

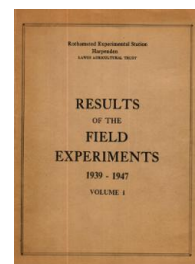
Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readable, or you suspect there are some problems, please let us know and we will correct that.



ROTHAMSTED
RESEARCH

Yields of the Field Experiments 1939-1947 Volume 1

[Full Table of Content](#)



BG/1 Market Garden - Sugar Beet, Barley

Rothamsted Research

Rothamsted Research (1948) *BG/1 Market Garden - Sugar Beet, Barley* ; Yields Of The Field Experiments 1939-1947 Volume 1, pp 157 - 168 - DOI: <https://doi.org/10.23637/ERADOC-1-145>

Bg/1.1

MARKET GARDEN EXPERIMENT

Woburn, Lansome Field (begun in 1942)

The use of heavy dressings of organic manures for making a market garden soil,
and the effect of sulphate of ammonia.

The four crops follow a two-year rotation, each of the two "series" into which the area is divided bearing two crops in a year, while the series carry different crops at any one season, except that in the first year the whole area was under winter cabbage.

System of replication: 2 series, each consisting of 4 randomized blocks of 10 plots each, certain interactions being partially confounded with block differences.

Area of each plot: 0.0125 acre. (In 1943, peas and beet 0.0105 acre)

Cropping:

1st year Globe beet (sown April, lifted July)
 Winter cabbage (transplanted August, cut December-March)

2nd year Peas (sown March-April, pulled June-July)
 Leeks (transplanted July, lifted January-March)

Treatments

Organic manures: Dung, sewage sludge compost (composted town refuse in 1942 and 1943), sewage sludge (West Middlesex) and vegetable compost, each at 15 and 30 tons per acre.

Organics were applied at 4 and 8 tons per acre to winter cabbage in the first year.

Sulphate of ammonia:

With organic manures: None, 0.6 cwt. N per acre
In absence of organics: None, 0.6, 1.2, 1.8 cwt. N per acre

Basal manuring:

Superphosphate, 0.4 cwt. P₂O₅ per acre (triple superphosphate in 1945 and 1946).

Muriate of potash, 0.5 cwt. K₂O per acre.

In 1943, 3200 lb. per acre carbonate of lime was applied to winter cabbage.

Time of application of manures:

Organic manures and basal dressings are given in a single dose in early spring before sowing peas and beet, except that in the first year the winter cabbage received a reduced dressing of organics and the full amount of basal manures. The sulphate of ammonia is divided between crops as follows (cwt. N per acre):

	With organics	In the absence of organics
Globe beet and peas	0, 0.2	0, 0.2, 0.4, 0.6
Cabbage and leeks	0, 0.4	0, 0.4, 0.8, 1.2

In the first year, the winter cabbage received the whole dressing of sulphate of ammonia.

Crop Notes

Winter Cabbage

Previous crop: Globe Beet (Cabbage in 1942)

Year	Series	Variety	Planted out	Harvested
1942	A	Christmas Cabbage	Aug. 13	Nov. 20 - Feb. 17
1943	B	January King	Sept. 2	Dec. 2 - March 16
1944	A	January King	Aug. 23	March 14, April 9
1945	B	January King	July 24 and Aug. 10	Dec. 1 - March 6
1946	A	Christmas Drumhead and Savoy	Aug. 12	Nov. 11 - 15
1947	B	Failed, owing to dry weather.		

Leeks (Cabbage in 1942)

Previous crop: Peas (Cabbage in 1942)

Year	Series	Variety	Planted out	Harvested
1942	B	January King ¹	Sept. 21	March 19
1943	A	Musselburgh	Aug. 6 - 20	March 6
1944	B	Musselburgh	July 18, 28	Feb. 22 - April 13
1945	A	Musselburgh	Aug. 7-14	March 5-12
1946	B	Musselburgh	Aug. 10, 30	May 15-20
1947	A	Musselburgh	July 18	Feb. 12-27

Globe Beet. Variety: Crimson Globe

Previous crop: Leeks (Cabbage in 1942)

Year	Series	Sown	Harvested
1943	B	April 27	July 19 - August 20
1944	A	April 16	July 24 - August 14
1945	B	April 20	July 5 - 30
1946	A	April 3	July 24 - August 6
1947	B	May 27	August 8 - 13

Peas. Variety: Kelvedon Wonder

Previous crop: Winter Cabbage

Year	Series	Sown	Harvested
1943	A	May 4 ²	July 12 - 14
1944	B	April 11	July 5 - 11
1945	A	April 4, 18	June 25 - July 17
1946	B	March 25, May 13 ³	July 6, 23 - 30
1947	A	April 25	June 26 - 30

- (1) No leek plants available
- (2) First sowing, April 10, failed
- (3) Two sowings, March 15 and April 20, failed

Market Garden Experiment

Bg/1.3

Globe Beet and Peas

	Organic Manures t.p.a.	Sulphate of Ammonia, cwt. N per acre								
		None	0.2	Mean	None	0.2	Mean	None	0.2	Mean
		Globe Beet Total produce ¹ : tons/acre			Globe Beet Bulbs ² : tons/acre			Peas Green peas: cwt./acre		
<u>1943</u>		(Series B)			(Series A)					
		±1.246			±0.881			±4.37		
	O	2.65	3.53	3.09	22.1	16.7	19.4			
	D 15	7.56	3.56	5.56	30.4	28.9	29.7			
	D 30	8.06	8.80	8.43	15.4	27.7	21.5			
	CTR 15	4.91	5.81	5.36	24.3	17.7	21.0			
	CTR 30	5.43	7.86	6.64	21.6	30.1	25.8			
	SS 15	5.29	5.11	5.20	20.1	28.3	24.2			
	SS 30	6.98	6.66	6.82	31.8	26.9	29.3			
	VC 15	5.46	6.92	6.19	15.4	23.8	19.6			
	VC 30	8.34	7.24	7.79	29.4	33.0	31.2			
	Mean	6.50 ³	6.49 ³	5.86 ⁴	23.5 ³	27.0 ³	24.0 ⁴			
	S.E. per plot	1.763 or 30.1%			6.18 or 25.8%					
<u>1944</u>		(Series A)			(Series B)					
		±0.775			±0.548			±2.61		
	O	1.33	1.10	1.21	11.2	7.1	9.1			
	D 15	4.15	4.26	4.21	9.3	8.0	8.7			
	D 30	3.07	5.77	4.42	8.3	14.2	11.2			
	CSS 15	2.71	1.51	2.11	10.6	9.9	10.2			
	CSS 30	1.96	5.01	3.48	10.4	11.2	10.8			
	SS 15	2.94	3.78	3.36	11.2	10.8	11.0			
	SS 30	4.90	4.13	4.52	7.3	8.9	8.1			
	VC 15	1.21	2.99	2.10	4.9	13.6	9.3			
	VC 30	4.68	5.76	5.22	9.8	11.5	10.6			
	Mean	3.20 ³	4.15 ³	3.22 ⁴	9.0 ³	11.0 ³	10.2 ⁴			
	S.E. per plot	1.09% or 33.0%			3.68 or 36.1%					

- (1) Excludes totally unmarketable produce and includes tops
- (3) Excludes "No organic manure".
- (4) Mean of all plots.

All standard errors have 17 d.f.

Symbols: O No organic manure CTR Composted town refuse
 D Dung CSS Composted sewage sludge
 SS Sewage sludge VC Vegetable compost

Bg/1.4

Globe Beet and Peas

Organic Manures t.p.a.	Sulphate of Ammonia, cwt. N per acre								
	None	0.2	Mean	None	0.2	Mean	None	0.2	Mean
	Globe Beet Total produce ¹ tons/acre			Globe Beet Bulbs ² tons/acre			Peas Green peas: cwt/acre		
<u>1945</u>	(Series B) ±0.748			(Series B) ±0.457			(Series A) ±7.79		
O	3.03	4.91	3.97	1.51	2.73	2.12	48.3	37.8	43.0
D 15	6.28	5.79	6.03	3.51	3.32	3.41	46.2	42.9	44.5
D 30	6.24	7.02	6.63	3.45	3.63	3.54	38.0	47.8	42.9
CSS 15	6.12	4.55	5.33	3.41	2.85	3.13	46.4	32.7	39.6
CSS 30	5.30	6.55	5.93	2.91	3.52	3.22	43.6	50.0	46.8
SS 15	5.40	5.95	5.68	2.87	3.29	3.08	41.8	49.9	45.8
SS 30	7.20	5.67	6.44	3.81	3.18	3.50	44.3	49.2	46.8
VC 15	5.80	5.13	5.46	3.25	3.16	3.21	46.5	38.7	42.6
VC 30	7.46	7.11	7.28	4.13	3.95	4.04	50.4	50.9	50.6
Mean	6.23 ³	5.97 ³	5.68 ⁴	3.42 ³	3.36 ³	3.15 ⁴	44.6 ³	45.2 ³	43.9 ⁴
S.E. per plot	1.058 or 18.6%			0.646 or 20.5%			11.02 or 25.1%		
<u>1946</u>				(Series A) ±0.648			(Series B) ±8.61		
O				0.51	0.88	0.69	20.2	37.6	28.9
D 15				2.32	2.77	2.55	35.5	31.6	33.6
D 30				4.01	3.64	3.82	40.2	36.6	38.4
CSS 15				0.97	1.44	1.21	38.6	36.8	37.7
CSS 30				1.95	1.63	1.79	33.6	18.2	25.9
SS 15				1.22	1.23	1.22	33.1	37.7	35.4
SS 30				1.32	2.32	1.82	36.6	30.2	33.4
VC 15				1.31	1.55	1.43	54.0	40.1	47.0
VC 30				3.01	2.90	2.96	32.1	30.4	31.2
Mean				2.01 ³	2.18 ³	1.84 ⁴	33.0 ³	32.7 ³	33.7 ⁴
S.E. per plot				0.916 or 49.7%			12.18 or 36.1%		

- (1) Excludes totally unmarketable produce and includes tops.
In 1946 many plants went to seed.
- (2) Excludes unmarketable produce.
- (3) Excludes "No organic manure".
- (4) Mean of all plots.

All standard errors have 17 d.f.

Symbols: O No organic manure CSS Composted sewage sludge
 D Dung SS Sewage sludge
 VC Vegetable compost

Market Garden Experiment

Bg/1.5

Globe Beet and Peas

Organic Manures t.p.a.	Sulphate of Ammonia, cwt. N per acre								
	None	0.2	Mean	None	0.2	Mean	None	0.2	Mean
	Globe Beet Total produce ¹ : tons/acre			Globe Beet Bulbs ² : tons/acre			Peas Green peas cwt/acre		
<u>1947</u>	(Series B)			(Series B)			(Series A)		
	±0.520		±0.368	±0.310		±0.219	±2.71		±1.92
O	1.43	0.86	1.14	0.87	0.46	0.66	22.3	17.1	19.7
D 15	3.35	2.90	3.12	1.57	1.52	1.54	27.4	25.7	26.6
D 30	5.52	5.25	5.39	3.02	3.04	3.03	26.9	27.0	26.9
CSS 15	1.67	2.63	2.15	0.97	1.38	1.18	28.6	25.8	27.2
CSS 30	3.41	2.53	2.97	1.91	1.24	1.57	26.4	23.4	24.9
SS 15	0.92	1.12	1.02	0.54	0.63	0.58	25.6	21.0	23.3
SS 30	0.60	1.12	0.86	0.20	0.62	0.41	25.0	27.0	26.0
VC 15	2.61	3.18	2.90	1.51	1.74	1.63	23.2	17.9	20.5
VC 30	3.19	3.23	3.21	1.87	1.75	1.81	27.8	26.2	27.0
Mean	2.66 ³	2.74 ³	2.34 ⁴	1.45 ³	1.49 ³	1.28 ⁴	26.4 ³	24.2 ³	24.3 ⁴
S. E. per plot	0.736 or 31.4%			0.438 or 34.2%			3.83 or 15.8%		

- (1) Excludes totally unmarketable produce and includes tops.
- (2) Excludes unmarketable produce
- (3) Excludes "No organic manure"
- (4) Mean of all plots

All standard errors have 17 d.f.

Yields on plots without organic Manure
Sulphate of Ammonia, cwt.N per acre

	None	0.2	0.4	0.6	S. E.
Globe Beet					
Total produce: tons per acre					
1943	2.65	3.53	2.78	4.16	±1.246
1944	1.33	1.10	1.89	3.25	±0.775
1945	3.03	4.91	3.70	4.35	±0.748
1947	1.43	0.86	0.48	0.89	±0.520
Bulbs: tons per acre					
1945	1.51	2.73	2.17	2.31	±0.457
1946	0.51	0.88	1.35	0.51	±0.648
1947	0.87	0.46	0.29	0.47	±0.310
Peas					
Green peas: cwt. per acre					
1943	22.1	16.7	16.7	19.9	±4.37
1944	11.2	7.1	10.1	16.2	±2.61
1945	48.3	37.8	39.6	33.4	±7.79
1946	20.2	37.6	28.4	23.0	±8.61
1947	22.3	17.1	20.4	21.4	±2.71

Winter Cabbage

		Sulphate of Ammonia, cwt. N per acre								
		None	0.6	Mean	None	0.6	Mean	None	0.6	Mean
Organic	Manares t.p.a. ¹	Total produce: tons/acre			Plant number thousands per acre			Total produce tons/acre		
1942		(Series A)			(Series A)			(Series B)		
		±1.046			±0.740			±0.300		
		±0.740			±0.82			±0.58		
O		5.27	7.68	6.48 _b	17.5	18.2	17.9 _d	1.30	2.51	1.91 _f
D	4	5.96 ^a	7.91 ^a	6.94 _b	17.6 ^c	18.5 ^c	18.0 ^d	2.33 ^e	2.19 ^e	2.26 _f
n	8	7.63 ^a	8.90 ^a	8.27 _b	18.1 ^c	18.4 ^c	18.3 ^d	2.30 ^e	2.66 ^e	2.48 _f
CTR	4	7.66	7.15	7.40	18.3	18.6	18.4	2.16	2.39	2.27
CTR	8	7.43	9.79	8.61	18.2	19.4	18.8	2.16	2.29	2.22
SS	4	8.75	9.60	9.18	18.8	19.1	19.0	2.14	2.43	2.28
SS	8	8.55	7.48	8.02	16.7	17.2	17.0	1.99	2.50	2.24
Mean		7.45 ²	8.46 ²	7.69 ³	17.9 ²	18.5 ²	18.2 ³	2.21 ²	2.41 ²	2.23 ³
S.E. per plot		1.479 or 19.2%			1.16 or 6.4%			0.424 or 19.0%		

Standard errors for D figures only: (a) 0.740 (b) 0.523 (c) 0.58 (d) 0.41 (e) 0.212 (f) 0.150

(1) Since there was no crop of globe beet and peas, organics and all the Sulphate of Ammonia (0.6 cwt. N per acre) were applied to the cabbages. No vegetable compost was available: instead dung was applied, so that the number of dunged plots was twice that in subsequent years.

(2) Excludes "No organic manure".

(3) Mean of all plots.

All standard errors have 17 d.f.

Symbols: O No organic manure. SS Sewage sludge
 D Dung VC Vegetable compost
 CTR Composted town refuse

Market Garden Experiment

Winter Cabbage and Leeks

Organic Manures t. p. a.	Sulphate of Ammonia, cwt. N per acre			Winter Cabbage (Series B)			Leeks (Series A)		
	None	O. 4	Mean	Total produce: tons/acre	Plant number: thous./acre	Mean	Total produce: tons/acre	Plant number: thous./acre	Mean
	±0.336	±0.238	±0.47	±0.67	±0.47	±0.270	±0.191	±0.99	±0.70
1943	1.26	2.10	15.2	16.6	15.9	1.23	1.96	41.9	43.7
0	2.86	3.05	16.3	17.3	16.8	1.25	1.86	44.6	44.4
D	3.12	3.58	17.0	16.1	16.6	2.40	2.00	45.0	44.6
CTR	2.73	2.81	17.4	15.9	16.7	1.57	1.46	43.6	44.5
CTR	2.01	2.58	13.6	17.4	15.5	0.96	1.65	41.3	41.9
SS	2.81	3.07	16.2	17.1	16.6	1.92	1.92	44.4	44.5
SS	3.61	3.32	16.7	17.3	17.0	1.50	1.38	43.7	43.4
VC	3.09	3.18	17.6	16.0	16.8	2.04	1.82	45.5	44.4
VC	3.57	3.54	17.1	17.8	17.4	1.57	2.07	43.5	44.1
Mean	2.98 ²	3.00 ³	16.5 ²	16.9 ²	16.6 ³	1.65 ²	1.77 ²	44.0 ²	43.9 ³
S.E. per plot	0.475 or 15.8%	0.95 or 5.7%	0.382 or 22.4%			1.41 or 3.2%			

(2) Excludes "No organic manure"

(3) Mean of all plots.

(4) Organics applied to previous crop of globe beet and peas.

All standard errors have 17 d.f.

Symbols: O No organic manure. SS Sewage sludge. CTR Composted town refuse.
 D Dung. VC Vegetable compost.

Winter Cabbage and Leeks

Organic Manures t. p. a.	Sulphate of Ammonia, cwt. N per acre			Winter Cabbage (Series A)			Leeks (Series B)				
	None	0.4	Mean	None	0.4	Mean	None	0.4	Mean		
	Total produce: tons/acre			Plant number: thous./acre			Total produce: tons/acre			Plant number: thous./acre	
1944	±0.417	±0.295	±0.54	±0.76	±0.54	±0.479	±0.339	±3.34	±2.36		
0	0.49	1.00	15.0	13.7	16.3	1.54	1.24	27.1	28.0		
D	1.17	3.41	17.3	16.0	18.6	2.39	1.98	34.8	33.0		
D	1.53	3.92	17.4	16.9	17.9	3.34	3.39	35.8	36.0		
CSS	0.68	1.98	16.6	15.2	18.0	1.50	2.01	29.2	31.9		
CSS	0.78	2.08	15.0	14.0	16.0	1.71	1.47	28.7	27.4		
SS	2.17	4.09	15.8	14.9	16.8	1.59	1.30	31.7	29.9		
SS	4.27	4.32	16.4	15.9	17.0	0.77	1.23	29.1	28.0		
VC	0.91	2.28	17.0	17.0	17.0	1.67	1.82	32.1	32.4		
VC	1.17	2.88	15.9	14.8	17.0	3.21	2.95	35.2	35.6		
Mean	1.59 ²	3.12 ²	16.3 ³	15.6 ²	17.3 ²	2.02 ²	1.89 ³	32.1 ²	31.4 ²		
S. E. per plot	0.589	or 25.8%	1.07	or 6.6%		0.678	or 35.8%	4.73	or 15.2%		

(1) Organics applied to previous crop of globe beet and peas.

(2) Excludes "No organic manure".

(3) Mean of all plots.

All standard errors have 17 d. f.

Symbols: O No organic manure. SS Sewage sludge. CSS Composted sewage sludge
 D Dung VC Vegetable compost.

Market Garden Experiment

Bg/1.9

Winter Cabbage and Leeks

Organic Manures t. p. a.	Sulphate of Ammonia, cwt. N per acre			Winter Cabbage (Series B)			Leeks (Series A)		
	None	0.4	Mean	Total produce: tons/acre	Plant number: thous./acre	Mean	Total produce: tons/acre	Plant number: thous./acre	Mean
1945									
0	±0.956	±1.00	±0.676	±0.71		±0.151	±2.48		±1.75
D	4.26	16.5	5.47	16.6	1.17	1.20	47.6	41.6	44.6
D	7.82	19.2	7.58	18.4	1.73	1.33	44.8	41.7	43.2
CSS	6.97	17.5	7.25	16.8	1.80	1.26	42.5	38.4	40.4
CSS	5.85	17.6	6.40	17.5	1.43	1.09	43.7	42.6	43.2
SS	6.77	18.2	8.04	17.8	1.25	1.13	41.1	35.5	38.3
SS	6.74	16.5	7.14	16.2	1.07	0.88	38.1	33.9	36.0
VC	8.57	17.5	8.76	17.5	1.49	1.25	39.6	35.4	37.5
VC	6.01	16.9	6.62	17.1	1.39	1.31	45.4	41.8	43.6
VC	7.97	17.3	8.47	17.4	1.97	1.47	43.1	36.8	40.0
Mean	7.09 ²	17.6 ²	7.42 ³	17.3 ³	1.52 ²	1.21 ²	42.3 ²	38.3 ²	40.9 ³
S. F. per plot	1.352 or 18.4%	1.42 or 8.2%			0.301 or 22.6%		3.50 or 8.6%		

(1) Organics applied to previous crop of globe beet and peas.

(2) Excludes "No organic manure".

(3) Mean of all plots

All standard errors have 17 d.f.

Symbols: O No organic manure. SS Sewage sludge. CSS Composted sewage sludge.
 D Dung. VC Vegetable compost.

Winter Cabbage and Leeks

Organic Manures t.p.a.	Winter Cabbage (Series A)			Leeks (Series B)		
	None	0.4	Mean	None	0.4	Mean
1946	Total produce: tons/acre			Total produce: tons/acre		
0	±0.404	±0.286	±0.32	±0.391	±0.276	±1.17
D	1.45	1.86	17.5	1.91	2.01	42.6
D	2.38	3.19	17.3	2.75	2.74	40.6
CSS	2.56	3.69	17.8	3.76	3.82	43.6
CSS	1.47	2.60	17.1	2.42	2.74	39.9
SS	2.06	2.80	18.0	3.06	3.82	42.8
SS	2.62	3.56	17.3	2.27	2.73	42.4
VC	4.47	5.23	17.5	2.82	2.82	40.0
VC	1.17	1.99	17.5	4.09	3.90	44.1
VC	2.25	2.58	17.8	2.61	3.10	43.7
Mean	2.37 ²	3.10 ³	17.4 ²	3.42	2.94 ³	42.2 ²
S.E. per plot	4.04 ²	17.7 ²	0.45 or 2.6%	3.02 ²	2.94 ³	42.3 ²
	0.572 or 18.5%	0.45 or 2.6%		0.553 or 18.8%		1.66 or 3.9%

(1) Organics applied to previous crop of globe beet and peas.

(2) Excludes "No organic manure".

(3) Mean of all plots.

All standard errors have 17 d.f.

Symbols: 0 No organic manure. SS Sewage sludge. CSS Composted sewage sludge.
 D Dung VC Vegetable compost.

Bg/1.12

Yields on plots without organic manure

	Sulphate of Ammonia, cwt. N per acre					Sulphate of Ammonia, cwt. N per acre				
	None	0.4	0.8	1.2	S.E.	None	0.4	0.8	1.2	S.E.
	Total produce: tons per acre					Plant number: thous. per acre				
1942 ⁴	Winter Cabbage									
Series A	5.27	7.68	8.37	5.33	±1.046	17.5	18.2	19.4	17.1	±0.82
Series B	1.30	2.51	2.16	1.70	±0.300	No figures available				
1943	1.26	2.94	3.03	2.57	±0.336	15.2	16.6	16.9	16.1	±0.67
1944	0.49	1.51	3.38	2.62	±0.417	13.7	16.3	17.8	15.7	±0.76
1945	4.26	6.67	6.88	8.33	±0.956	16.5	16.8	16.7	18.4	±1.00
1946	1.45	2.27	2.75	4.23	±0.404	17.5	17.9	17.9	17.6	±0.32
	Leeks									
1943	1.23	1.96	1.90	1.56	±0.270	41.9	43.7	44.2	44.0	±0.99
1944	1.54	0.94	1.17	1.93	±0.479	27.1	29.0	28.1	31.0	±3.34
1945	1.17	1.20	1.21	1.17	±0.213	47.6	41.6	41.8	42.5	±2.48
1946	1.91	2.10	2.01	2.69	±0.391	42.6	40.6	46.4	43.1	±1.17
1947	1.68	1.82	1.85	1.24	±0.197	42.5	42.6	42.0	41.8	±0.80

(4) The dressings of nitrogen in 1942 were None, 0.6, 1.2, 1.8 cwt. per acre, since no globe beet or peas were grown.

All standard errors have 17 d.f.