
Whittlocks (R). Ploughed: Oct 11, 1963. Dung applied: Feb 6, 1964. Rotary cultivated: Feb 12. Basal dressing applied: Apr 2. Rotary cultivated, potatoes planted*: Apr 29. Earthed up: June 23. Sprayed 3 times with Mancozeb at 1.2 lb in 35 gals: June 30, July 16, July 31. Sprayed with undiluted BUV at 15 gals: Sept 7. Lifted: Sept 15. Previous crops: Winter and spring wheat 1962, spring wheat 1963.
Horsepool (W). Chisel ploughed: Dec 7, 1963. Ploughed: Jan 3, 1964. Rotary cultivated: Apr 28. Basal dressing applied: Apr 14. Potatoes planted: Apr 30. Earthed up: June 16. Sprayed 3 times with mancozeb at 1.2 lb, the first in 50 gals, the second and third in 36 gals: June 24, July 14, July 29. Sprayed with diquat (Reglone at 4 pints in 40 gals): Sept 8. Lifted: Sept 21. Previous crops: Grass 1962, winter wheat 1963.

*At the time of planting, seed for two rows of plots 116(M OG) and 124(C KE SS) was interchanged. The two remaining rows of each plot were correctly planted.

Standard errors per plot. Total tubers:
Whittlocks (R): 1.078 or 10.2% (21 d.f.)
Horsepool (W): 1.242 or 11.0% (21 d.f.)

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64/Dd/1.2

SUMMARY OF RESULTS

WHITTLOCKS (R)

TOTAL TUBERS

	M	KE	SS	OG	Mean
	(±0.381)		(±0.381)		(±0.270)
O	10.70	9.28	10.57	9.41	9.99
C	11.88	10.51	11.19	11.21	11.20
		M	11.36	11.22	11.29
		KE	10.40	9.40	9.90
	Mean	(±0.270)	10.88	10.31	10.59

PERCENTAGE WARE

	M	KE	SS	OG	Mean
O	90.0	84.1	87.9	86.3	87.1
C	94.3	89.0	90.0	93.3	91.7
		M	92.4	92.0	92.2
		KE	85.5	87.6	86.6
		Mean	88.9	89.8	89.4

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64/Dd/1.3

HORSEPOOL (W)

TOTAL TUBERS

	M	KE	SS	OG	Mean
	(±0.439)		(±0.439)		(±0.311)
O	12.13	9.50	11.12	10.51	10.82
C	13.17	10.50	11.52	12.15	11.84
		M	12.54	12.77	12.65
		KE	10.11	9.89	10.00
	Mean	(±0.311)	11.32	11.33	11.33

PERCENTAGE WARE

	M	KE	SS	OG	Mean
O	94.6	90.3	92.1	92.8	92.5
C	97.0	90.5	92.2	95.3	93.8
		M	95.5	96.1	95.8
		KE	88.8	92.0	90.4
		Mean	92.2	94.0	93.1

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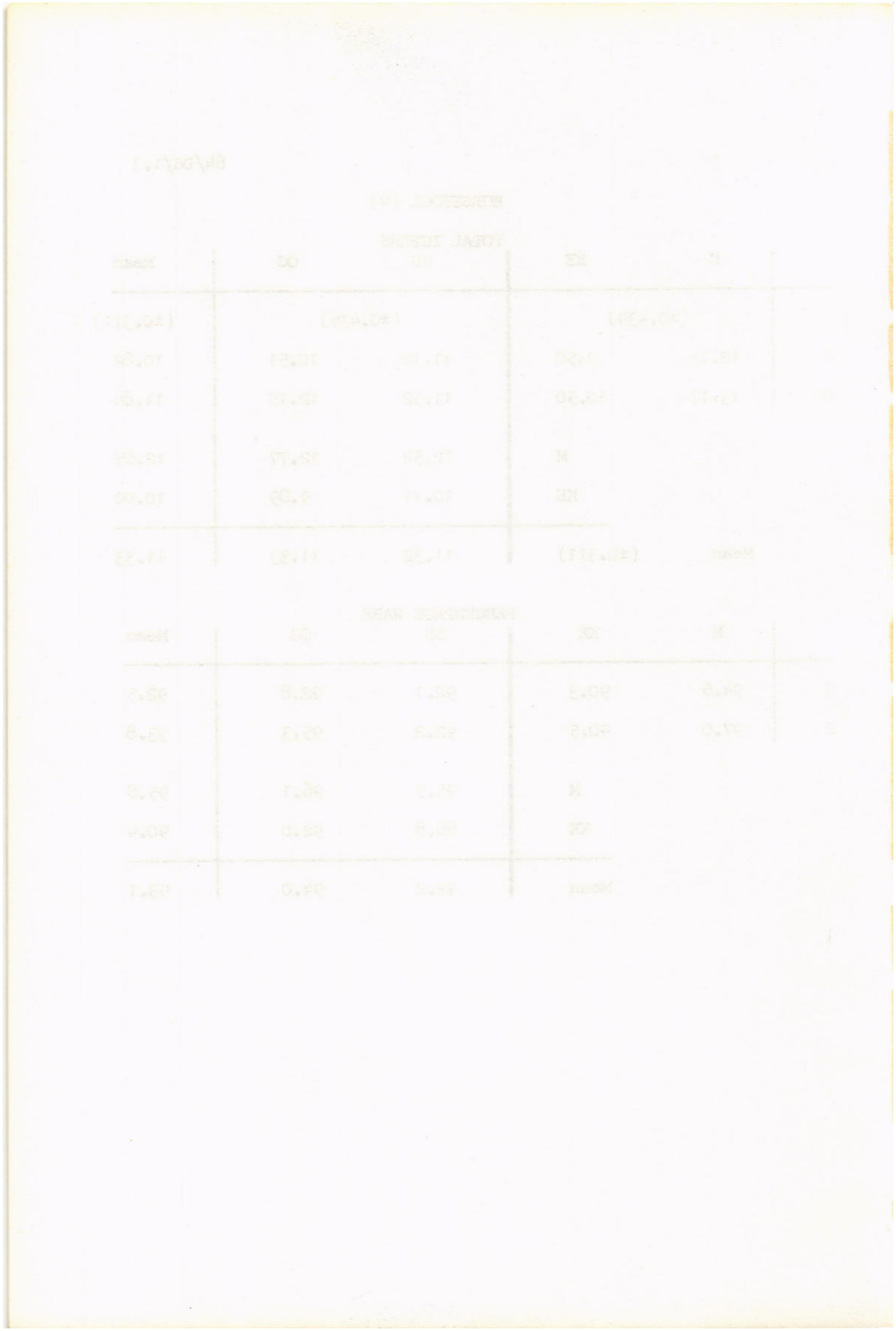

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64/Dd/2.1

POTATOES

(RP 201)

Time of burning off haulm - Whittlocks 1964.

Design: 4 randomised blocks of 14 plots each (11 for yield).

Area of each plot: 0.0424. Area harvested: 0.0141.

Treatments:

Fungicide sprays* and times of application	Times of burning off**
None (0)	None (0)
Early 5 (E+)	None (0)
Early 4 (E)	(A)
Early 5 (E+)	(A)
Late 4 (L)	(A)
Early 4 (E)	(B)
Early 5 (E+)	(B)
Early 5 (E+)	(C) (See below)
Late 4 (L)	(B)
Late 5 (L+)	(B)
Early 5 (E+). Sprayed with insecticide(I) (0.25 lb, menazon in 50 gals)	(B)

Each block also contained 3 plots for sampling (no yields), of these 12 plots 6 were treated as 00 - and 6 as E0. The early burning off (A) took place when the mean destruction by blight on control plots was 39% and on sprayed plots (E+) was 0.5%. The late burning off (B) took place when the haulm had almost died because of the dry weather.

NOTE: It was intended to have a later burning off (C) but the season made this unnecessary and so C = B.

* 1.5 lb fungicide containing 80% mancozeb in 50 gals.
** With undiluted BOV at 15 gals.

Basal dressing: 8.5 tons dung, 8 cwt 17:11:22.

Cultivations, etc.: Ploughed: Oct 11, 1963. Dung applied: Feb 6, 1964. Rotary cultivated: Feb 12. Basal dressing applied: Apr 2. Rotary cultivated, potatoes machine planted: Apr 27. Earthed up: June 12. Menazon sprays applied: June 25 and July 24. First spraying with mancozeb (E, E+): June 25, second (E, E+, L, L+): July 13, third (E, E+, L, L+): July 24, fourth (E, E+, L, L+): Aug 7, fifth (E+, L, L+): Aug 20, final (L+): Sept 3. A plots sprayed with BOV: Sept 7. B plots sprayed with BOV: Sept 21. Lifted: Sept 30.

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Variety: King Edward. Previous crops: Winter and spring wheat 1962, spring wheat 1963.

NOTE: Periodic samples were taken from the sample plots for weights of tubers and blight assessment in tubers.

Standard error per plot.
Total tubers: 0.870 or 6.7% (31 d.f.)

SUMMARY OF RESULTS

		Total tubers	% ware
		(±0.435)	
O	O	12.53	95.2
E+	O	13.86	96.2
E	A	12.31	94.3
E+	A	12.40	95.4
L	A	12.48	94.1
E	B	12.84	95.1
E+	B	13.14 (±0.308)	94.4
L	B	12.92	94.7
L+	B	12.64	93.9
E+I	B	13.53	95.1
Mean		12.89	94.8

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64/Dd/3.1

POTATOES

(RP 501)

Control of blight (Phytophthora infestans) by copper and tin fungicides - Long Hoos IV 1964.

Design: Two 6 x 6 Latin squares, one for each variety - King Edward and Ulster Supreme. Some plots were split for certain additional treatments.

Area of each plot: 0.0129. Area harvested: 0.0077.

Treatments:
- No fungicide (0)
- Commercial copper oxychloride wettable powder at 2.5 lb Cu (1)
- Copper oxychloride at 2.5 lb Cu with 10 lb wax (2)
- As treatment 2 with phenylmercury acetate at 0.03 lb (3)
- Commercial triphenyltin acetate wettable powder at 0.3 lb triphenyltin acetate (4)
- Triphenyltin acetate at 0.3 lb in 10 lb wax (5)

All sprays applied in 100 gals.

NOTE: Additional treatments with copper oxychloride and triphenyltin acetate were applied to certain sub plots, but as there was no blight separate yields were not recorded.

Basal dressing: 7 cwt 17:11:22.

Cultivations, etc.: Ploughed: Sept 12 - 23, 1963. Sprayed three times with sodium trichloroacetate at 18 lb in 40 gals: Sept 25, Oct 1 and Oct 23. Chisel ploughed: Dec 18. Basal dressing applied: Apr 3, 1964. Rotary cultivated: Apr 14. Potatoes machine planted: Apr 15. Earthed up: June 12. Copper and tin fungicides applied: July 28. Lifted: King Edward - Sept 11, Ulster Supreme - Sept 18. Previous crops: Winter wheat 1962 and 1963.

Standard errors per plot. Total tubers:
- King Edward: 0.737 or 10.0% (20 d.f.)
- Ulster Supreme: 0.937 or 10.2% (20 d.f.)

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64/Dd/3.2

SUMMARY OF RESULTS

0	1	2	3	4	5	Mean
			KING EDWARD			
			TOTAL TUBERS			
7.59	7.35	7.34	6.93	7.25	7.94	7.40
			(±0.301)			
			% WARE			
79.9	80.3	79.1	80.3	80.5	81.2	80.2
			ULSTER SUPREME			
			TOTAL TUBERS			
9.70	9.13	9.07	9.11	8.42	9.53	9.16
			(±0.383)			
			% WARE			
90.2	90.7	90.8	89.7	89.9	89.9	90.2

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64/Dd/4.1

POTATOES

(WP 101)

Control of tuber blight (Phytophthora infestans) by fungicide sprays and haulm destruction - Woburn Horsepool 1964.

Design: 6 x 6 Latin square.

Area of each plot: 0.0360. Area harvested: 0.0141.

Treatments: No fungicide, not burnt off (0)
Fungicide sprays*: 3 times early (E)
4 times early (E+)
3 times late (L).
Haulm burnt off with diquat** on sprayed plots. In addition two plots per row (one control and one E+ plot on which the haulm was not burnt off) were used for sampling only.

* 1.5 lb fungicide, containing 80% mancozeb, in 50 gals.
** Reglone at 4 pints in 40 gals.

Basal dressing: 7 cwt 17:11:22.

Cultivations, etc.: Chisel ploughed: Dec 7, 1963. Ploughed: Jan 3 - 10, 1964. Basal dressing applied: Apr 14. Rotary cultivated twice: Apr 23 and 27. Potatoes machine planted: Apr 27. Earthed up: June 12. First spraying with mancozeb (E and E+ plots): June 24, second (E, E+ and L): July 14, third (E, E+ and L): July 28, final (E+ and L): Aug 10. Appropriate plots sprayed with diquat: Sept 21. Lifted: Sept 30. Variety: King Edward. Previous crops: Grass 1962, winter wheat 1963.

NOTE: Periodic samples were taken from the sample plots for weight of tubers and blight assessment in tubers.

Standard error per plot.
Total tubers: 0.681 or 6.5% (15 d.f.)

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64/Dá/4.2

SUMMARY OF RESULTS

O	E	E+	L	Mean
		TOTAL TUBERS		
		(±0.278)		
10.30	10.21	10.52	10.66	10.42
		% WARE		
94.1	94.5	93.4	93.6	93.9

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64/De/1

CARROTS

(WCt 101)

The effect of systemic insecticides on yield through control of motley dwarf virus - Woburn Butt Close 1964.

Design: 6 randomised blocks of 2 plots each.

Area of each plot: 0.0077. Area harvested: 0.0029.

Treatments: None (O), sprayed 5 times with menazon at 0.5 lb in 60 gals (S).

Basal dressing: 8 cwt (10:10:18).

Cultivations, etc.: Ploughed twice: Oct 2, 1963 and Jan 6, 1964. Basal dressing applied: Apr 30. Seed drilled at 4 lb: May 4. Menazon sprays applied: May 27, June 12, June 24, July 14, July 29. Lifted: Sept 7. Variety: New Model Red Cored. Previous crops: Spring beans 1962, winter wheat 1963.

NOTE: Aphid counts and estimates of virus infection were made.

Standard errors per plot.
Marketable roots: 0.822 or 5.0% (5 d.f.)
Tops from marketable roots: 0.142 or 4.0% (5 d.f.)

SUMMARY OF RESULTS

O	S	Mean
	MARKETABLE ROOTS	
13.80	18.79	16.30
	(±0.336)	
	TOPS FROM MARKETABLE ROOTS	
2.94	4.11	3.52
	(±0.058)	

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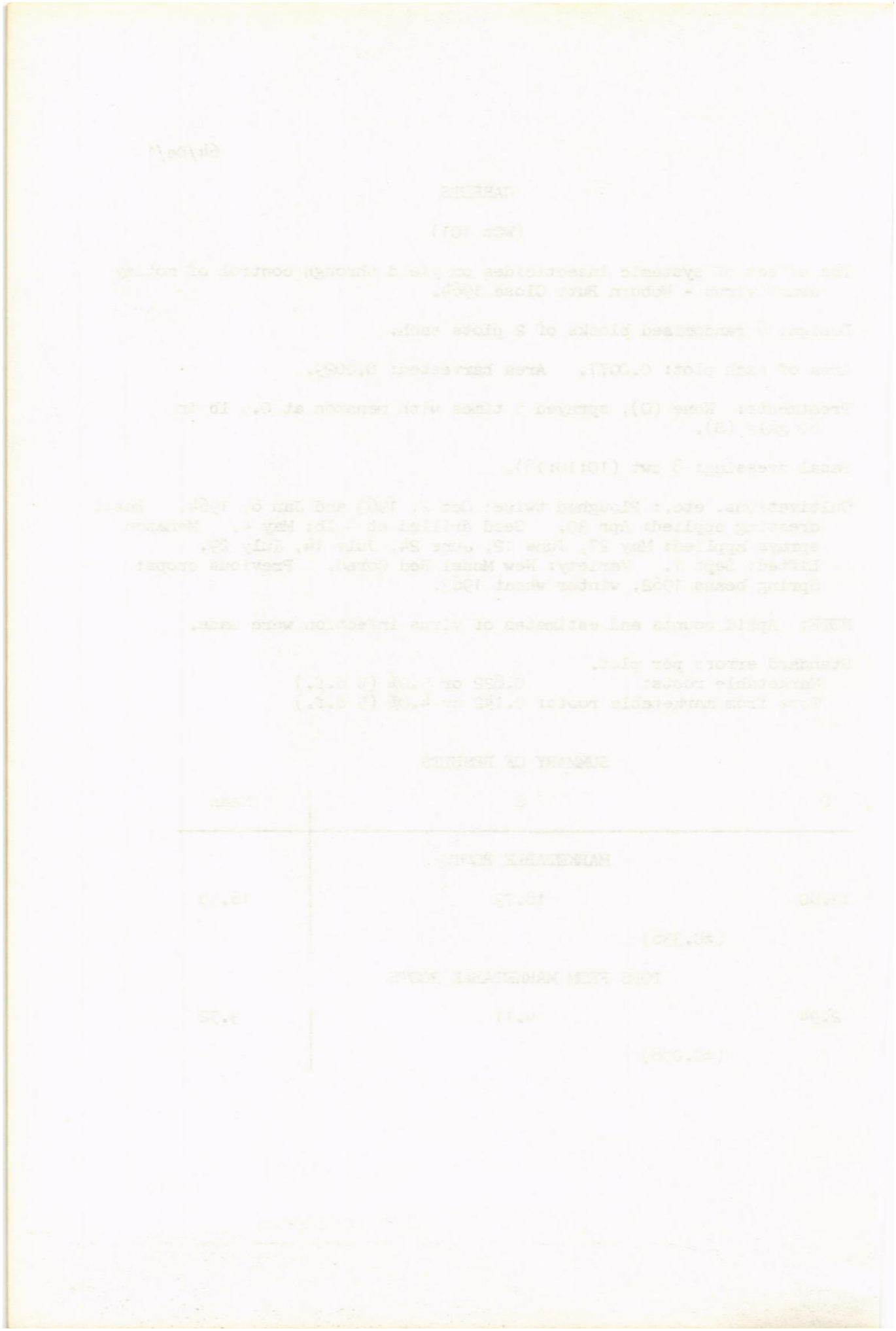

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64/Df/1.1

SUGAR BEET, CARROTS AND RED BEET

Fertilisers and FYM - Woburn Stackyard Series C, 1964.

Design: 3 randomised blocks of 5 plots each per crop.

Area of each plot:	Area harvested:
Sugar beet: 0.0033	0.0030
Other crops: 0.0014	0.0012

Treatments:

- NKNa: 'Nitro-Chalk' at 154 lb N (sugar beet), 112 lb N (carrots), 224 lb N (red beet), muriate of potash at 280 lb K and sodium chloride at 26 lb Na.
- NKNaP1: As NKNa, plus triple superphosphate at 85 lb P.
- NKNaP2: As NKNa, plus triple superphosphate at 170 lb P.
- D: Dung at 15 tons.
- DP1: Dung at 15 tons plus triple superphosphate at 85 lb P.

NOTES (1): The amounts of P in treatment P2 and of K and Na applied are equivalent to the amounts of these nutrients in the 15 tons FYM.

(2): On one of the NKNaP2 plots of sugar beet the N was not applied. An estimated value was used in the analysis.

Basal dressing: 50 lb Mg as magnesium sulphate.

Cultivations, etc.: Ground chalk applied at 30 cwt: Mar 3, 1964. Rotary cultivated: Mar 10. Ground chalk applied at 10 cwt: Apr 10. Sprayed with DDT at 0.6 lb in 20 gals: May 19. Sprayed twice with a mixture of menazon, DDT and gamma BHC at 1.5 fluid oz in 40 gals all crops: June 8 and 28. Carrots and sugar beet only: July 28 and Aug 7.

Sugar beet: Fertilisers applied: Mar 23, 1964. Dug: Mar 23 - Apr 2. Seed drilled at 18 lb: Apr 14. Singled: May 21 - June 3. Lifted: Oct 26. Variety: Klein E.

Carrots: Fertilisers applied, plots dug: Apr 3, 1964. Seed drilled at 7 lb: Apr 27. Singled: June 17 - 23. Lifted: Sept 8. Variety: Autumn King.

Red beet: Fertilisers applied, plots dug: Apr 7, 1964. Seed drilled at 30 lb: May 1. Singled: May 29 - June 16. Lifted: Aug 12. Variety: Detroit Globe.

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Standard errors per plot.

Sugar beet,	roots:	0.748 or 3.6%	(7 d.f.)
	total sugar:	1.81 or 2.2%	(7 d.f.)
	tops:	0.739 or 7.0%	(7 d.f.)
Carrots,	roots:	1.142 or 6.6%	(8 d.f.)
	tops:	0.385 or 7.3%	(8 d.f.)
	roots + tops:	1.498 or 6.6%	(8 d.f.)
Red beet,	roots:	0.536 or 3.8%	(8 d.f.)
	tops:	0.283 or 4.7%	(8 d.f.)
	roots + tops:	0.788 or 3.9%	(8 d.f.)

SUMMARY OF RESULTS

NKNa	NKNaP1	NKNaP2	D	DP1	Mean
		SUGAR BEET			
		ROOTS			
		(±0.432)			
19.24	20.93	22.01	20.63	21.19	20.80
		SUGAR %			
19.4	19.4	19.6	19.6	19.4	19.5
		TOTAL SUGAR			
		(±1.05)			
74.7	81.4	86.3	80.8	82.2	81.1
		TOPS			
		(±0.427)			
11.01	12.15	11.71	9.08	8.67	10.52

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NKNa	NKNaP1	NKNaP2	D	DP1	Mean
		CARROTS			
		ROOTS			
		(±0.660)			
14.82	16.39	18.67	17.25	19.23	17.27
		TOPS			
		(±0.222)			
4.91	5.21	5.56	5.37	5.34	5.28
		ROOTS + TOPS			
		(±0.865)			
19.72	21.60	24.23	22.62	24.57	22.55
		RED BEET			
		ROOTS			
		(±0.309)			
15.19	15.52	15.74	11.80	12.31	14.11
		TOPS			
		(±0.163)			
6.62	6.76	6.52	5.03	4.98	5.98
		ROOTS + TOPS			
		(±0.455)			
21.81	22.28	22.25	16.83	17.29	20.09

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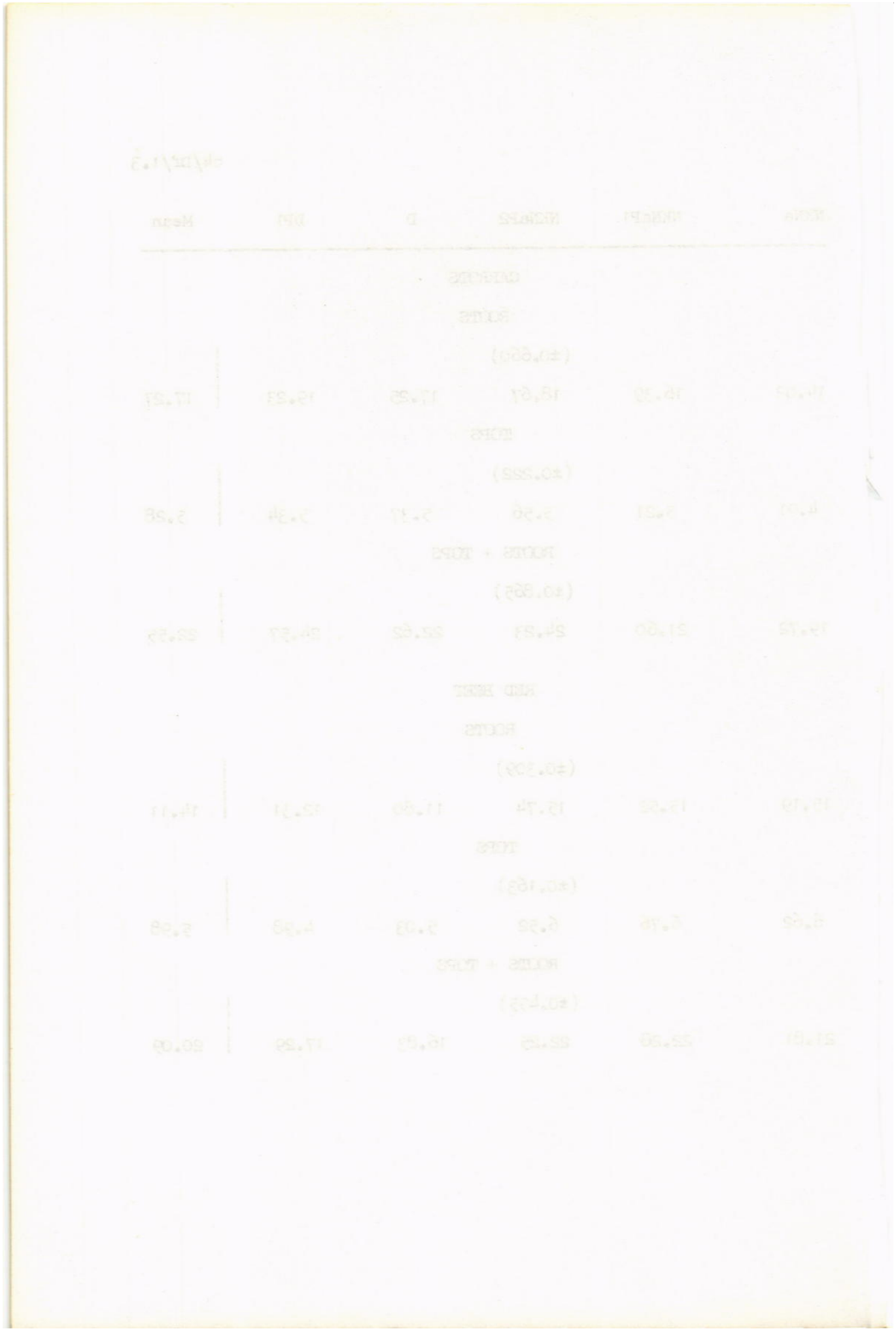

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64/Dg/1.1

GRASS

Effect of N-serve on old grass - Highfield odds and ends VII, 1964.

Design: 4 randomised blocks of 12 plots each.

Area of each plot: 0.0008. Area harvested: 0.0005.

Treatments: None, (2 plots per block) - (0), and all combinations of:-
1. Levels of N: 100 lb (L1), 200 lb (L2).
2. Kinds of fertiliser: Ammonium nitrate (AN), urea nitrate (UN), ammonium sulphate (AS) with N-serve at none (NS0), 1 (NS1) or 2 (NS2) per cent of the N applied.

Basal dressing: 0:14:28 to supply 25 lb P_2O_5 and 50 lb K_2O.

Cultivations, etc.: Fertilisers and N-serve applied: Mar 19, 1964.
Cut twice: May 20 and July 7.

NOTE: Samples were taken for dry matter and nitrogen determination.

Standard errors per plot. Dry matter:
1st cut: 3.06 or 9.4% (33 d.f.)
2nd cut: 3.35 or 16.0% (33 d.f.)
Total of 2 cuts: 4.77 or 8.9% (33 d.f.)

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SUMMARY OF RESULTS

	0	AN	UN	ASNSO	ASNS1	ASNS2	Mean
			1ST CUT				
			(±1.53)				(±0.68)
L1		34.6	31.1	36.6	36.1	33.8	34.4
L2		42.1	29.9	41.4	39.4	42.1	39.0
Mean (±1.08)	12.5	38.4	30.5	39.0	37.8	38.0	32.7*

Mean D.M. %: 16.1

			2ND CUT				
			(±1.67)				(±0.75)
L1		18.4	19.4	18.1	16.9	16.7	17.9
L2		21.9	23.3	25.0	23.6	24.5	23.7
Mean (±1.18)	21.7	20.1	21.3	21.5	20.2	20.6	20.9*

Mean D.M. %: 24.5

			TOTAL OF 2 CUTS				
			(±2.39)				(±1.07)
L1		53.0	50.5	54.7	53.0	50.5	52.3
L2		64.0	53.1	66.3	63.0	66.7	62.6
Mean (±1.69)	34.3	58.5	51.8	60.5	58.0	58.6	53.6*

Mean D.M. %: 20.3

* General mean

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64/Dg/2.1

GRASS

Levels of N and K - Harwoods Piece 1964.

Design: 4 randomised blocks of 12 plots each.

Area of each plot: 0.0014. Area harvested: 1st and 2nd cuts - 0.0006, 3rd cut - 0.0008.

Treatments: All combinations of:-
1. N: None (N0), 0.3 (N1), 0.6 (N2), 0.9 (N3) cwt N per cut as 'Nitro-Chalk'.
2. K: None (K0), 0.6 (K1), 1.2 (K2) cwt K20 per cut as muriate of potash.

Both applied in spring and after each cut except the last.

Basal dressing: 0.6 cwt P205 in seedbed as triple superphosphate.

Cultivations, etc.: Ploughed: Nov 18, 1963. Rotary cultivated, fertilisers applied, seed drilled at 30 lb: Apr 2, 1964. Cut 3 times: July 1, Aug 12, Oct 28. Fertilisers applied after first 2 cuts. Variety: S22 Italian Ryegrass. Previous crops: Barley 1962 and 1963.

NOTE: Samples were taken for estimation of soluble carbohydrate and dry matter in grass.

Standard errors per plot. Dry matter:

1st cut:	3.15	or 13.8% (33 d.f.)
2nd cut:	1.48	or 7.2% (33 d.f.)
3rd cut:	1.24	or 13.5% (33 d.f.)
Total of 3 cuts:	4.32	or 8.2% (33 d.f.)

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64/Dg/2.2

SUMMARY OF RESULTS

DRY MATTER

	N0	N1	N2	N3	Mean
		1ST CUT			
		(±1.58)			(±0.79)
K0	11.3	18.2	25.2	28.4	20.8
K1	13.7	23.1	28.7	32.9	24.6
K2	13.3	19.6	27.5	31.4	22.9
Mean (±0.90)	12.8	20.3	27.1	30.9	22.7
		2ND CUT			
		(±0.74)			(±0.36)
K0	6.9	18.8	26.5	30.1	20.5
K1	7.9	18.8	26.1	28.8	20.4
K2	7.6	19.1	26.2	29.5	20.6
Mean (±0.43)	7.5	18.9	26.3	29.4	20.5

Mean D.M. %: 1st cut 20.3
2nd cut 19.1

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DRY MATTER

	N0	N1	N2	N3	Mean
		3RD CUT			
		(±0.62)			(±0.31)
K0	1.6	7.5	11.6	12.4	8.3
K1	1.9	8.1	12.9	14.7	9.4
K2	1.9	8.8	13.1	15.1	9.7
Mean (±0.36)	1.8	8.1	12.5	14.1	9.1
		TOTAL OF 3 CUTS			
		(±2.16)			(±1.08)
K0	19.8	44.4	63.3	70.8	49.6
K1	23.4	49.9	67.8	76.4	54.4
K2	22.9	47.5	66.7	76.0	53.3
Mean (±1.25)	22.0	47.2	65.9	74.4	52.4

Mean D.M. %: 3rd cut 26.0
Total of 3 cuts 21.8

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