ROTHAMSTED RESEARCH

Report for 1930

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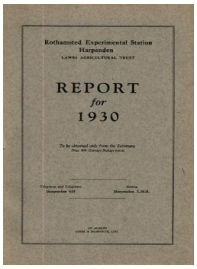


Experiments at Other Centres

Rothamsted Research

Rothamsted Research (1931) *Experiments at Other Centres ;* Report For 1930, pp 155 - 171 **- DOI: https://doi.org/10.23637/ERADOC-1-63**

REPLICATED EXPERIMENTS AT OUTSIDE CENTRES

Grassland. Meadow Hay.

(Basic Slag Committee).

Mr. W. Eydes, Walton Lodge Farm, Walton, Chesterfield, Derby, 1930.

Permanent grass.

I.	H	L	M	O	S
II.	M	H	O	S	L
III.	S	O	L	M	H
IV.	L	M	S	H	O
V.	O	S	H	L	M

SYSTEM OF REPLICATION: Latin Square
AREA OF EACH PLOT: 1/15 acre.
Soil: Clay 6 in. deep.
TREATMENTS:
O=Control.
S=Super.
M=Mineral Phosphate.
L=Low Soluble Slag (23.0%).
H=High soluble Slag (96.5%).
Dressings providing 1 cwt. P_2O_5 per acre, applied Feb. 4th.
Hay cut: July 15th. Weighed: Aug. 7th-8th.

Actual weights in lb.

Row.	O	M	L	H	S
I. ..	175	183	165	152	203
II. ..	217	179	225	226	225
III. ..	197	224	236	235	186
IV. ..	231	210	216	254	292
V. ..	207	186	204	177	234

Summary of Results

Average Yield.	Control.	Mineral Phosphate.	Low Sol. Slag.	High Sol. Slag.	Super-Phosphate.	Mean.	Standard Error.
Cwt. per acre	27.5	26.3	28.0	28.0	30.5	28.1	1.28
Per cent. ..	98.0	93.7	99.8	99.6	108.8	100.0	4.54

The response to the dressings of mineral phosphate and high and low soluble slags are not significant. The plots treated with superphosphate give a significantly higher yield than any of the others.

https://doi.org/10.23637/ERADOC-1-63

Grassland. Meadow Hay.

(Basic Slag Committee).

Mr. W. H. Limbrick, Badminton Farm, Badminton, Glos., 1930.

Permanent grass.

I.	S	O	L	M	H
II.	M	L	H	O	S
III.	O	H	M	S	L
IV.	H	S	O	L	M
V.	L	M	S	H	O

SYSTEM OF REPLICATION: Latin Square.
AREA OF EACH PLOT: 1/10th acre.
Soil: Light red loam 8 in. deep.
TREATMENTS:
O = Control.
S = Super.
M = Ground Mineral Phosphate.
L = Low soluble Slag (23.0%).
H = High soluble Slag (96.5%).
Dressings providing 1 cwt. P_2O_5 per acre, applied Jan. 31st-Feb. 1st.
Hay cut: June 16th. Weighed: June 20th-24th.

Actual weights in lb.

Row.	Hay as weighed.					Air dry weights.				
	O	M	L	H	S	O	M	L	H	S
I. ..	442	420	422	403	512	345	335	333	299	380
II. ..	472	402	446	478	490	362	332	355	368	380
III. ..	479	520	489	504	553	379	388	374	395	420
IV. ..	551	434	494	514	559	451	383	412	413	449
V. ..	458	547	489	516	497	337	439	410	421	382

Summary of Results.

Average yield.	Control.	Mineral Ph'phate.	Low Sol. Slag.	High Sol. Slag.	Super-ph'phate.	Mean.	Standard Error.
Hay as weighed—							
Cwt. per acre ..	42.9	41.5	41.8	43.1	46.6	43.2	1.33
Per cent. ..	99.3	96.1	96.8	99.9	108.0	100.0	3.07
Air dry weights—							
Cwt. per acre ..	33.5	33.5	33.6	33.9	35.9	34.1	1.01
Per cent. ..	98.2	98.4	98.7	99.4	105.4	100.0	2.96

There has been no response to the slags, or to mineral phosphate. The yield of hay as weighed in the field was significantly increased by the dressing of superphosphate. This increase, when expressed as air-dried hay was, however, much smaller, and hardly significant.

https://doi.org/10.23637/ERADOC-1-63

Barley: Effect of Nitrogenous Fertilisers, and of Sulphate of Potash and Superphosphate.

H. G. Nevile, Esq., Wellingore, 1930.

Plan and Actual Weights in grams per sample.

Grain								Straw							
K 172	KP 265	K 177	KP 214	KP 262½	O 213½	P 124	K 115	K 211	KP 280½	K 179½	KP 234	KP 320½	O 246½	P 144½	K 159½
P 159	O 159	O 159	P 129	K 196½	P 219½	O 184½	KP 124	P 177	O 161	O 192	P 160½	K 261	P 291	O 226	KP 161½
P 128	K 182	K 236½	P 182½	K 116	P 146	KP 196½	P 199½	P 148½	K 229	K 250	P 201½	K 133½	P 159½	KP 234	P 253
KP 188	O 179½	KP 183	O 156	KP 98½	O 134	K 209½	O 170½	KP 216½	O 193	KP 208½	O 173½	KP 122	O 181½	K 237½	O 216
O 107½	KP 134	KP 167½	P 196½	P 189½	O 144½	KP 195½	O 159½	O 64	KP 134½	KP 194½	P 222½	P 214½	O 180½	KP 271½	O 204½
P 119½	K 118	K 134	O 149	KP 191	K 207½	P 190	K 214½	P 125½	K 115½	K 147½	O 166½	KP 205	K 223½	P 210	K 250½
P 191	KP 153½	K 103½	P 90	P 180	KP 225	K 198½	O 223½	P 201½	KP 162	K 99	P 99½	P 216	KP 255½	K 201½	O 237
O 155	K 170½	KP 97	O 80	K 153	O 172½	KP 212½	P 165½	O 167	K 172½	KP 103	O 84½	K 186½	O 222	KP 226	P 210½

Plan showing Nitrogenous Treatments applied to whole plots.

N	C	S	O
S	N	O	C
O	S	C	N
C	O	N	S

SYSTEM OF REPLICATION: Latin Square.

AREA OF EACH WHOLE PLOT: 1/50th acre.

Soil: Light loam on Oölitic limestone.

TREATMENTS:
O = No Nitrogen.
C = Cyanamide.
N = Nitrate of Soda.
S = Sulphate of Ammonia
} at the rate of 0.2 cwt. N per acre.

Plots sub-divided to receive no Potash or Superphosphate (O), Sulphate of Potash (K) at the rate of 0.6 cwt. K_2O per acre, Superphosphate (P) at the rate of 0.4 cwt. P_2O_5 per acre, and Sulphate of Potash and Superphosphate (KP).

Plots harvested by sampling method.

Manures applied: March 10th.

Barley sown: March 10th. Harvested: August 22nd.

Variety: Plumage Archer.

Previous Crop: Barley.

M

https://doi.org/10.23637/ERADOC-1-63

Barley, Wellingore, 1930 (*cont.*)

Summary of Results.

Average Yield in cwt. per acre.	Grain					Straw				
	No Nitrogen	Cyana-mide	Nitrate of Soda	Sulph. Amm.	Mean	No Nitrogen	Cyana-mide	Nitrate of Soda	Sulph./ Amm.	Mean
No Potash or Super.	11.0	13.7	14.1	16.7	13.9	12.1	16.5	16.6	18.4	15.9
Sulphate of Potash ..	9.9	16.7	16.9	15.5	14.8	11.1	17.7	19.6	18.3	16.7
Superphosphate ..	10.4	15.4	15.5	15.5	14.2	11.5	18.1	17.5	19.0	16.5
Potash and Super. ..	9.9	16.4	18.9	18.1	15.8	11.3	18.2	22.1	20.9	18.1
Mean	10.3	15.6	16.4	16.4	14.7	11.5	17.6	19.0	19.2	16.8
Standard Error ..	1.14					1.25				
Per cent.										
No Potash or Super.	75.2	93.5	96.1	113.7	94.6	72.1	98.0	98.7	109.3	94.6
Sulphate of Potash ..	67.2	113.6	115.3	105.6	100.4	65.8	105.4	116.5	108.8	99.1
Superphosphate ..	71.2	105.3	105.7	105.4	96.9	68.6	107.6	104.3	113.1	98.4
Potash and Super. ..	67.4	112.2	129.0	123.4	108.0	67.6	108.3	131.8	124.2	108.0
Mean	70.2	106.2	111.6	112.0	100.0	68.6	104.8	112.8	113.8	100.0
Standard Error ..	7.78					7.44				

Significant response to all forms of nitrogenous fertiliser for both grain and straw, but the differences between the yields of plots having sulphate of ammonia, nitrate of soda and cyanamide are not significant. The response to potash is significant for grain, but only in the presence of a nitrogenous dressing: while that to phosphate is not significant for either grain or straw.

https://doi.org/10.23637/ERADOC-1-63

Barley: Effect of Nitrogenous Fertilisers, and of Sulphate of Potash and Superphosphate.

Mr. J. M. Templeton, Farm Institute, Sparsholt, Winchester, 1930.

Plan and Actual Weights in grams per sample.

Grain								Straw							
P	KP	O	P	K	KP	K	KP	P	KP	O	P	K	KP	K	KP
219	186½	162½	132½	146	161	152	90½	223½	185½	174	152½	161½	192½	136	105
O	K	K	KP	O	P	P	O	O	K	K	KP	O	P	P	O
174½	188½	165	164	131	192	147	163	167½	180½	138	158½	148½	193½	152½	145
KP	O	O	KP	O	KP	KP	P	KP	O	O	KP	O	KP	KP	P
209½	240½	171	219	140	209	234½	159½	206½	241	173	206	157	177½	218½	153
K	P	P	K	P	K	K	O	K	P	P	K	P	K	K	O
203	259	207	151	205	206	183	201	204	245	186½	142	207	194½	185½	196½
P	O	P	KP	K	P	KP	P	P	O	P	KP	K	P	KP	P
236½	203	160½	191	177	172½	185	133½	229½	197	150½	157½	178½	167	168	135½
KP	K	O	K	KP	O	K	O	KP	K	O	K	KP	O	K	O
257½	207½	160½	176½	170½	163	173	156½	249½	210	152½	171½	176	173½	171½	161½
P	KP	K	O	P	KP	O	P	P	KP	K	O	P	KP	O	P
249½	220½	215½	232½	150	183	163½	126	229	231½	213	228	163½	179½	154½	135½
O	K	KP	P	K	O	KP	K	O	K	KP	P	K	O	KP	K
259	230	245	262	175	207½	174½	102	240½	215	243	248	147	206	160½	130

Plan showing Nitrogenous Treatments applied to whole plots.

O	C	N	S
C	S	O	N
N	O	S	C
S	N	C	O

SYSTEM OF REPLICATION: Latin Square.
AREA OF EACH WHOLE PLOT: 1/50th acre.
Soil: Thin flinty loam on chalk.
Variety: Plumage Archer.

TREATMENTS:
O = No Nitrogen.
C = Cyanamide.
N = Nitrate of Soda.
S = Sulphate of Ammonia.
} at the rate of 0.2 cwt. N per acre.

Plots sub-divided to receive no Potash or Superphosphate (O), Sulphate of Potash (K), at the rate of 0.6 cwt. K_2O per acre, Superphosphate (P) at the rate of 0.4 cwt. P_2O_5 per acre, and Sulphate of Potash and Superphosphate (KP).

Plots harvested by sampling method.

Manures applied: March 25th-26th.

Barley sown: April 15th. Harvested: August 12th-13th.

Previous Crop: Barley.

https://doi.org/10.23637/ERADOC-1-63

Barley, Sparsholt, 1930 (*cont.*)

Summary of Results.

Average Yield in cwt. per acre.	Grain.					Straw.				
	No Nitrogen	Cyana-mide	Nitrate of Soda	Sulph./ Amm.	Mean	No Nitrogen	Cyana-mide	Nitrate of Soda	Sulph./ Amm.	Mean
No Potash or Super.	11.9	14.3	14.3	14.1	13.6	11.8	14.6	14.4	13.7	13.6
Sulphate of Potash ..	12.6	13.4	14.0	13.3	13.3	12.6	12.3	14.4	12.5	13.0
Superphosphate ..	13.3	12.6	15.9	14.5	14.1	13.4	13.0	15.4	13.7	13.9
Potash and Super. ..	14.2	13.8	16.8	13.1	14.5	12.7	13.3	16.9	13.4	14.1
Mean	13.0	13.5	15.2	13.8	13.9	12.6	13.3	15.3	13.3	13.6
Standard Error ..			0.92					0.69		
Per cent.										
No Potash or Super.	85.9	103.2	103.3	101.7	98.5	86.5	107.2	105.5	100.3	99.9
Sulphate of Potash ..	90.5	96.3	101.2	95.5	95.9	92.7	90.5	105.5	92.0	95.2
Superphosphate ..	95.6	90.8	114.4	104.4	101.3	98.1	95.4	112.9	100.7	101.8
Potash and Super. ..	102.4	99.8	120.8	94.2	104.3	93.3	97.6	123.7	98.4	103.2
Mean	93.6	97.5	109.9	99.0	100.0	92.6	97.7	111.9	97.8	100.0
Standard Error ..			6.65					5.07		

Plots treated with nitrate of soda have given a significantly higher yield than all others. The response to sulphate of ammonia and cyanamide was not significant. No effect of potash. There was some evidence of a response to superphosphate, but the increase only approached significance in the presence of potash and nitrate of soda.

https://doi.org/10.23637/ERADOC-1-63

Potatoes: Effect of Superphosphate on Two Varieties.

G. Major, Esq., Newton Farm, Lincs., 1930.

	B	A	A	B	B	A	B	A
I.	0	0	2½	2½	10	10	5	5
II.	5	5	10	10	2½	2½	0	0
III.	10	10	0	0	5	5	2½	2½
IV.	2½	2½	5	5	0	0	10	10

VARIETIES: British Queen (A) and King Edward (B) in random strips.
SYSTEM OF REPLICATION: Latin Square.
AREA OF EACH SUB-PLOT: 1/60th acre.
TREATMENTS: Superphosphate at the rate of 0, 2½, (0.4 cwt. P_2O_5), 5 and 10 cwt. per acre. All plots received Sulphate of Ammonia at the rate of 0.8 cwt. N per acre and Sulphate of Potash at the rate of 2 cwt. K_2O per acre. Dunged in previous autumn.
Manures applied: April 2nd.
Potatoes planted: April 3rd. Lifted: Oct. 21st-22nd.
Previous Crop: Wheat.

Actual weights in lb.

Row.	British Queen.				King Edward.			
	0	2½	5	10	0	2½	5	10
I. ..	518	528	495	554	676	546	586	578
II. ..	476	558	532	512	559	562	611	598
III. ..	502	468	545	538	570	575	599	601
IV. ..	472	557	582	579	625	646	651	602

Summary of Results.

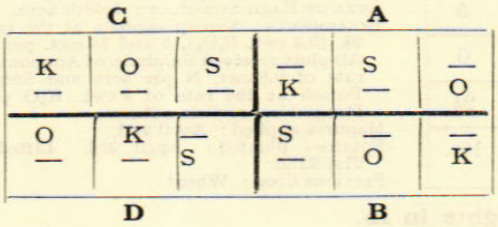
Average yield.	British Queen.				King Edward.			
	No Super.	2½ cwt. Super.	5 cwt. Super.	10 cwt. Super.	No Super.	2½ cwt. Super.	5 cwt. Super.	10 cwt. Super.
Tons per acre ..	13.18	14.14	14.42	14.62	16.27	15.60	16.39	15.93
Per cent. ..	87.5	93.8	95.7	97.0	108.0	103.5	108.7	105.7
Mean	14.09				16.05			
Standard Error ..	0.375 tons or 2.49 per cent.							

King Edwards yielded significantly better than British Queen. Significant response to British Queen variety with first dressing of superphosphate: further response to higher dressing is not significant. No response to superphosphate on King Edward variety.

https://doi.org/10.23637/ERADOC-1-63

Potatoes: Effect of Sulphate of Potash and Mineral Potash.

A. W. Oldershaw, Esq., Tunstall, Nr. Ipswich, 1930.



SYSTEM OF REPLICATION: 4 randomised blocks.
AREA OF EACH WHOLE PLOT: 1/60th acre. Each plot divided into two sub-plots.
Soil: Very light sand (almost out of cultivation).
Variety: Great Scott.
TREATMENTS:
O=Control.
S=Sulphate of Potash at the rate of 1.5 cwt. K_2O per acre.
K=Potash Mineral equivalent to Sulphate of Potash.
Sulphate of Magnesia, providing Magnesium equivalent to the Potash applied to one out of each pair of sub-plots, indicated by the treatment symbol occurring on that half.
All plots received Nitrate of Soda at the rate of 0.6 cwt. N per acre, and basic Superphosphate at the rate of 0.6 cwt. P_2O_5 per acre.
Manures applied: April 1st, except Nitrate of Soda which was applied as an early top dressing.
Potatoes planted: April 6th. Lifted: Oct. 8th-10th.

Actual weights in lb.

Block.	With Sulphate of Magnesia.			Without Sulphate of Magnesia.		
	O	S	K	O	S	K
A ..	557	486	514	461	581	423
B ..	468	547	491	418	525	490
C ..	516	520	433	547	507	438
D ..	455	447	508	459	493	503
Average in tons per acre	13.37	13.39	13.03	12.62	14.10	12.42

Summary of Results.

Average Yield.	Control.	Sulphate of Potash	Potash Mineral.	Mean.	Standard Error.	Without S/Mag.	With S/Mag.	Mean.	Standard Error.
Tons per acre ..	12.99	13.75	12.72	13.16	0.541	13.05	13.26	13.16	0.287
Per cent.	98.8	104.5	96.7	100.0	4.12	99.2	100.8	100.0	2.18

Slight non-significant advantage due to sulphate of potash. No response to potash mineral or sulphate of magnesia.

https://doi.org/10.23637/ERADOC-1-63

Potatoes: Effect of Superphosphate and Sulphate of Potash.

E. V. Cooke, Esq., The Limes, North Fen, Bourne, Lincs., 1930.

A			B		
0P 2K	1P 2K	1P 1K	0P 1K	0P 2K	1P 1K
2P 1K	0P 1K	2P 0K	2P 0K	1P 0K	2P 1K
1P 0K	2P 2K	0P 0K	1P 2K	2P 2K	0P 0K
1P 1K	0P 2K	2P 2K	1P 0K	2P 0K	0P 2K
0P 0K	1P 0K	1P 2K	1P 1K	2P 2K	1P 2K
2P 1K	2P 0K	0P 1K	0P 0K	0P 1K	2P 1K
C			D		

SYSTEM OF REPLICATION: 4 randomised blocks.
AREA OF EACH PLOT: 1/70th acre.
Soil: Black Fen land.
Variety: King Edward.
TREATMENTS: Superphosphate (P) at the rate of 0, 0.8 and 1.6 cwt. P_2O_5 per acre, and Sulphate of Potash (K) at the rate of 0, 1 and 2 cwt. K_2O per acre, in all combinations.
Manures applied: April 23rd.
Potatoes planted: April 25th.
Lifted: Sept. 25th.

Actual weights in lb.

Blocks.	1	2	3	4	5	6	7	8	9
A ..	372	293	392	360	459	388	344	439	406
B ..	334	444	437	393	385	434	366	438	439
C ..	234	291	279	295	339	297	332	413	479
D ..	262	385	338	335	382	367	297	365	421

Summary of Results.

	Tons per acre.				Per cent.			
Average yield.	No Super.	5 cwt. Super.	10 cwt. Super.	Mean.	No Super.	5 cwt. Super.	10 cwt. Super.	Mean.
No Potash ..	9.39	11.04	11.30	10.58	81.7	96.1	98.3	92.0
2 cwt. Sul./Pot. ..	10.80	12.23	11.61	11.55	94.1	106.4	101.1	100.5
4 cwt. Sul./Pot. ..	10.46	12.93	13.63	12.34	91.1	112.6	118.7	107.5
Mean	10.22	12.07	12.18	11.49	89.0	105.0	106.0	100.0
Standard Error ..	0.647				5.63			

Significant response to the single dressing of superphosphate—no further response to the double dressing. Significant response, on the average, to the single and double dressings of sulphate of potash.

https://doi.org/10.23637/ERADOC-1-63

Potatoes: Effect of Inorganic and Organic Fertilisers.
Mr. Inskip, Stanford, Biggleswade, 1930.

1.—HEAVY LAND.

I.	4	3	2	1
II.	1	2	3	4
III.	3	4	1	2
IV.	2	1	4	3

VARIETY: King Edward.
SYSTEM OF REPLICATION: Latin Square.
AREA OF EACH PLOT: 1/50th acre.
TREATMENTS:
1=Blood, Superphosphate.
2=Sulphate of Ammonia, Superphosphate.
3=Sulphate of Ammonia, Steamed Bone Flour.
4=Blood, Steamed Bone Flour.
Rates: 0.5 cwt. N and 0.6 cwt. P_2O_5 per acre. All plots received Sulphate of Potash at the rate of 1.25 cwt. K_2O per acre.
Manures applied: April 2nd-3rd.
Potatoes set: April 2nd.
Lifted: Oct. 1st.

Actual weights in lb.

Row.	1	2	3	4
I. ..	645	667	670	787
II. ..	752	637	655	576
III. ..	642	627	686	575
IV. ..	621	762	596	660

Summary of Results.

Average Yield.	Blood Super.	Sulph/Amm. Super.	Sulph/Amm. Steamed Bone Flour.	Blood Steamed Bone Flour.	Mean.	Standard Error.
Tons per acre ..	14.84	15.03	14.55	14.50	14.73	0.311
Per cent. ..	100.8	102.0	98.8	98.4	100.0	2.11

No significant differences in yield.

2.—LIGHT LAND.

— / 1	— / 2	— / 3	4 / —
— / 4	— / 3	1 / —	2 / —
— / 2	1 / —	4 / —	— / 3
3 / —	4 / —	— / 2	— / 1
IV	III.	II.	I.

VARIETY: Great Scott.
SYSTEM OF REPLICATION: Latin Square.
AREA OF EACH WHOLE PLOT: 1/50th acre. Each plot divided into two sub-plots.
TREATMENTS:
1=Blood, Superphosphate.
2=Sulphate of Ammonia, Superphosphate.
3=Sulphate of Ammonia, Steamed Bone Flour.
4=Blood, Steamed Bone Flour.
Rates: 0.3 cwt. N and 0.4 cwt. P_2O_5 per acre. Sulphate of Potash at the rate of 0.88 cwt. K_2O per acre applied to one out of each pair of sub-plots, indicated by the treatment symbol occurring on that half.
Manures applied: April 2nd-3rd.
Potatoes planted: April 2nd.
Lifted: Sept. 5th.

https://doi.org/10.23637/ERADOC-1-63

Actual weights in lb.

Row.	Potash.				No Potash.			
	1	2	3	4	1	2	3	4
I. ..	118.0	118.0	104.5	125.0	105.5	116.0	96.5	96.0
II. ..	128.0	125.0	113.5	106.5	116.5	125.0	130.5	104.0
III. ..	99.5	124.5	126.5	123.0	128.5	124.5	97.5	108.0
IV. ..	125.0	140.5	144.0	129.0	125.0	115.5	138.0	115.0
Average in tons per acre	5.25	5.67	5.45	5.40	5.31	5.37	5.16	4.72

Summary of Results.

Average Yield.	Blood, Super.	Sulph/Amm. Super.	Sulph/Amm. Bone Flour.	Blood, Bone Flour.	Mean.	Standard Error.
Tons per acre ..	5.28	5.52	5.31	5.06	5.29	0.127
Per cent. ..	99.8	104.3	100.3	95.6	100.0	2.40

Average yield.	Without Potash.	With Potash.	Mean.	Standard Error.
Tons per acre ..	5.14	5.44	5.29	0.124
Per cent.	97.1	102.9	100.0	2.35

The differences between the nitrogenous and phosphatic treatments are not significant. There is a small, non-significant advantage due to the potassic dressing.

3.—EXPERIMENT ON FISH MEAL.

A	A	B	B
B	B	A	A
I.	II.	III.	IV.

Soil: Heavy loam.
VARIETY: King Edward.
SYSTEM OF REPLICATION: 4 randomised blocks.
AREA OF EACH PLOT: 1/50th acre.
TREATMENT:
A=Sulphate of Ammonia and Superphosphate.
B=Sulphate of Ammonia and Fish Meal.
Rates: 0.5 cwt. N and 0.6 cwt. P_2O_5 per acre. All plots received Sulphate of Potash at the rate of 1.25 cwt. K_2O per acre.
Manures applied: April 3rd.
Potatoes planted: April 1st. Lifted: Oct. 1st.

Actual weights in lb.

Treatment.	I.	II.	III.	IV.
A	756	658	757	712
B	790	701	714	682

Summary of Results.

Average yield.	S./Ammonia Super.	S./Ammonia Fish Meal.	Mean.	Standard Error.
Tons per acre	16.09	16.11	16.10	0.346
Per cent.	99.9	100.1	100.0	2.15

No difference in yield.

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Sugar Beet: Effect of Nitrogenous Fertilisers, and of Muriate of Potash and Agricultural Salt.

Farm of Messrs. C. S. and G. M. Wilson, Colchester.

A			B		
7	9	8	2	7	5
4	1	5	4	9	6
6	2	3	1	3	8
5	2	8	4	9	7
4	6	9	8	5	1
7	1	3	3	2	6
C			**D**		

SYSTEM OF REPLICATION: 4 randomised blocks of 9 plots each.
AREA OF EACH PLOT: 1/60th acre.
TREATMENTS: Sulphate of Ammonia and Nitrate of Soda at the rate of 0.4 cwt. N per acre, Muriate of Potash at the rate of 0.8 cwt. K_2O per acre, and Salt equivalent in Chloride to Muriate of Potash, as shown in the Key to Treatments.
All plots received dung, and Superphosphate at the rate of 0.4 cwt. P_2O_5 per acre.
Soil: Light sandy gravel.
Manures applied: April 25th.
Seed sown: April 28th. Lifted: Nov. 6th-7th.
Variety: Kuhn P.

Key to Treatments.

Treatment.	1	2	3	4	5	6	7	8	9
Nitrogen ..				S/A	S/A	S/A	N/S	N/S	N/S
M/Potash		x	x		x	x		x	x
Salt ..			x			x			x

Actual weights in lb.

Treatments. N	Treatments. K	Roots (dirty). A	B	C	D	Tops. A	B	C	D
O	O	239	263	412	501	177	145	323	285
O	M/P	349	352	456	436	301	256	360	317
O	M/P & S	286	369	352	327	234	257	286	256
S/A	O	213	359	463	380	195	256	305	267
S/A	M/P	221	267	466	468	202	291	364	368
S/A	M/P & S	389	304	478	529	331	351	430	453
N/S	O	256	383	482	507	236	366	347	411
N/S	M/P	357	399	495	523	352	456	417	384
N/S	M/P & S	329	370	514	502	340	363	427	379

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Summary of Results.

Average yield in tons per acre.	Roots (washed).				Tops.				Average Sugar Percentage.			
	No Potash	Mur./ Pot.	M/Pot. & Salt.	Mean	No Potash	Mur./ Pot.	M/Pot. & Salt.	Mean	No Potash	Mur./ Pot.	M/Pot. & Salt.	Mean.
No Nitrogen ..	8.59	9.68	8.10	8.79	6.23	8.26	6.92	7.14	18.94	18.79	19.36	19.03
Sulph./Amm.	8.59	8.64	10.33	9.19	6.85	8.20	10.48	8.51	18.85	18.14	18.66	18.55
Nitrate of Soda	9.89	10.77	10.42	10.36	9.11	10.77	10.10	9.99	18.55	18.74	18.72	18.67
Mean	9.02	9.70	9.62	9.45	7.40	9.08	9.17	8.55	18.78	18.56	18.91	18.75
Standard Error	0.607				0.523				0.241			

Average yield per cent.	Roots (washed).				Tops.			
	No Potash	Muriate of Potash	M/Potash and Salt	Mean	No Potash	Muriate of Potash	M/Potash and Salt	Mean
No Nitrogen ..	91.0	102.4	85.8	93.1	72.9	96.7	80.9	83.5
Sulph./Amm. ..	91.0	91.5	109.3	97.3	80.1	96.0	122.6	99.6
Nitrate of Soda ..	104.7	114.1	110.3	109.7	106.5	126.1	118.2	116.9
Mean	95.6	102.7	101.8	100.0	86.5	106.3	107.2	100.0
Standard Error ..	6.43				6.12			

Significant response to sulphate of ammonia when applied to those plots having muriate of potash and salt. Nitrate of soda plots significantly superior to sulphate of ammonia plots except in the presence of muriate of potash and salt. The response to muriate of potash is only significant with tops; further response is produced by adding salt only on those plots having sulphate of ammonia. The application of nitrogenous dressing has lowered the sugar percentage significantly.

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Experiments at other centres, carried out by the local workers on the lines of those described on the preceding pages.

Potatoes. Mr. J. E. Arden, Owmby Cliff, Lincolnshire, 1930.

Latin Square: Plots 1/80th acre. Soil: Cliff (limestone).
Basal Manuring: 4 cwt. Sulphate of Ammonia and 3 cwt. Muriate of Potash per acre.
Variety: King Edward. Potatoes planted: April 17th. Lifted: Oct. 10th.

Average Yield.	No Super.	2 cwt. Super.	4 cwt. Super.	8 cwt. Super.	Mean.	Standard Error.
Tons per acre ..	11.37	12.19	11.85	12.34	11.94	0.169
Per cent. ..	95.2	102.1	99.3	103.4	100.0	1.41

Significant response to the first dressing of superphosphate. No further response to the higher dressings.

Potatoes. Midland Agricultural College, Loughborough, 1930.

Randomised blocks: Plots 1/48.4 acre. Soil: Light gravel.
Basal Manuring: 3 cwt. Sulphate of Ammonia and 3 cwt. Sulphate of Potash per acre.
Variety: King Edward. Potatoes planted: April 11th. Lifted: Sept. 19th. Previous Crop: Spring Oats.

Average Yield.	No Super.	2 cwt. Super.	4 cwt. Super.	8 cwt. Super.	Mean.	Standard Error.
Tons per acre ..	10.03	10.98	9.05	9.70	9.94	0.449
Per cent. ..	100.9	110.5	91.1	97.6	100.0	4.52

The yield has been significantly depressed by the heavier dressings (4 and 8 cwt.) of superphosphate.

Potatoes. County School, Welshpool, Montgomeryshire, 1930.

Randomised blocks: Plots 1/160th acre. Soil: School Garden.
Basal Manuring: 10 tons of F.Y.M. per acre, Sulphate of Ammonia at the rate of 0.8 cwt. N per acre, and Sulphate of Potash at the rate of 2 cwt. K_2O per acre.
Variety: Great Scott. Potatoes planted: May 7th. Lifted: Sept. 29th-Oct. 3rd.
Previous Crop: Sugar Beet.

Average Yield.	No Super.	2 cwt. Super.	4 cwt. Super.	8 cwt. Super.	Mean.	Standard Error.
Tons per acre ..	9.18	11.64	13.29	12.36	11.62	0.339
Per cent. ..	79.0	100.2	114.4	106.4	100.0	2.92

Significant responses to dressings of 2 and 4 cwt. of superphosphate. Slight set-back with the highest dressing, which, however, is not significant.

Potatoes. Mr. J. Clarke, Eskham House, Nateby, Lancashire, 1930.

Latin Square: Plots 1/62 acre. Soil: Moss soil on deep peat.
Basal Manuring: Dung at the rate of 12 tons per acre, 2 cwt. per acre Sulphate of Potash and 2 cwt. Sulphate of Ammonia per acre.
Variety: King Edward. Potatoes planted: May 1st. Lifted: Sept. 22nd.

Average Yield.	No Super.	2 cwt. Super.	4 cwt. Super.	8 cwt. Super.	Mean.	Standard Error.
Tons per acre ..	9.24	9.54	9.50	9.44	9.43	0.269
Per cent. ..	98.0	101.2	100.7	100.1	100.0	2.85

No response to superphosphate.

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Potatoes. Mr. George, Great Nash, Llangwm, 1930.

Latin Square: Plots 1/185th acre. Soil: Sandy-hungry.
Basal Manuring: 2 cwt. per acre Sulphate of Ammonia and 2 cwt. per acre Sulphate of Potash.
Variety: Kerr's Pink. Potatoes planted: May 2nd. Lifted: Jan. 5th, 1931.

Average Yield.	No Super.	2 cwt. Super.	4 cwt. Super.	8 cwt. Super.	Mean.	Standard Error.
Tons per acre ..	7.94	9.21	9.68	9.96	9.20	0.216
Per cent. ..	86.4	100.1	105.2	108.3	100.0	2.34

Significant response to superphosphate. The increment in yield falls off at the higher levels.

Potatoes. Grammar School, Burford, Oxon, 1930.

Latin Square: Plots 1/100th acre. Soil: Light loam on limestone.
TREATMENTS: Sulphate of Ammonia and Blood at the rate of 0.6 cwt. N per acre. Superphosphate and Bone Flour at the rate of 0.8 cwt. P_2O_5 per acre.
Basal Manuring: Sulphate of Potash at the rate of 1.4 cwt. K_2O per acre.
Variety: Kerr's Pink. Potatoes planted: April 10th. Lifted: Oct. 7th.

Average Yield.	Sulph/Amm. Bone Flour.	Dried Blood, Bone Flour.	Dried Blood, Super.	Sulph/Amm. Super.	Mean.	Standard Error.
Tons per acre ..	9.03	8.82	9.91	9.05	9.20	0.554
Per cent. ..	98.1	95.8	107.7	98.4	100.0	6.02

No significant differences between treatments.

Potatoes. Sailors' Orphan Homes School, Hull, 1930.

Latin Square: Plots 1/435 acre. Soil: Heavy Clay.
TREATMENTS: Sulphate of Ammonia at the rate of 0.4 cwt. N per acre, and Superphosphate at the rate of 0.5 cwt. P_2O_5 per acre.
Basal Manuring: Sulphate of Potash at the rate of 1 cwt. per acre K_2O.
Variety: Kerr's Pink. Potatoes planted: April 29th-30th. Lifted: Oct. 1st.

Average Yield.	Sulph/Amm. Super.	Sulph/Amm. Bone Flour.	Super Blood.	Bone Flour. Blood.	Mean.	Standard Error.
Tons per acre ..	11.69	9.86	10.88	9.01	10.36	0.425
Per cent. ..	112.9	95.2	105.0	87.0	100.0	4.10

Yield of plots receiving superphosphate significantly better than that of those receiving bone flour, irrespective of the source of nitrogen. The mean of all plots having sulphate of ammonia is significantly higher than that of those having nitrogen in the form of blood.

Sugar Beet. County School, Welshpool, Montgomeryshire, 1930.

Randomised blocks: Plots 1/160th acre. Soil: School Garden.
TREATMENTS: Sulphate of Ammonia, Cyanamide and Nitrate of Soda at the rate of 0.4 cwt. N per acre.
Basal Manuring: F.Y.M. at the rate of 10 tons per acre, Superphosphate at the rate of 0.8 cwt. P_2O_5 per acre and Muriate of Potash at the rate of 1 cwt. K_2O per acre.
Variety: Garton's Warrington. Beet sown: May 20th. Lifted: Oct. 28th-30th. Previous Crop: Mangolds and Swedes.

Average Yield.	No Nitrogen.	Nitrate of Soda.	Sulphate of Ammonia.	Cyanamide.	Mean.	Standard Error.
Roots (washed), tons per acre	11.59	12.57	13.32	11.96	12.36	0.135
Roots, per cent.	93.7	101.8	107.7	96.8	100.0	1.09
Tops, tons per acre	17.11	20.50	21.86	18.82	19.57	0.270
Tops, per cent.	87.4	104.7	111.7	96.2	100.0	1.38
Sugar percentage in roots ..	16.49	16.75	16.47	16.83	16.63	0.235

Significant responses to all forms of nitrogenous fertiliser. Sulphate of ammonia has proved significantly superior to nitrate of soda, while nitrate of soda in turn has produced a significantly higher yield than cyanamide. No significant differences in sugar percentage.

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Sugar Beet. South Eastern Agricultural College, Wye, Kent, 1930.

Latin Square: Plots 1/50th acre. Soil: Light chalk loam.
TREATMENTS: Sulphate of Ammonia with seed at the rate of 3 cwt. per acre, Nitrate of Soda, top dressed, at the rate of 444 lb. per acre and Calcium Cyanamide before drilling at the rate of 3 cwt. per acre.
Basal Manuring: Superphosphate at the rate of 4 cwt. per acre, and Muriate of Potash at the rate of 2 cwt. per acre.
Variety: Klein Wanzleben. Beet sown: May 8th. Lifted: Oct. 28th-30th.
Previous Crop: Sugar Beet.

Average Yield.	No Nitrogen.	Sulphate of Ammonia.	Nitrate of Soda.	Cyanamide.	Mean.	Standard Error.
Roots (washed) tons per acre..	10.61	12.44	12.72	12.65	12.11	0.187
Roots, per cent.	87.6	102.8	105.1	104.5	100.0	1.55
Tops, tons per acre	11.90	15.36	18.19	16.15	15.40	0.401
Tops, per cent.	77.3	99.7	118.1	104.9	100.0	2.60
Sugar percentage in roots ..	17.83	17.53	17.59	17.85	17.70	0.566

Significant responses to all forms of nitrogenous fertiliser. Nitrate of soda plots significantly better than the sulphate of ammonia and cyanamide plots in tops, but not in roots. No significant differences in sugar percentage.

Sugar Beet. South Eastern Agricultural College, Wye, Kent, 1930.

Latin Square: Plots 1/50th acre. Soil: Light chalk loam.
TREATMENTS: Muriate of Potash at the rate of 2 cwt. per acre and Salt (176 lb. per acre) providing equivalent Chlorine to Muriate of Potash.
Basal Manuring: Superphosphate at the rate of 4 cwt. per acre and Sulphate of Ammonia at the rate of 3 cwt. per acre.
Variety: Klein Wanzleben. Beet sown: May 8th. Lifted: Oct. 22nd-25th.
Previous Crop: Sugar Beet.

Average Yield.	Control.	Salt.	Muriate of Potash.	Muriate of Potash &Salt	Mean.	Standard Error.
Roots (washed) tons per acre..	12.58	13.02	13.29	13.27	13.04	0.137
Roots, per cent.	96.5	99.8	102.0	101.7	100.0	1.05
Sugar percentage in roots	16.42	16.66	16.80	16.60	16.62	0.128

Significant response to the potassic and salt dressings. No further response to the double dressing.

Sugar Beet. County Farm Institute, Moulton, Northampton, 1930.

Latin Square: Plots 1/50th acre. Soil: Sandy loam.
TREATMENTS: Muriate of Potash at the rate of 2 cwt. per acre and Salt (196 lb. per acre) providing equivalent Chlorine to Muriate.
Basal Manuring: Superphosphate at the rate of 2 cwt. per acre, Steamed Bone Flour at the rate of 1 cwt. per acre, 2 cwt. Sulphate of Ammonia per acre.
Variety: Klein Wanzleben E. Beet sown: May 2nd. Lifted: Oct. 22nd.

Average Yield.	Control.	Muriate of Potash.	Salt.	Muriate of Potash &Salt	Mean.	Standard Error.
Roots (washed) tons per acre..	10.08	11.76	11.85	11.54	11.31	0.483
Roots, per cent.	89.2	104.0	104.8	102.0	100.0	4.27
Tops, tons per acre	13.70	13.48	14.43	14.48	14.02	0.854
Tops, per cent...	97.7	96.1	102.9	103.2	100.0	6.09
Sugar percentage in roots ..	17.02	17.52	17.81	18.26	17.65	0.175

Significant response in roots to muriate of potash and salt applied separately, but no further response when they were applied together. With tops the small response to salt is insignificant. Muriate of potash and salt have significantly increased the sugar percentage in roots, while on the plots receiving both muriate of potash and salt the sugar percentage is significantly greater than on the plots receiving the dressings separately.

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Sugar Beet. The University of Leeds, Askham Bryan, Yorks, 1930.

Latin Square: Plots 1/20th acre. Soil: Light drift on Sandstone.
TREATMENTS: Nitrate of Soda with seed, Sulphate of Ammonia with seed and Nitrate of Soda as top dressing. Applications equivalent to 2 cwt. Sulphate of Ammonia per acre.
Variety: Johnson's Improved. Beet sown: May 3rd. Lifted: Oct. 29th-30th.
Previous Crop: Wheat.

Average Yield.	No Nitrogen.	N./Soda top dressing.	N./Soda with seed.	S/Ammonia with seed.	Mean.	Standard Error.
Roots (washed) tons per acre..	8.23	9.17	9.76	10.08	9.31	0.233
Roots, per cent.	88.4	98.5	104.8	108.3	100.0	2.50
Tops, tons per acre	9.48	10.94	11.59	11.62	10.90	0.221
Tops, per cent...	86.9	100.3	106.3	106.5	100.0	2.03
Sugar percentage in roots ..	18.01	18.26	18.02	17.89	18.05	0.215

Significant response to all forms of nitrogenous fertiliser with both roots and tops. Yield of plots having the dressing with the seed is significantly greater than that of plots having the top dressing. No difference between sulphate of ammonia and nitrate of soda when applied with seed. No significant differences in sugar percentage.

Barley. South Eastern Agricultural College, Wye, Kent, 1930.

Latin Square: Plots 1/50th acre. Soil: Light chalk loam.
TREATMENTS: Salt at the rate of 88 lb. per acre and Muriate of Potash at the rate of 1 cwt. per acre.
Basal Manuring: Superphosphate at the rate of 4 cwt. per acre and Sulphate of Ammonia at the rate of 1 cwt. per acre.
Variety: Plumage Archer. Barley sown: Mar. 4th. Harvested: Aug. 12th.
Previous Crop: Barley.

Average Yield.	No Salt or Potash.	Muriate of Potash.	Salt.	Muriate of Potash & Salt	Mean.	Standard Error.
Grain, cwt. per acre	19.4	20.0	20.2	20.3	20.0	0.77
Grain, per cent.	97.3	100.1	101.2	101.5	100.0	3.88
Straw, cwt. per acre	17.4	17.4	16.6	16.7	17.0	0.71
Straw, per cent.	102.1	102.1	97.5	98.2	100.0	4.16
Nitrogen percentage in grain..	1.33	1.31	1.30	1.30	1.31	0.009

No response to the potassic or salt fertilisers. Application of salt has depressed the nitrogen percentage significantly, while muriate of potash has been without effect.

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