

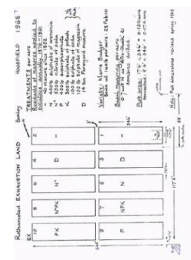
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ROTHAMSTED
RESEARCH

Collection of Plans for the Exhaustion Land Experiment

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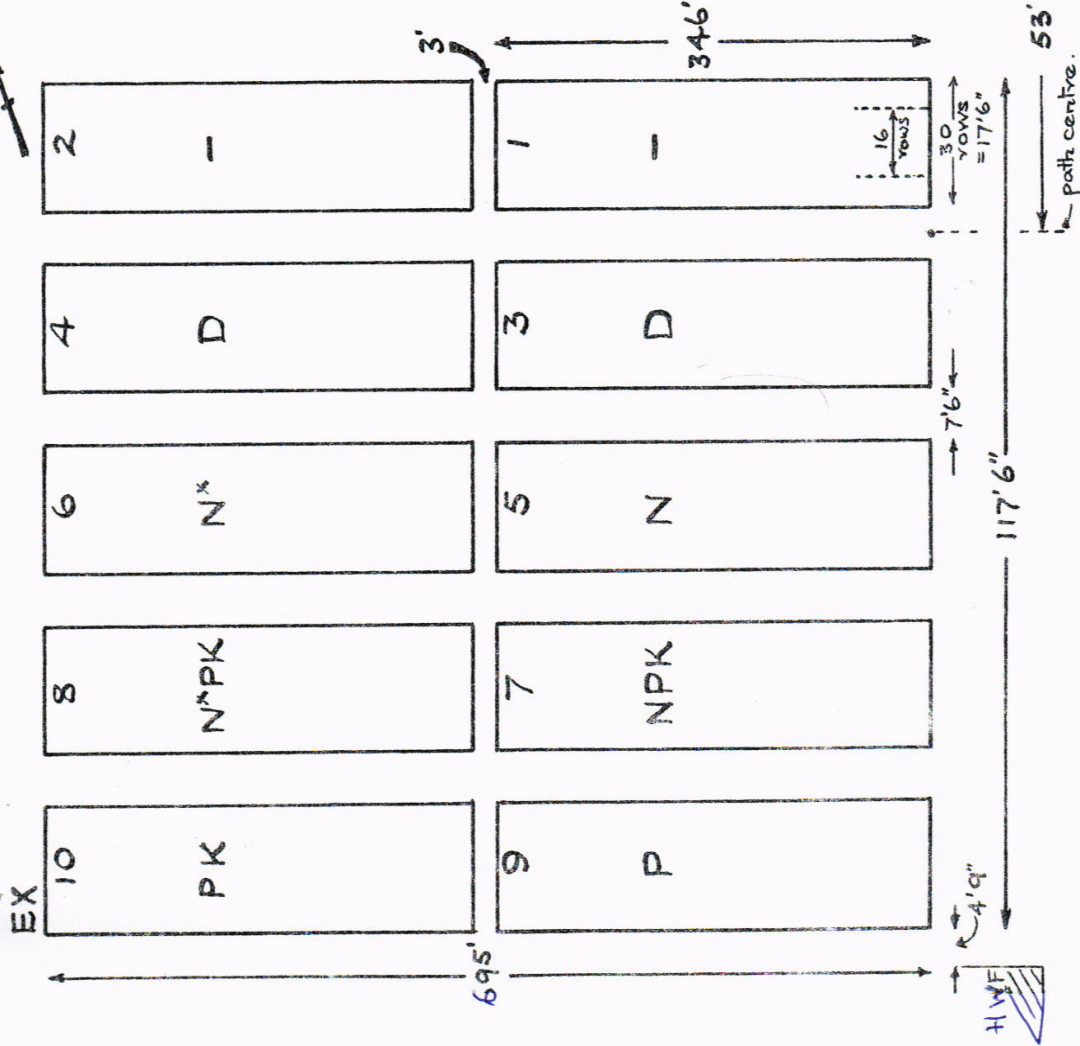


Default Title

Rothamsted Research

Rothamsted Research (1973-1986) *Default Title* ; Collection Of Plans For The Exhaustion Land Experiment, pp 1 - 17

Rothamsted EXHAUSTION LAND Barley. HOOSFIELD 1968 ↑



TREATMENTS per acre
Residuals of manures applied to potatoes annually 1876-1901

- No manure since 1852
- N 400 lb sulphate of ammonia
- N* 550 lb nitrate of soda
- P 400 lb superphosphate
- K 300 lb sulphate of potash
- 100 lb sulphate of soda
- 100 lb sulphate of magnesia
- D 14 ton Farmyard manure.

} ^K with ^{N, P, Mg}

Variety: Maris Badger
 Sown at 140 lb per acre: 28 Feb 191

Basal manuring per acre
 0.7 cwt N as Nitro-Chalk 21
 combine drilled.

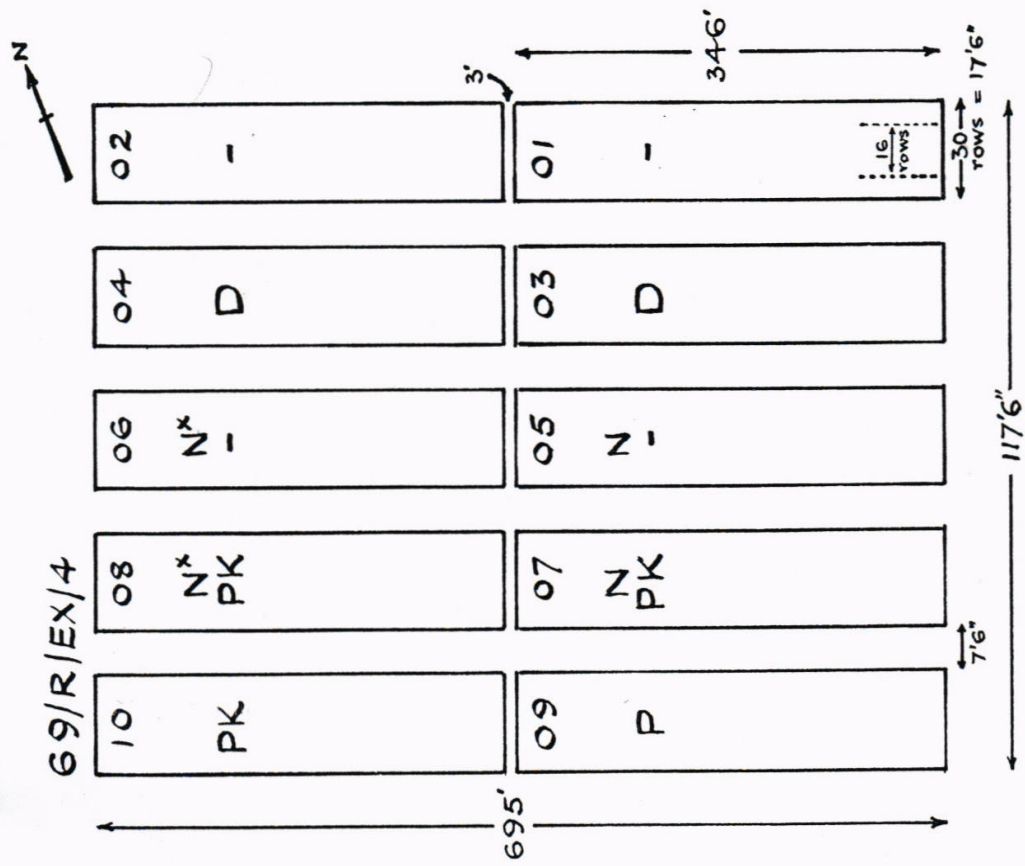
Plot area: 17'6" x 346' = 0.139 acre
Harvested: 9'4" x 346' = 0.074 acre

White concrete post

Note: Plot dimensions revised spring 1968

4
681

Rothamsted EXHAUSTION LAND Barley HOOSFIELD 114th year 1969



TREATMENTS per acre
Residuals of Manures applied to POTATOES
annually 1876 - 1901

- No manure since 1852
- N 400lb sulphate of ammonia
- N^x 550lb nitrate of soda
- P 400lb superphosphate
- K 300lb sulphate of potash } ^K with Na, Mg
- 100lb sulphate of soda
- 100lb sulphate of magnesia
- D 14 tons Farmyard manure.

Variety: Maris Badger
sown at 140lb per acre on 10th March.

Basal manuring, per acre
0.7cwt N as 'Nitro-Chalk' 21 combine drilled

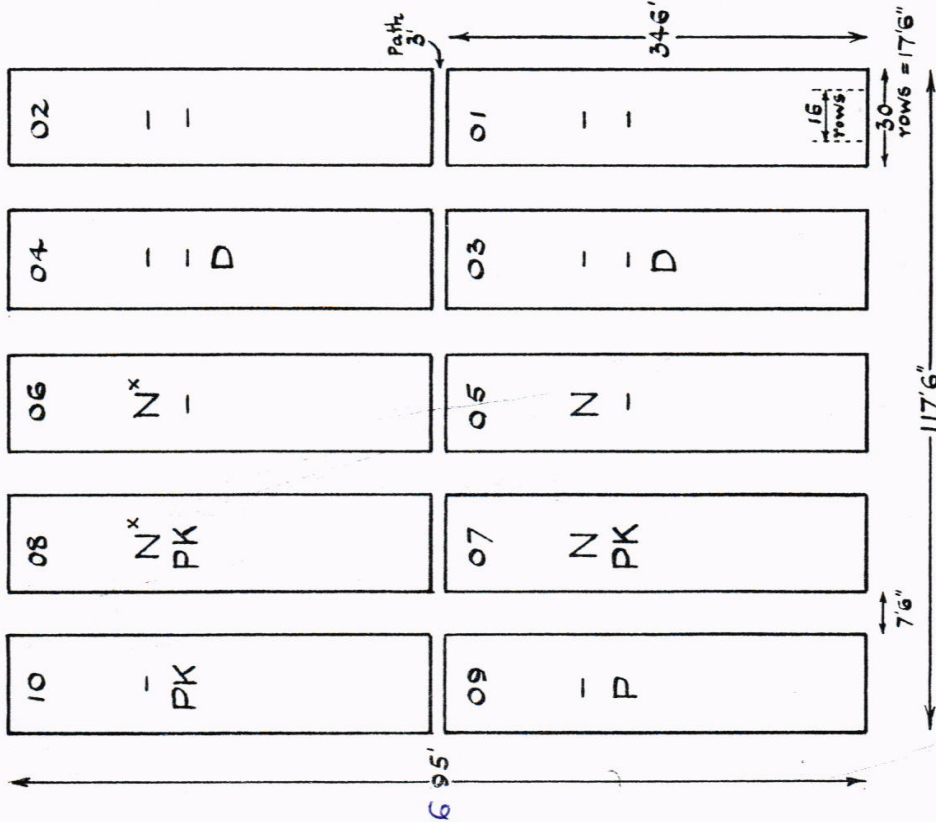
Plot area: 17'6" x 346' = 0.139 acre
Harvested: 9'4" x 346' = 0.074 acre

HOOSFIELD 116th year 1971 4

Barley

Rothamsted EXHAUSTION LAND

71/R/EX/4



TREATMENTS per acre (hectare)
Residuals of Manures applied to POTATOES
 annually 1876 - 1901

- N No manure since 1852
- N^x 400 lb (448 Kg) sulphate of ammonia
- P 550 lb (617 Kg) nitrate of soda
- K 400 lb (448 Kg) superphosphate
- 300 lb (336 Kg) sulphate of potash } 'K' with Na, Mg
- 100 lb (112 Kg) sulphate of soda
- 100 lb (112 Kg) sulphate of magnesias
- D 14 tons (35 tonnes) farmyard manure

Basal manuring, per acre (hectare)

0.7 cwt (87.5 Kg) N as 'Nitro-chalk' 2:1 combine drilled

Variety: Julia

Sown at 140 lb per acre (157 Kg/ha) on 25 Feb 1971

Plot area: 17'6" x 346' = 0.139 acre (0.056 ha)

Harvested: 9'4" x 346' = 0.074 acre (0.03 ha)

Note:

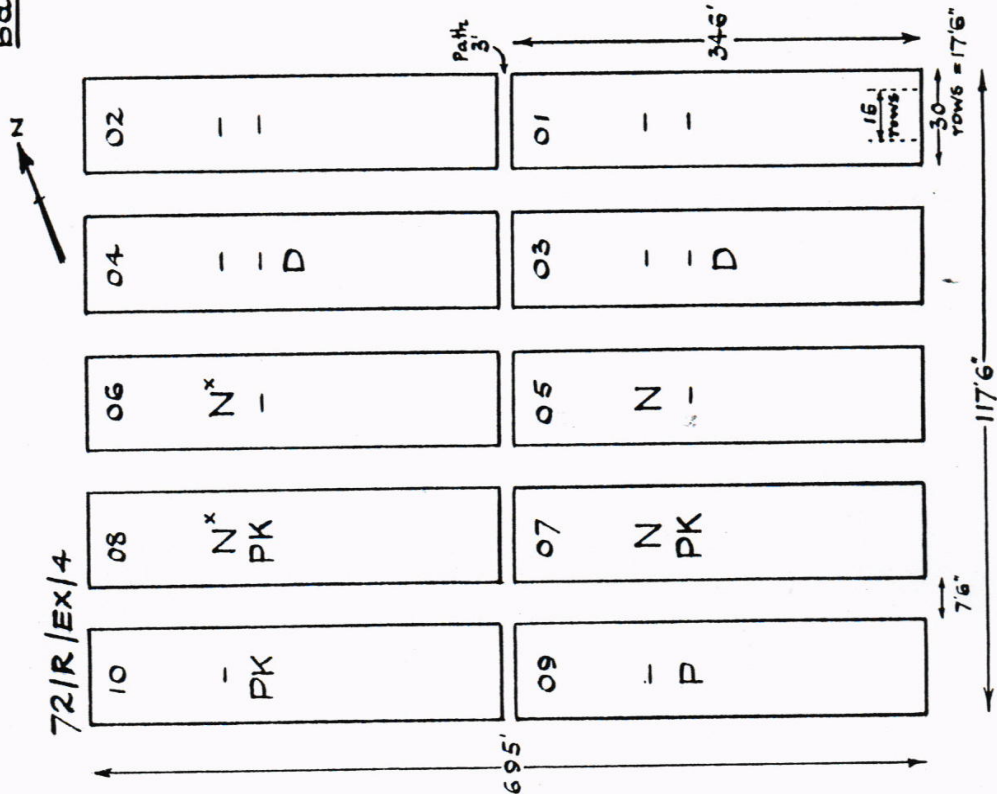
Julia barley drilled on North sideland

HOOSFIELD 117th year 1972 4

Rothamsted EXHAUSTION LAND

Barley

72/R/EX/4



TREATMENTS per acre (hectare)
Residuals of Manures applied to POTATOES
 annually 1876 - 1901

- No manure since 1852
- N^x 400 lb (448 kg) sulphate of ammonia
- N^x 550 lb (617 kg) nitrate of soda
- P 400 lb (448 kg) superphosphate
- K 300 lb (336 kg) sulphate of potash
- 100 lb (112 kg) sulphate of soda } 'K' with Na, Mg
- 100 lb (112 kg) sulphate of magnesias }
- D 14 tons (35 tonnes) farmyard manure

Basal manuring, per acre (hectare)

0.7 cwt (87.5 kg) N as 'Nitro-chalk' 21 combine drille.

Variety: Julia (seed dressed with ethirimol)

Sown at 140 lb per acre (157 kg/ha) on 16th March

Plot area: 17'6" x 346' = 0.139 acre (0.056 ha)

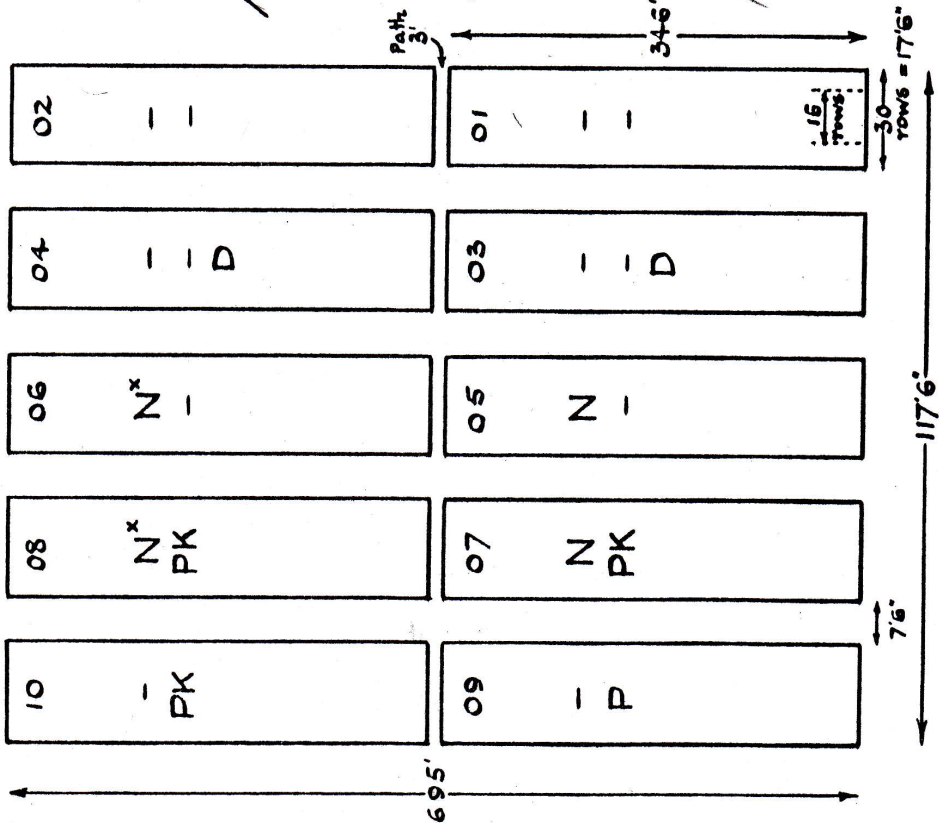
Harvested: 9'4" x 346' = 0.074 acre (0.03 ha)

Note: 10 Sep. 1971: Sprayed with Weedazol (aminotriazole/amm. thiocyanate) Julia barley drilled on North sideland

Rothamsted EXHAUSTION LAND 118th year 1973 4

Barley

73/R/EX/4



TREATMENTS per acre (hectare)
Residuals of Manures applied to POTATOES
 annually 1876 - 1901

- N^x No manure since 1852
 - N^x 400 lb (448 kg) sulphate of ammonia
 - P 550 lb (617 kg) nitrate of soda
 - K 400 lb (448 kg) superphosphate
 - K 300 lb (336 kg) sulphate of potash
 - 100 lb (112 kg) sulphate of soda
 - 100 lb (112 kg) sulphate of magnesia
 - D 14 tons (35 tonnes) farmyard manure
- } 'K' with Na, Mg

Basal manuring. per acre (hectare)

0.7 cwt (87.5 kg) N as 'Nitro-chalk' 2.5 combine drilled

Variety: Julia (seed dressed with ethirimol)

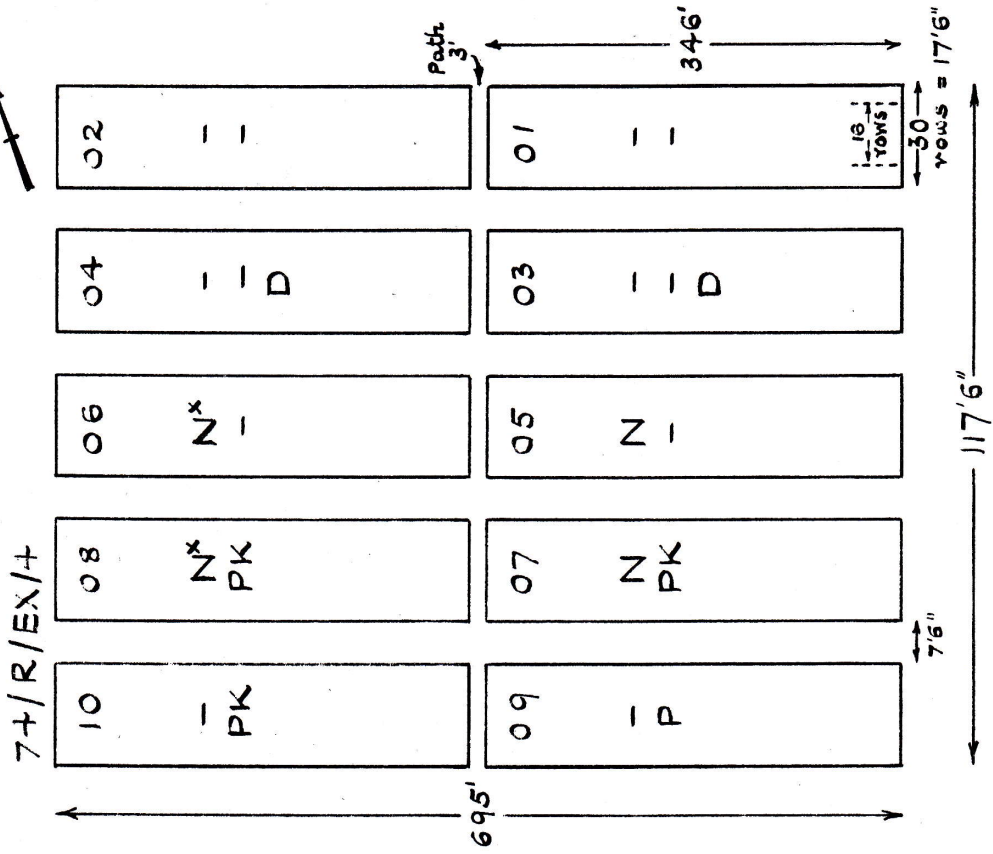
Sown at 140 lb per acre (157 kg/ha) on 9 March

Plot area: 17'6" x 346" = 0.139 acre (0.056 ha)

Harvested: 9'4" x 346" = 0.074 acre (0.03 ha)

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Rothamsted EXHAUSTION LAND 119th year BARLEY HOOSFIELD 1974



TREATMENTS per acre (hectare)
Residuals of Manures applied to POTATOES
 annually 1876-1901

- No manure since 1852
 - N^x 400 lb (448 Kg) sulphate of ammonia
 - N 550 lb (617 Kg) nitrate of soda
 - P 400 lb (448 Kg) superphosphate
 - K 300 lb (336 Kg) sulphate of potash
 - 100 lb (112 Kg) sulphate of soda
 - 100 lb (112 Kg) sulphate of magnesium
 - D 14 tons (35 tonnes) farmyard manure
- } "K" with Na, Mg

Basal manuring per acre (hectare)

0.7 cwt (87.5 Kg) N as 'Nitro-Chalk' 25 combine drilled

Variety: Julia (seed dressed with ethirimol)
 Sown at 14.0 lb per acre (157 Kg/ha) or

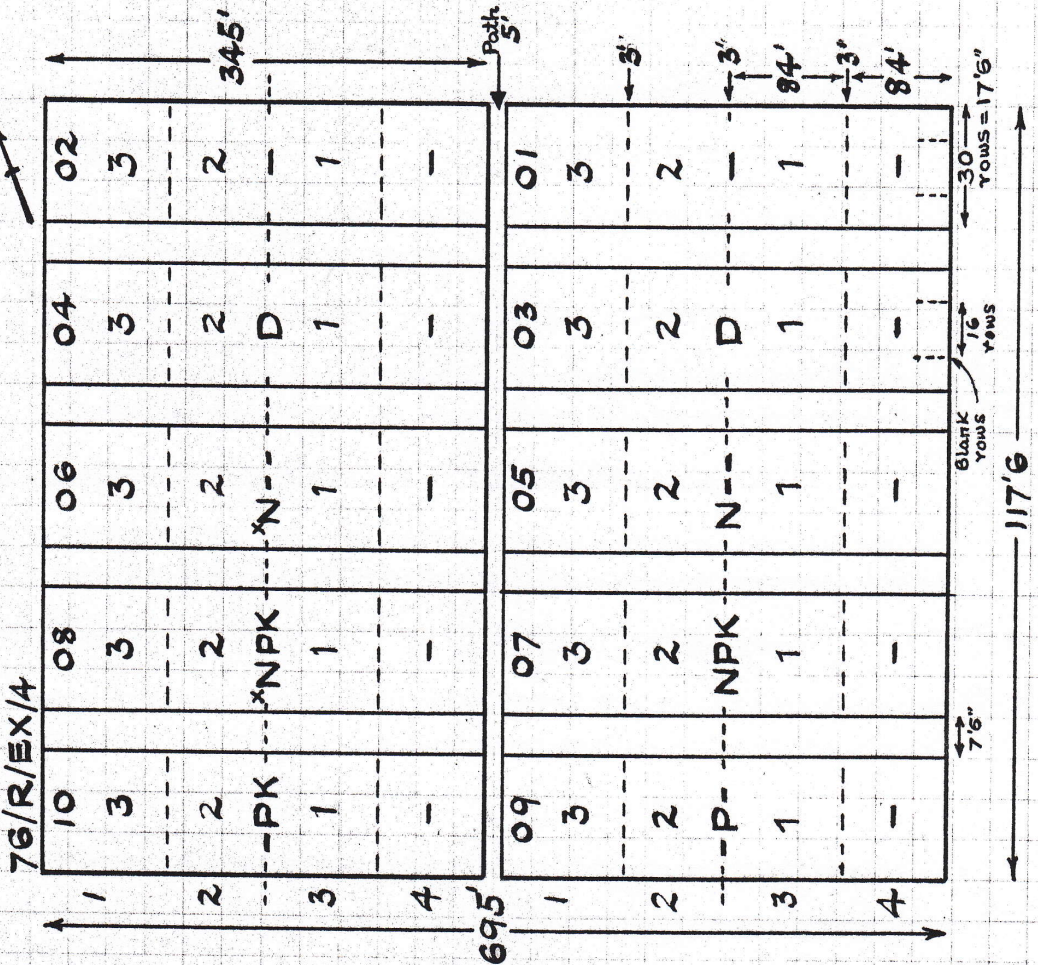
Plot area: 17'6" x 346' = 0.139 acre (0.056 ha)
Harvested: 9'4" x 346' = 0.074 acre (0.03 ha)

Rothamsted EXHAUSTION LAND 1976

21st Year BARLEY

HOOSFIELD

4



TREATMENTS per hectare (acre)
N to sub-plots - 1st Year, bare followed in 1975 (N rates to rotate every year)
 - 1, 2, 3 None, 48, 96, 144 Kg N as Nitro-Chalk 25 (- 43, 86, 129 lb N)

Basal manuring: None

Variety: Julia, seed dressed with ethirimol sown at 140lb/acre (157 kg/ha) on 3 Mar.

Residuals of Manures applied to POTATOES

Annually 1876 - 1901

- N No manure since 1852
 x N 400lb (448 kg/ha) sulphate of ammonia
 P 550lb (617 kg) nitrate of soda
 K 400lb (448 kg) superphosphate
 300lb (336 kg) sulphate of potash } K with Na, Mg
 100lb (112 kg) sulphate of soda.
 100lb (112 kg) sulphate of magnesium }
 D 14 tons (35 tonnes) farmyard manure

Plot area: 17'6" x 345' = 0.139 acre (0.056 ha)
Sub-plot 17'6" x 84' = 0.034 acre (0.014 ha)
Harvested: 9'4" x 84' = 0.018 acre (0.0073 ha)

N sequence

1976	77	78	79	80	81
0	3	2	1	0	3
3	1	3	0	2	1
	2	1	0	3	2

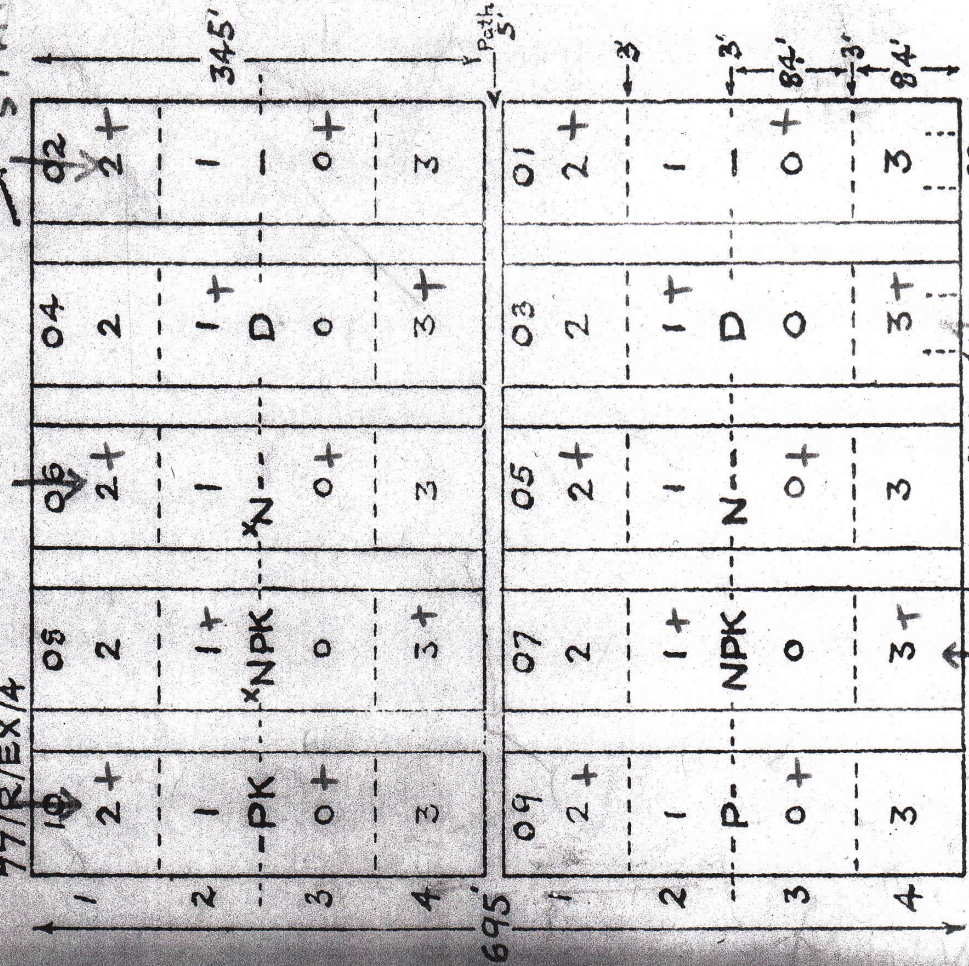
4
HOOSFIELD 1977

BARLEY

122nd Year

Rothamsted EXHAUSTION LAND

77/R/EX/4



TREATMENTS per hectare (acre)
N Co Sub-Plots - 2nd Year, bare followed in 1975 (N rates to rotate every year)
 0, 1, 2, 3 None, 48, 96, 144 kg N as Nitro-Chalk 25 (- 43, 86, 129 lb N)

Basal manuring: None

Variety: Julia, seed dressed with ethirimol sown at 140 lb/acre (157 kg/ha) on 9/3/77

Residuals of Manures applied to POTATOES
 Annually 1876-1901

NPK D
 No manure since 1852
 400 lb (448 kg/ha) Sulphate of ammonia
 550 lb (617 kg) Nitrate of soda
 400 lb (448 kg) Superphosphate
 300 lb (336 kg) Sulphate of potash } K with Na, Mg
 100 lb (112 kg) Sulphate of soda
 100 lb (112 kg) Sulphate of magnesia }
 14 tons (35 tonnes) farmyard manure

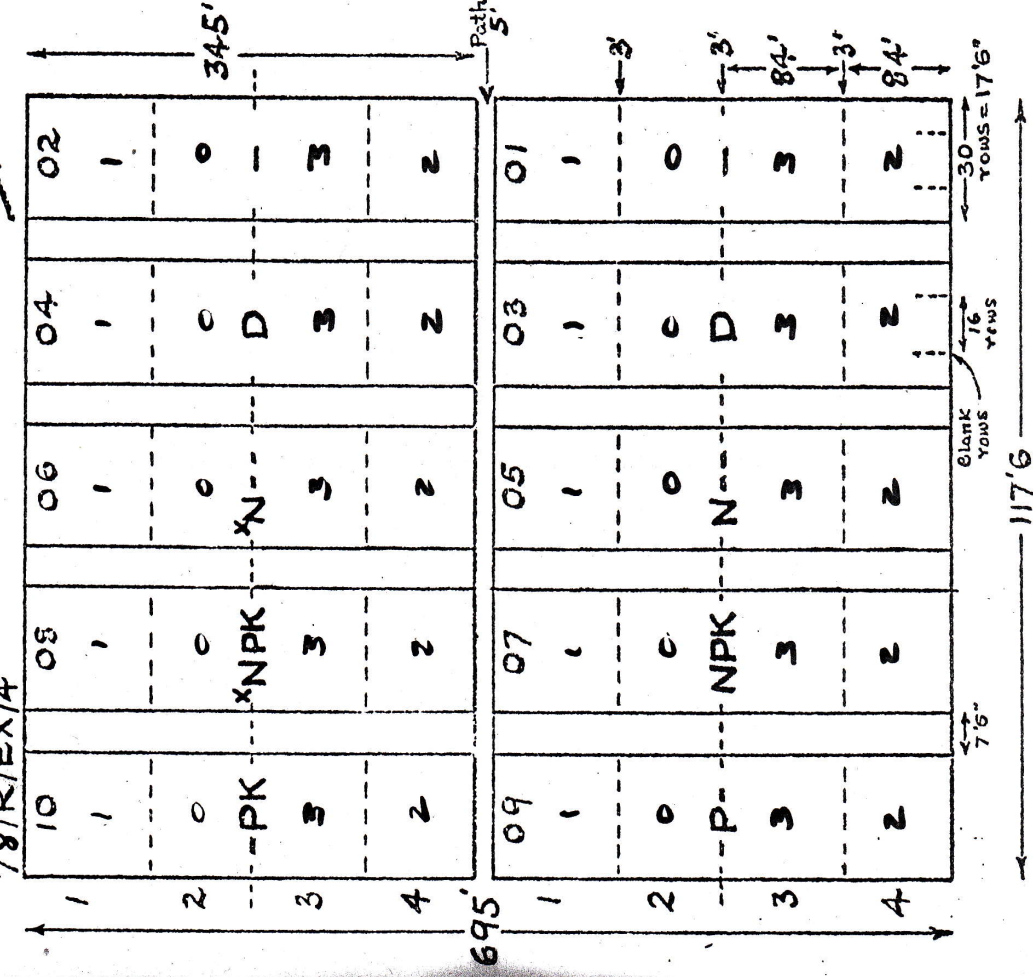
Plot area: 17'6" x 345' = 0.139 acre (0.056 ha)
Sub-plot 17'6" x 84' = 0.034 acre (0.014 ha)
Harvested: 9'4" x 84' = 0.018 acre (0.0073 ha)

N sequence

1976	77	78	79	80	81
0	3	2	1	0	3
1	0	3	0	2	1
2	1	0	3	1	0
3	2	1	0	3	2

W 151 9/18/77

Rothamsted EXHAUSTION LAND 123rd Year BARLEY HOOSFIELD 1978
 78/R/EX/4 (J.F.J., A.E.J., J.M.)



TREATMENTS per hectare (acre)

N to Sub-Plots - 3rd Year (N rates rotate every year) *
 0, 1, 2, 3 None, 48, 96, 144 kg N as Nitro-Chalk 25 (- 43, 86, 129 lb N).

Basal manuring: None

Variety: Julia, seed dressed with ethirimol
 sown at 140 lb/acre (157 kg/ha) on 31 March

Residuals of Manures applied to POTATOES
 Annually 1876-1901

- N manure since 1852
- 400 lb (448 kg/ha) sulphate of ammonia
- 550 lb (617 kg) nitrate of soda
- 400 lb (448 kg) superphosphate
- 300 lb (336 kg) sulphate of potash } K with
- 100 lb (112 kg) sulphate of soda. } Na, Mg
- 100 lb (112 kg) sulphate of magnesium
- 14 tons (35 tonnes) farmyard manure

Plot area: 17'6" x 34'5" = 0.139 acre (0.056 ha)
 Sub-plot 17'6" x 8'4" = 0.034 acre (0.014 ha)
 Harvested: 9'4" x 8'4" = 0.018 acre (0.0073 ha)

* N sequence

1976	1977	1978	79	80	81
0	3	2	1	0	0
1	0	3	3	1	2
2	1	0	0	2	3
3	2	1	0	0	1

Rothamsted EXHAUSTION LAND 12 4 Year BARLEY HOOSFIELD 1979

Sponsors: J.F. Jenkin, A.E. Johnston, J. McCuen

TREATMENTS per hectare (acre)

N to Sub-Plots

(N rates rotate every year)
 0, 1, 2, 3 None, 48, 96, 144 kg N as Nitro-Chalk
 (- 43, 86, 129 lb N)

Basal manuring: None

Variety: Julia, seed dressed with ethiri^{not}
 sown at 140 lb/acre (157 kg/ha) on 18 April

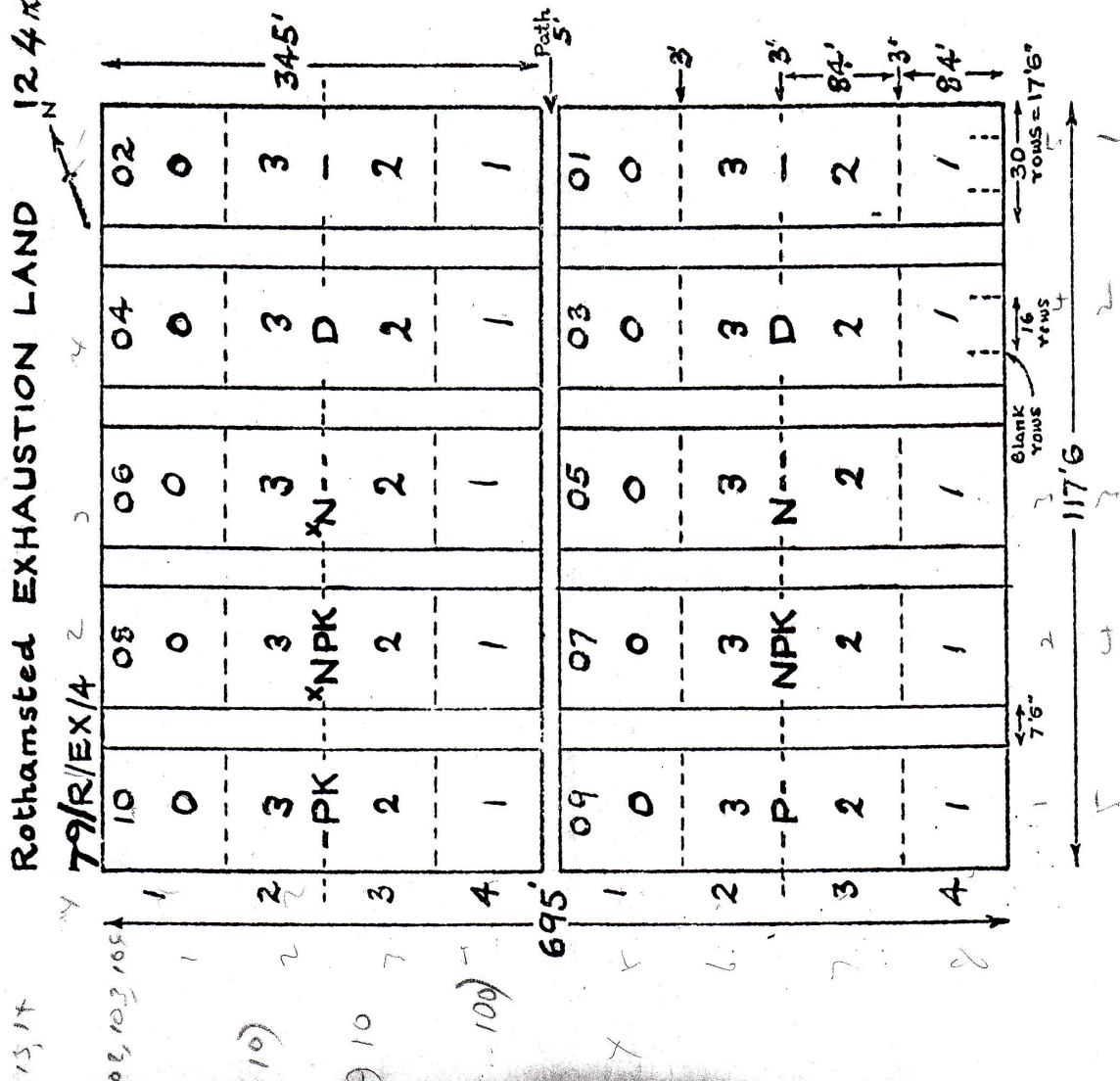
Residuals of Manures applied to POTATO

Annually 1876 - 1901

- NPK D
 No manure since 1852
 400 lb (448 kg/ha) sulphate of ammonia
 550 lb (617 kg) nitrate of soda
 400 lb (448 kg) superphosphate
 300 lb (336 kg) sulphate of potash } K²O
 100 lb (112 kg) sulphate of soda } Na₂O
 100 lb (112 kg) sulphate of magnesia } MgO
 14 tons (35 tonnes) farmyard manure

Plot area: 17'6" x 34'5" = 0.139 acre (0.056)
 sub-plot 17'6" x 8'4" = 0.034 acre (0.014)
 Harvested: 9'4" x 8'4" = 0.018 acre (0.0073)

* N sequence 1976 77 78 79 80 81
 0 1 2 3 1 0 3
 1 3 0 3 3 2 3
 3 2 1 0 2 1 2



Rothamsted EXHAUSTION LAND 12.5 Year BARLEY HOOSFIELD 1980 4

Sponsors J.F. Jenkin, A.F. Johnston, J. McCuen

TREATMENTS per hectare (acre)
N to Sub-Plots (Started 1976)

(N rates rotate every year)*
0, 1, 2, 3 None, 48, 96, 144 kg N as Nitro-Chalk 26
(- 43, 86, 129 lb N)

Basal manuring: None

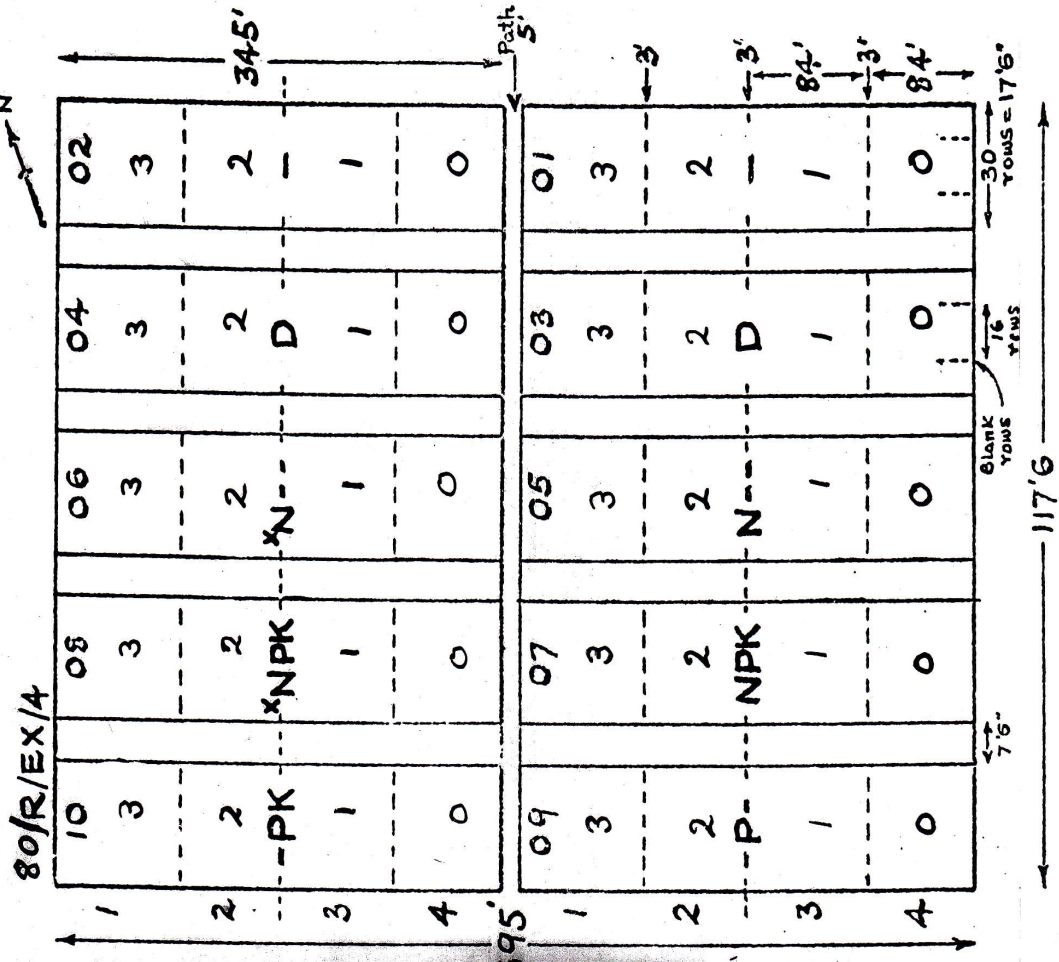
Variety: Georgie, seed/dressed with ethirimol ^{not} 9 April
Sown at 140 lb/acre (157 kg/ha)

Residuals of Manures applied to POTATOES
Annually 1876-1901

- N NPK D
No manure since 1852
400 lb (448 kg/ha) Sulphate of ammonia
550 lb (617 kg) Nitrate of soda
400 lb (448 kg) Superphosphate
300 lb (336 kg) Sulphate of potash } K with Na, Mg
100 lb (112 kg) Sulphate of soda
100 lb (112 kg) Sulphate of magnesia
14 tons (35 tonnes) farmyard manure

Plot area: 17'6" x 345' = 0.139 acre (0.056 ha)
Sub-plot 17'6" x 84' = 0.034 acre (0.014 ha)
Harvested: 9'4" x 84' = 0.018 acre (0.0073 ha)

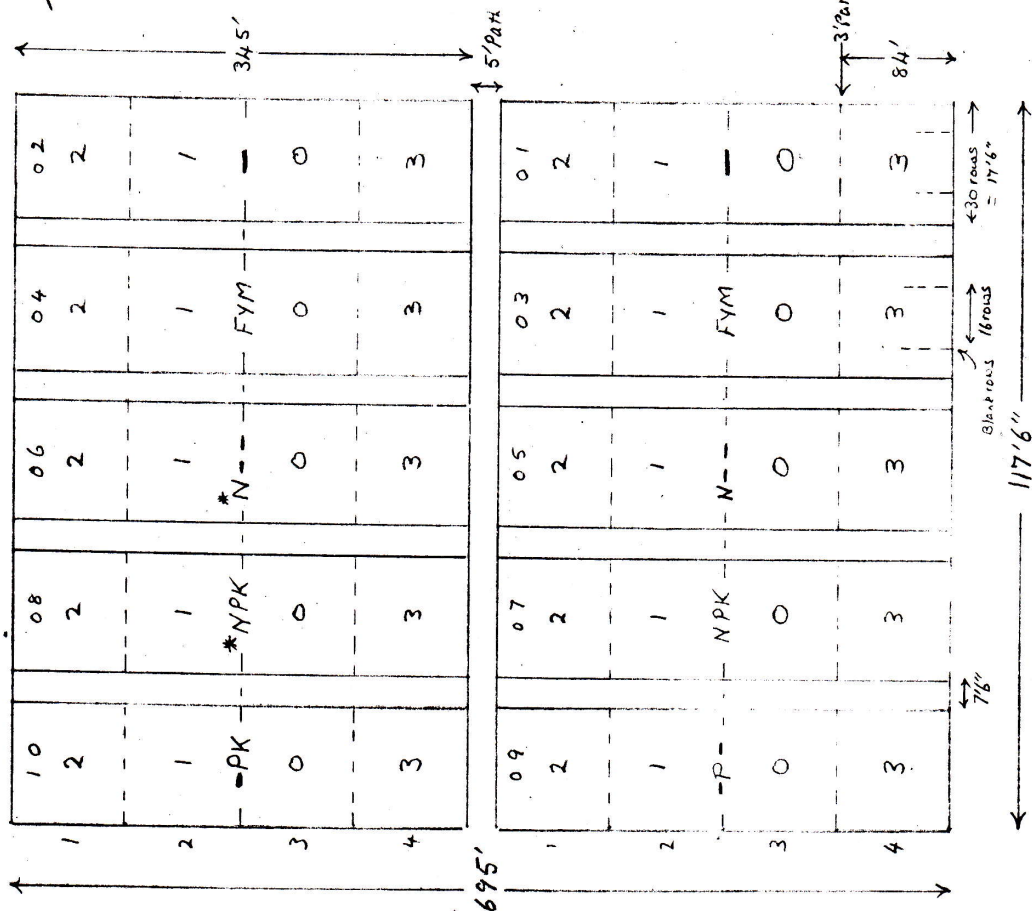
* N sequence 1976 77 78 79 80 81
0 3 2 1 0 3
1 0 3 3 0 3
2 3 0 1 2 3



NOTE: Northern sidebands to receive N at 96 kg/ha in 1980

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81/R/EX/14 ROTHAMSTED EXHAUSTION LAND 126th YEAR BARLEY HOOSFIELD 1981



Sponsors: T. Fenby, A.E. Johnston, J. McEwen

TREATMENTS Per hectare (acre)

N to Sub-Plots (Started 1976)

(N rates rotate every year)

0, 1, 2, 3 None, 48, 96, 144 kg N as Nitro-Chalk, 26% N
(-, 43, 86, 129 lb N)

BASAL MANURING: None

VARIETY: Georgie, seed dressed with Ekaminol
Sown at 140 lb/acre (157 kg/ha) on 18 February

RESIDUALS OF MANURES APPLIED TO POTATOES

ANNUALLY 1876 - 1901

-	No manure since 1852	
N	400 lb/AC (448 kg/ha)	Sulphate of ammonia
*N	550 " " (617 " ")	Nitrate of Soda
P	400 " " (448 " ")	Superphosphate
K	300 " " (336 " ")	Sulphate of potash
	100 " " (112 " ")	Sulphate of Soda
	100 " " (112 " ")	Sulphate of Magnesia
FYM	14 tons (35 tonnes)	Farmyard manure

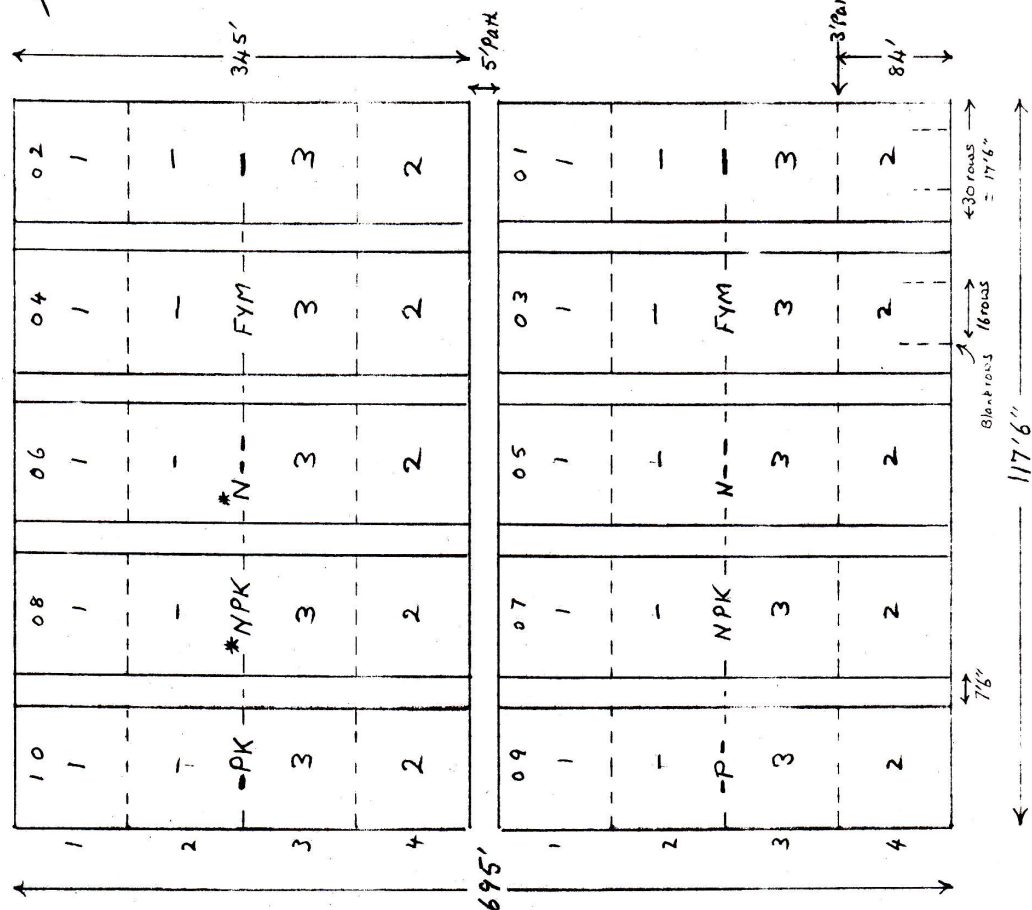
PLOT AREA: 17'6" x 345' = 0.139 AC (0.056 ha)

Sub-Plot 17'6" x 84' = 0.034 " (0.014 ")

Harvested 9'4" x 84' = 0.018 " (0.0073 ")

T	N Sequence	1980	'81	'82	'83	'84	'85
		0	3	2	1	0	3
		1	0	3	2	1	0
		2	1	0	3	2	1
		3	2	1	0	3	2

82/R/Ex/14 ROTHAMSTED EXHAUSTION LAND 12TH YEAR BARLEY HOOSFIELD 1982



Sponsors: J. F. Temlyn, A. E. Johnston, J. McEwen

TREATMENTS Per hectare (acre)

N to Sub-plots (Started 1976)
(N rates rotate every year)

- , 1, 2, 3 None, 48, 96, 144 kg N as Nitro-chalk, 26% N
(- , 43, 86, 129 lb N)

BASAL MANURING: None

VARIETY: Georgie, seed dressed with Etharimol
Sown at 140 lb/acre (157 kg/ha) on 30 March

RESIDUALS OF MANURES APPLIED TO POTATOES

ANNUALLY 1876-1901

-	No Manure since 1852	
N	400 lb/AC (448 kg/ha)	Sulphate of ammonia
*N	550 " " (617 " ")	Nitrate of Soda
P	400 " " (448 " ")	Superphosphate
K	300 " " (336 " ")	Sulphate of Potash
	100 " " (112 " ")	Sulphate of Soda
	100 " " (112 " ")	Sulphate of Magnesia
FYM	14 tons (35 tonnes)	Farmyard manure

PLOT AREA: 17'6" x 345' = 0.139 acre (0.056 ha)

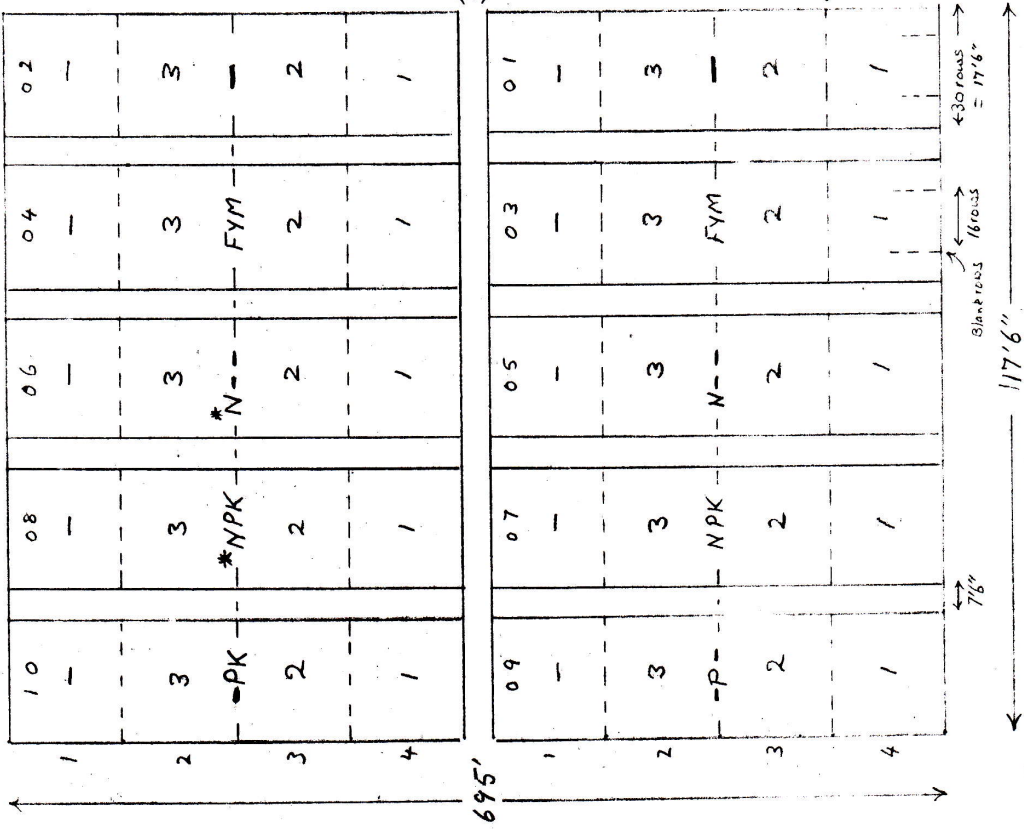
Sub-Plot Harvested

17'6" x 84'	= 0.034 "	(0.014 ")
9'4" x 84'	= 0.018 "	(0.0073 ")

+ N Sequence	1980	'81	'82	'83	'84	'85
	0	3	2	1	0	3
	1	0	3	2	1	0
	2	1	0	3	2	1
	3	2	1	0	3	2

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83/R/EX/4 ROTHAMSTED EXHAUSTION LAND 128th YEAR BARLEY HOOSFIELD 1983



TREATMENTS Per hectare (acre)

N to Sub-Plots (Started 1976)

(N rates rotate every year)
 -, 1, 2, 3 None, 48, 96, 144 kg N as Nitro-Clak, 26% N
 (-, 43, 86, 129 lb N)

BASAL MANURING: None

VARIETY: Georgie, seed dressed with Ekurimol,
 Sown at 140 lb/acre (157 kg/ha) on 10/3/83

RESIDUALS OF MANURES APPLIED TO POTATOES

ANNUALLY 1876 - 1901

-	No Manure since 1852	Sulphate of ammonia
N	400 lb/AC (448 kg/ha)	Nitrate of Soda
*N	550 " " (617 " ")	Superphosphate
P	400 " " (448 " ")	Sulphate of potash
K	300 " " (336 " ")	Sulphate of Soda
	100 " " (112 " ")	Sulphate of Magnesia
FYM	100 " " (112 " ")	Farmyard manure
	14 tons (35 tonnes)	

PLOT AREA: 17'6" x 34'5" = 0.139 acre (0.056 ha)

Sub-Plot 17'6" x 8'4" = 0.034 " (0.014 ")

Harvested 9'4" x 8'4" = 0.018 " (0.0073 ")

+ N Sequence	1980	'81	'82	'83	'84	'85
	-	3	2	1	-	3
	1	-	3	2	1	-
	2	1	-	3	2	1
	3	2	1	-	3	2

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84/R/Ex/4 ROTHAMSTED EXHAUSTION LAND 129 H YEAR BARLEY HOOSFIELD 1984

Sponsors: J. F. Tembyn, A. E. Johnston, J. McEwen

TREATMENTS Per hectare (acre)

N to Sub-plots (Started 1976)
(N rates rotate every year)
None, 48, 96, 144 kg N as Nitro-Clark, 26% N

- 1, 2, 3
(- , 43, 86, 129 lb N)

BASAL MANURING: None

VARIETY: Triumph, seed dressed with Baytan, sown at 140 lb/acre (157 kg/ha) on 10 March

RESIDUALS OF MANURES APPLIED TO POTATOES

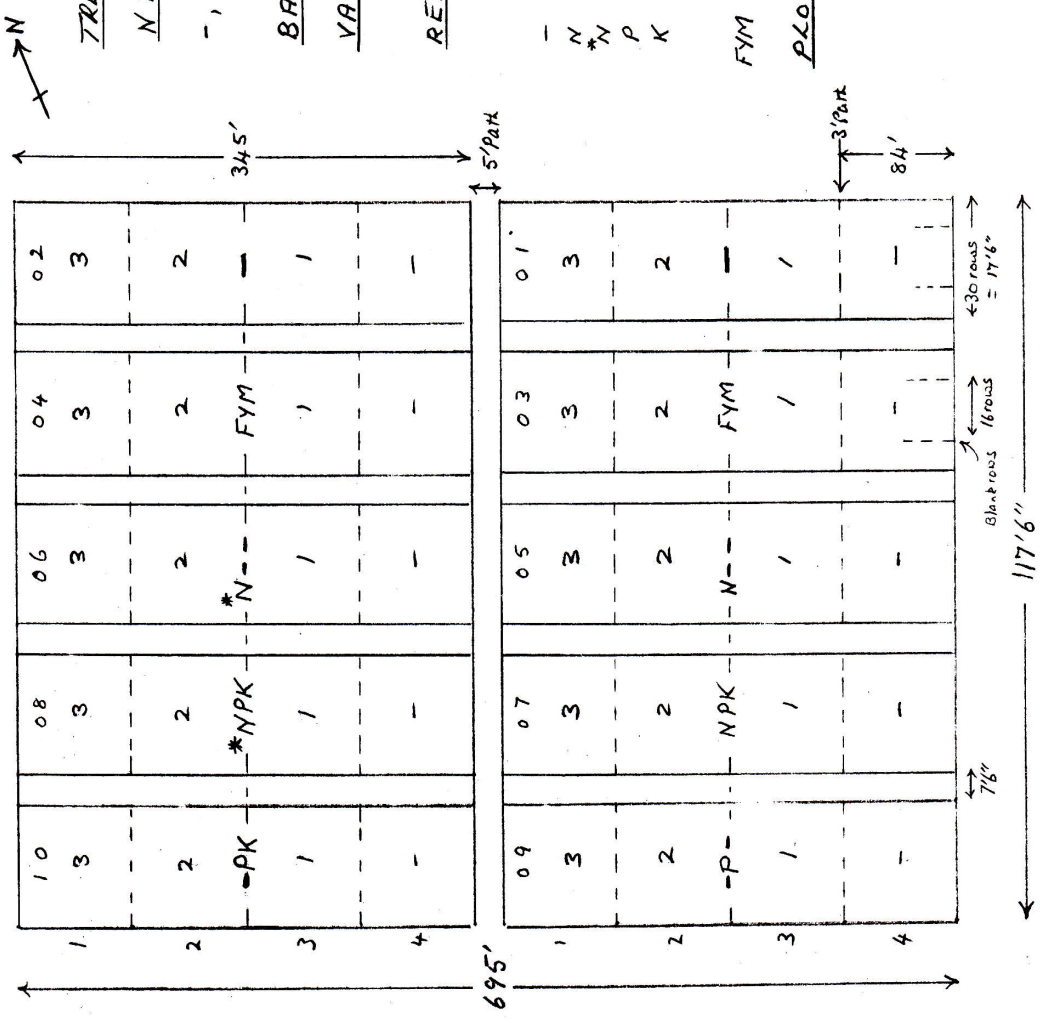
ANNUALLY 1876-1901

-	No Manure since 1852	
N	400 lb/AL (448 kg/ha)	Sulphate of ammonia
*N	550 " " (617 " ")	Nitrate of Soda
P	400 " " (448 " ")	Superphosphate
K	300 " " (336 " ")	Sulphate of potash
	100 " " (112 " ")	Sulphate of Soda
	100 " " (112 " ")	Sulphate of Magnesia
FYM	14 tons (35 tonnes)	Farmyard manure

PLOT AREA: 17'6" x 34'5" = 0.139 acre (0.056 ha)

Sub-Plot Harvested 17'6" x 8'4" = 0.034 " (0.014 ")
9'4" x 8'4" = 0.018 " (0.0073 ")

+ N Sequence	1980	181	182	183	184	185	186
		3	2	1	-	3	2
		1	-	3	2	1	-
		2	1	-	3	2	1
		3	2	1	-	3	2



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ROTHAMSTED EXHAUSTION LAND 130 K. YEAR BARLEY HOOSFIELD 1985

Sponsors: T. F. Temby, R. E. Johnston, J. McEwen

TREATMENTS Per hectare (acre)

N to Sub-plots (Started 1976)

(N rates rotate every year)

1, 2, 3 None, 48, 96, 144 kg N as Nitro-Clark, 27.5% N
(, 43, 86, 129 lb N)

BASAL MANURING: None

VARIETY: Triumph, seed dressed with Baytan, sown at 157 kg/ha on 18 March

RESIDUALS OF MANURES APPLIED TO POTATOES

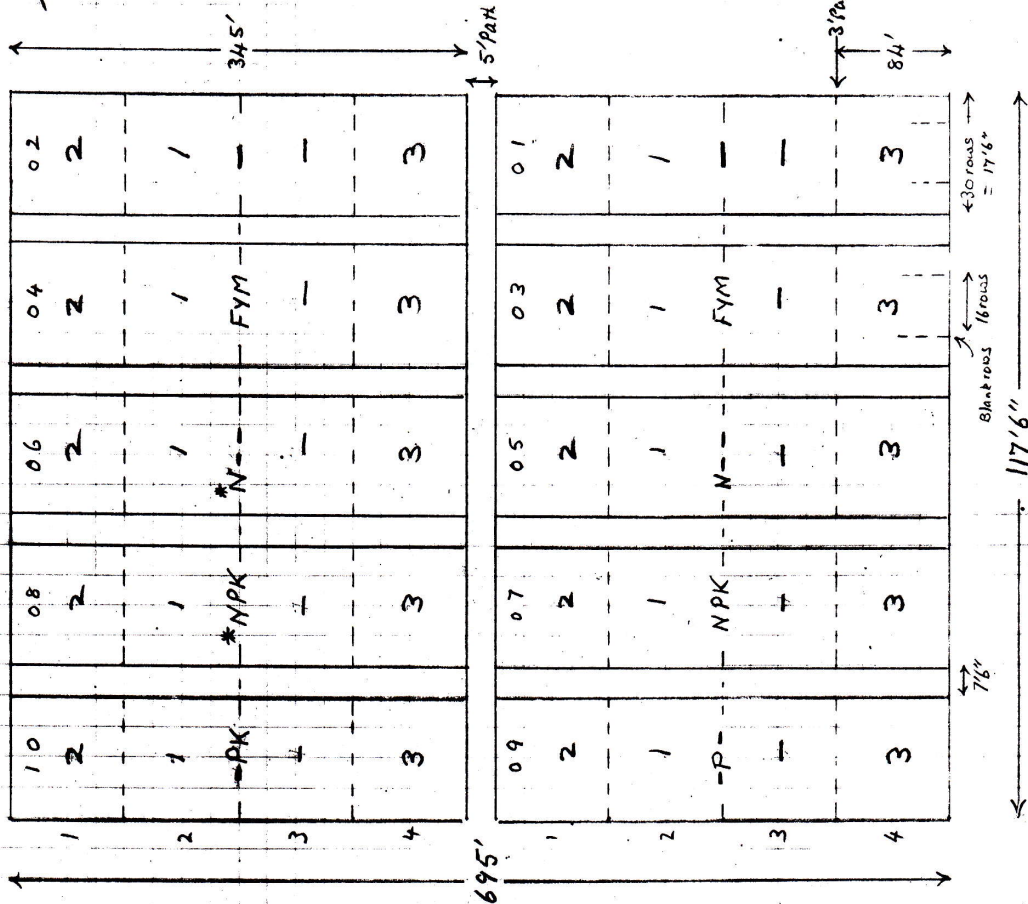
ANNUALLY 1876-1901

-	No Manure since 1852	
N	400 lb/AC (448 kg/ha)	Sulphate of ammonia
*N	550 " " (617 " ")	Nitrate of Soda
P	400 " " (448 " ")	Superphosphate
K	300 " " (336 " ")	Sulphate of potash
	100 " " (112 " ")	Sulphate of Soda
	100 " " (112 " ")	Sulphate of Magnesia
FYM	14 tons (35 tonnes)	Farmyard manure

PLOT AREA: 17'6" x 345' = 0.139 acre (0.056 ha)

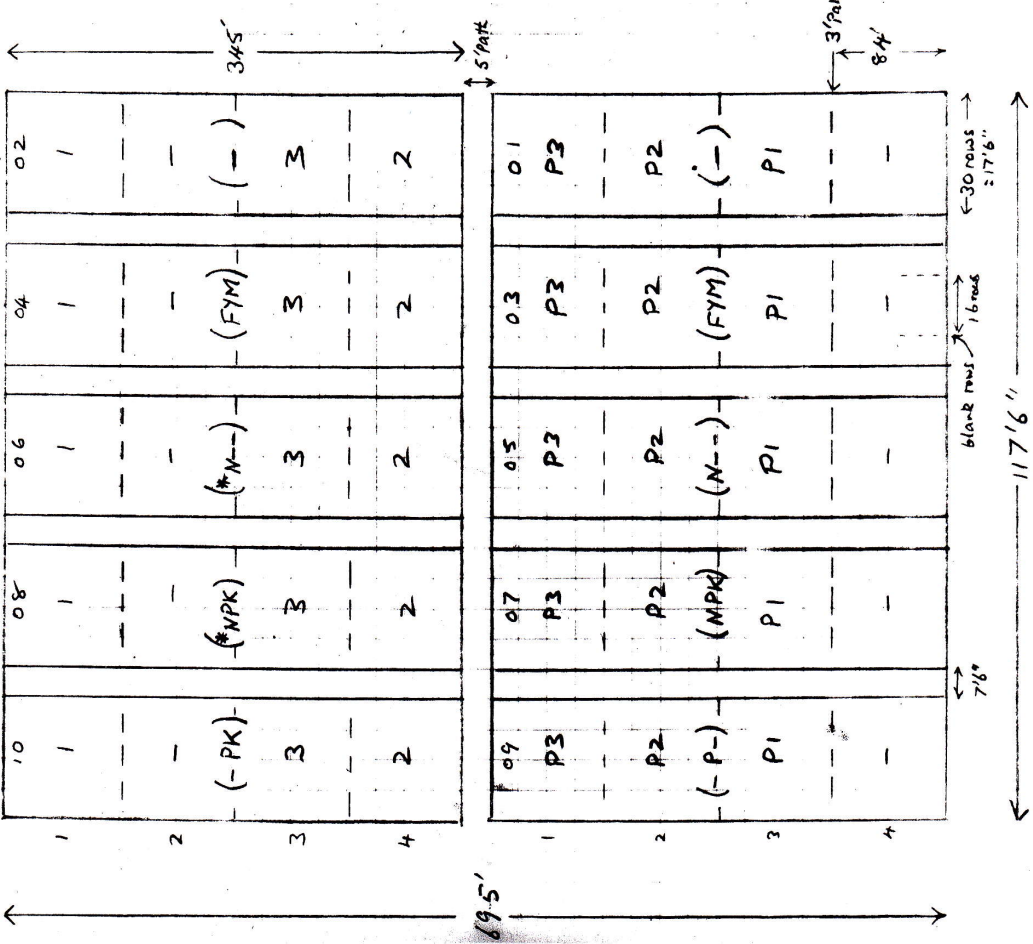
Sub-plot	17'6" x 84'	= 0.034 "	(0.014 ")
Harvested	9'4" x 84'	= 0.018 "	(0.0073 ")

† N sequence	1980	'81	'82	'83	'84	'85	'86	'87
	-	3	2	1	-	3	2	1
	1	-	3	2	1	-	3	2
	2	1	-	3	2	1	-	3
	3	2	1	-	3	2	1	-



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86/R/EX/4 ROTHAMSTED EXHAUSTION LAND 131 SE. YEAR S. BARLEY HOOSFIELD 1986



Sponsors: J.F. Jenkyn, A.E. Johnston, J. McEwen

TREATMENTS Per Aa. (acre)
 N to sub-plots (most half plots 0.7, 0.4, 0.6, 0.8, 1.0), in 1986. Started on all plots 1976.

1, 1, 2, 3. None, 48, 96, 144 kg N as Nitram, 33.5% N
 (, 43, 86, 129 lb N)
 N sequence - to 3 to 2 to 1, rotating every year.

P to sub-plots (East half only plots 01, 03, 05, 07, 09) started 1986

None
 P1 100 kg P₂O₅ (annually until index 1 achieved on most impoverished plots)
 P2 200 " " (Annually until index 2 achieved)
 P3 300 " " (" " " 3 " " ")

BASAL MANURING (Eastern half plots 01, 03, 05, 07, 09) started 1986
 N at 144 kg N ha⁻¹ + K at 100 kg K₂O ha⁻¹

VARIETY Triumph, dressed 'Baytan', followed by fungicide strips as recommended by county miller
 approx 2 May

RESIDUALS OF MANURES APPLIED TO POTATOES ANNUALLY 1876-1901

N	400 lb/ac (448 kg/ha)	Sulphate of Ammonia
*N	550 " " (617 " ")	Nitrate of Soda
P	400 " " (448 " ")	Superphosphate
K	300 " " (336 " ")	Sulphate of Potash
	100 " " (112 " ")	Sulphate of Soda
	100 " " (112 " ")	Sulphate of Magnesia
FYM	14 tons (35 tonnes)	Farmyard manure

PLOT AREA 17'6" x 345' = 0.139 ac (0.056 ha)
 17'6" x 84' = 0.034 " (0.014 ")
 84" x 9'4" x 84" = 0.018 " (0.0073 ")