

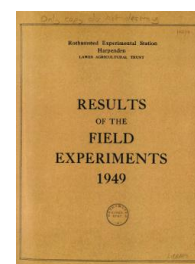
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Yields of the Field Experiments 1949

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49/BB/1 Six Course Rotation - Deep Cultivation

49/BB/1 Six Course Rotation - Deep Cultivation , Rothamsted Research (1950) Yields Of The Field Experiments 1949, pp 31 - 38

49/Bb/1.1

DEEP CULTIVATION ROTATION EXPERIMENT

Long Hoos I and III, 1949

Effects of deep ploughing, and of ploughing in mineral fertilizers and dung at different depths.

Rotation treatments and basal manuring as given in Results of Field Experiments, 48/Bb/1.

Area of each plot: 0.03125 acre. Areas harvested: wheat, spring oats, barley, 0.02652 acre; ley, 0.2750 acre; sugar beet, (half plot) 0.01186 acre; potatoes, (half plot), 0.01068 acre.

Cultivations, etc:

Wheat. Series 1.

Ploughed deep: Aug 3. Ploughed shallow: Aug 6. Cultivated (deep plots twice, shallow plots once): Sept 13. Rolled and cultivated: Sept 22. Ploughed: Sept 29, 30. Harrowed: Oct 22. Seed drilled and harrowed in: Oct 28. Harrowed and rolled: Apr 11. Sulphate of ammonia applied: Apr 26. Harvested July 28. Variety: Bersee. Previous crop: Ley.

Spring oats. Series 2.

Ploughed: Oct 4, 5. Springtined: Feb 18. Ploughed: Feb 23-25. Harrowed twice: Feb 25, 26. Sulphate of ammonia applied, springtined: Feb 28. Seed drilled and harrowed in: Mar 11. Ring rolled: Apr 13. Harvested: July 29. Variety: Star. Previous crop: Potatoes.

Sugar beet. Series 3.

Dung and artificials applied to deep ploughing plots, ploughed deep: Sept 20. Dung and artificials applied to shallow ploughing plots: Sept 21. Ploughed shallow (about 6 inches): Sept 22. Ploughed: Jan 18. Cultivated: Mar 29. Harrowed: Apr 1. Ring rolled: Apr 2. Artificials applied: Apr 9. Harrowed and rolled: Apr 11. Seed drilled: Apr 12. Harrowed in and rolled: Apr 13. Hoed at intervals: May 16 - June 27. Singled: May 25-27. Lifted: Nov 15. Variety: Klein E. Previous crop: Spring oats.

Barley. Series 4.

Ploughed: Jan 20. Springtined: Feb 26. Sulphate of ammonia and slag applied: Feb 28. Seed drilled and harrowed in: Mar 11. Ring rolled: Apr 13. Seeds mixture undersown, harrowed and rolled: Apr 14. Harvested: July 29. Variety: Plumage Archer. Previous crop: Sugar beet.

Ley. Series 5.

Seeds undersown in barley: Apr 15, 1948. Harrowed and ring rolled: Apr 16. Rolled: Mar 23, 1949. Cut: June 13. Seeds mixture per acre: 18 lb ryegrass (S 24), 8 lb. English late flowering red clover (Montgomery), 2 lb. American Alsike-clover. Previous crop: Barley.

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Potatoes. Series 6.

Dung and artificials applied and ploughed in deep: Sept 20. Dung and artificials applied to shallow plots: Sept 21. Ploughed in shallow: Sept 22. Ploughed: Jan 19. Cultivated: Mar 29. Harrowed, ring rolled, ridged: Mar 31. Artificials applied: Apr 2. Potatoes planted and covered in: Apr 4. Ridges rolled down: Apr 9. Chain harrowed: Apr 27. Re-ridged: May 9. Harrowed ridges: May 16. Hoed: June 28. Grubbed: June 29. Earthed up: July 11. Sprayed to kill off haulm: Sept 8. Lifted: Sept 19. Variety: Majestic. Previous crop: Wheat.

Standard errors per plot:

Wheat. Grain, 2.50 cwt per acre or 5.7% (4 d.f.)

Spring oats. Grain, 2.17 cwt per acre or 5.7% (4 d.f.)

Sugar beet. Total sugar, whole plot, 8.13 cwt per acre or 11.8% (4 d.f.)
sub-plot, 2.48 cwt per acre or 9.5% (7 d.f.)
Tons, whole plot, 1.155 tons per acre or 1.5% (4 d.f.)
sub-plot, 0.37 tons per acre or 0.5% (7 d.f.)

sub-plot, 2.48 cwt per acre or 9.5% (7 d.f.)

Tops, whole plot, 1.155 tons per acre or 16.0% (4 d.f.)
sub-plot, 0.521 tons per acre or 7.3% (4 d.f.)

sub-plot, 0.521 tons per acre or 7.2% (7 d.f.)

Barley. Grain, 1.10 cwt per acre or 3.3% (4.d.f.)

Ley.	2.25 cwt per acre or	3.4% (4 d.f.)
Potatoes		

Potatoes. Ware, whole plot, 0.449 tons per acre or 7.8% (4 d.f.)
sub-plot 0.336

sub-plot, 0.736 tons per acre or 12.9% (7 d.f.)

49/Bb/1.3

Series I. Wheat

Residual effects of treatments applied to sugar beet in 1946

	Mean	Responses to treatments							
		Floughing		Dung		Super		Potash	
		Shallow	Deep	Abs.	Fres.	Abs.	Fres.	Abs.	Fres.
Grain: Mean yield 43.8 cwt per acre									
	(± 1.25)	(1.77)							
Floughing deep	1.2	-	-	1.1	1.3	-0.5	2.9	2.3	0.1
- shallow	1.6	1.5	1.7	-	-	1.2	2.0	-0.4	3.6
Dung	0.9	-0.8	2.6	0.5	1.3	-	-	1.9	-0.1
Superphosphate	0.7	1.8	-0.4	-1.3	2.7	1.7	-0.3	-	-
Potash									
Straw: Mean yield 63.5 cwt per acre									
Floughing deep	1.3	-	-	0.6	2.0	-1.6	4.2	2.2	0.4
- shallow	3.9	3.2	4.6	-	-	2.3	5.5	0.6	7.2
Dung	0.3	-2.6	3.2	-1.3	1.9	-	-	1.9	-1.3
Superphosphate	3.5	4.4	2.6	0.2	6.8	5.1	1.9	-	-
Potash									

Series 2. Spring oats

Residual effects of treatments applied to potatoes in 1948

	Mean	Responses to treatments							
		Floughing		Dung		Super		Potash	
		Shallow	Deep	Abs.	Fres.	Abs.	Fres.	Abs.	Fres.
Grain: Mean yield 38.0 cwt per acre									
	(± 1.09)	(1.54)							
Floughing deep	-0.6	-	-	-1.1	-0.1	-0.7	-0.5	-0.9	-0.3
- shallow	2.3	1.8	2.8	-	-	1.5	3.1	2.8	1.8
Dung	-1.1	-1.2	-1.0	-1.9	-0.3	-	-	-1.4	-0.8
Superphosphate	1.1	0.8	1.4	1.6	0.6	0.8	1.4	-	-
Potash									
Straw: Mean yield 50.0 cwt per acre									
Floughing deep	-1.6	-	-	0.2	-3.4	-2.7	-0.5	-1.1	-2.1
- shallow	8.3	10.1	6.5	-	-	7.9	8.7	8.4	8.2
Dung	-2.0	-3.1	-0.9	-2.4	-1.6	-	-	-2.3	-1.7
Superphosphate	2.6	3.1	2.1	2.7	2.5	2.3	2.9	-	-
Potash									

49/Bb/1.4

Series 3. Sugar Beet

	Responses to treatments							
	Mean	Ploughing		Dung		Super		Potash
		Shallow	Deep	Abs.	Fres.	Abs.	Fres.	Abs. Fres.
Total sugar: Mean yield 26.0 cwt per acre								
	(± 1.53)	(± 2.16)						
Ploughing deep								
-shallow	1.6	-	-	3.0	0.2	0.2	3.0	0.9 2.3
Dung	6.8	6.2	5.4	-	-	7.0	6.6	6.6 7.0
Superphosphate	-0.9	-2.3	0.5	-0.7	-1.1	-	-	-0.7 -1.1
Potash	-0.1	-0.8	0.6	-0.3	0.1	0.1	-0.3	- -

Roots (washed): Mean yield 8.93 tons per acre

Ploughing deep								
-shallow	0.64	-	-	1.06	0.20	0.34	0.94	0.40 0.88
Dung	2.20	2.64	1.76	-	-	2.30	2.10	2.20 2.20
Superphosphate	-0.37	-0.67	-0.07	-0.27	-0.47	-	-	-0.14 -0.60
Potash	0.02	-0.22	0.26	0.02	0.02	0.25	-0.21	- -

Sugar Percentage: Mean 14.54

Ploughing deep								
-shallow	-0.06	-	-	0.00	-0.12	-0.36	0.24	-0.08 -0.04
Dung	0.17	0.23	0.11	-	-	0.15	0.19	0.02 0.32
Superphosphate	0.09	-0.21	0.39	0.07	0.11	-	-	-0.14 0.32
Potash	-0.11	-0.13	-0.09	-0.26	0.04	-0.34	0.12	- -

Tops: Mean yield 7.21 tons per acre

(± 0.577) (± 0.817)

Ploughing deep								
-shallow	0.04	-	-	0.65	-0.57	-0.20	0.28	0.06 0.02
Dung	1.02	1.63	0.41	-	-	0.95	1.09	0.61 1.23
Superphosphate	0.02	-0.22	0.26	-0.05	0.09	-	-	0.44 -0.40
Potash	-0.05	-0.03	-0.07	-0.26	0.16	0.37	-0.47	- -

Plant Number: Mean 22.9 thousands per acre

Ploughing deep								
-shallow	1.4	-	-	1.3	1.3	1.3	1.5	1.5 1.3
Dung	0.9	0.8	1.0	-	-	2.0	-0.2	0.3 1.5
Superphosphate	-0.7	-0.8	-0.6	0.4	-1.8	-	-	0.2 -1.6
Potash	-0.7	-0.6	-0.8	-1.3	-0.1	0.2	-1.6	- -

Noxious Nitrogen: Mean 62.5

Ploughing deep								
-shallow	-1.2	-	-	1.3	-3.7	0.0	-2.4	-1.8 -0.6
Dung	-1.2	1.3	-3.7	-	-	-1.2	-1.2	-1.8 -0.6
Superphosphate	0.0	1.2	-1.2	0.0	0.0	-	-	3.1 -3.1
Potash	1.1	2.8	5.0	2.8	5.0	2.5	2.2	- -

49/Bb/1.5

Series 3. Sugar Beet

	Superphosphate				Potash			
	None	Ploughed In seed in bed		None	Ploughed In seed in bed			Mean
Total sugar: cwt per acre								
	(a)	(b) and (c)		(a)	(b) and (c)			
Shallow	26.3	23.4	24.7	25.6	24.9	24.6	25.2	
Deep	26.6	27.9	26.2	26.5	27.1	27.2	26.8	
No dung	23.0	22.7	21.9	22.8	22.7	22.2	22.6	
Dung	30.0	28.6	29.0	29.4	29.2	29.6	29.4	
Mean	26.5	25.7	25.5	26.1	26.0	25.9	26.0	
Roots (washed): tons per acre								
Shallow	8.95	8.08	8.47	8.73	8.58	8.42	8.61	
Deep	9.29	9.65	8.78	9.12	9.44	9.32	9.25	
No dung	7.97	7.92	7.47	7.82	8.03	7.66	7.83	
Dung	10.27	9.81	9.78	10.03	9.99	10.09	10.07	
Mean	9.12	8.87	8.62	8.93	9.01	8.87	8.93	
Sugar Percentage								
Shallow	14.67	14.41	14.52	14.63	14.47	14.54	14.57	
Deep	14.32	14.47	14.93	14.56	14.33	14.60	14.51	
No dung	14.42	14.30	14.68	14.58	14.17	14.48	14.45	
Dung	14.56	14.59	14.78	14.60	14.63	14.65	14.62	
Mean	14.49	14.44	14.72	14.59	14.40	14.56	14.54	
Tops: tons per acre								
	(a)	(b) and (c)		(a)	(b) and (c)			
Shallow	7.30	7.00	7.16	7.21	7.25	7.09	7.19	
Deep	7.10	7.64	7.06	7.26	7.17	7.22	7.23	
No dung	6.72	6.84	6.51	6.63	6.60	6.54	6.70	
Dung	7.68	7.80	7.73	7.64	7.83	7.77	7.72	
Mean	7.20	7.32	7.12	7.24	7.21	7.16	7.21	

Standard errors	Total Sugar	(a)	(b)	(c)
		±1.53	±1.24	±1.76
Standard errors	Tops	±0.577	±0.261	±0.606

Standard errors (b) for use in horizontal comparisons only (a) and (c)
for use in all other comparisons

49/Bb/1.6

Series 3. Sugar Beet

	None	Superphosphate Ploughed In seed in bed	None	Potash Ploughed in	In seed bed	Mean
Plant Number: thousands per acre						
Shallow	22.6	20.7	22.9	22.5	21.7	22.2
Deep	23.9	23.9	22.5	23.9	23.8	23.5
No dung	22.3	22.7	22.5	23.1	22.3	22.4
Dung	24.2	21.9	22.9	23.4	23.2	23.3
Mean	23.2	22.3	22.7	23.2	22.8	22.9

Noxious Nitrogen

Shallow	62.5	65.0	62.5	61.2	65.0	65.0	63.1
Deep	62.5	62.5	60.0	59.4	65.0	63.8	61.9
No dung	63.1	65.0	61.2	61.2	65.0	65.0	63.1
Dung	61.9	62.5	61.2	59.4	65.0	63.8	61.9
Mean	62.5	63.8	61.2	60.3	65.0	64.4	62.5

Series 4. Barley

Residual effects of treatments applied to sugar beet in 1948

	Responses to treatments							
	Mean	Ploughing Shallow	Deep	Dung Abs. Pres.	Super. Abs. Pres.	Potash Abs. Pres.		

Grain: Mean yield 33.7 cwt per acre

(± 0.55)(± 0.78)

Ploughing deep								
-shallow	0.9	-	-	0.8	1.0	1.0	0.8	0.6 1.0
Dung	1.5	1.4	1.6	-	-	1.2	1.8	1.9 1.1
Superphosphate	0.8	0.9	0.7	0.5	1.1	-	-	0.7 0.9
Potash	1.5	1.4	1.6	1.9	1.1	1.4	1.6	- -

Straw: Mean yield 33.8 cwt per acre

Ploughing deep								
-shallow	1.9	-	-	1.9	1.9	1.7	2.1	2.4 1.4
Dung	2.7	2.7	2.7	-	-	1.6	3.8	3.1 2.3
Superphosphate	1.0	0.8	1.2	-0.1	2.1	-	-	0.9 1.1
Potash	1.4	1.9	0.9	1.8	1.0	1.3	1.5	- -

Series 5. Ley

49/Bb/1.7

Residual effects of treatments applied to sugar beet in 1947

	Mean	Responses to treatments							
		Ploughing		Dung		Super		Potash	
		Shallow	Deep	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.
Hay: Mean yield 65.8 cwt per acre									
	(± 1.13)								
Ploughing deep	1.5	-	-	3.0	0.0	0.3	2.7	-0.1	3.1
- shallow	4.1	5.6	2.6	-	-	4.9	3.3	4.8	3.4
Dung	1.1	-0.1	2.3	1.9	0.3	-	-	1.6	0.6
Superphosphate	0.6	-1.0	2.2	1.3	-0.1	1.1	0.1	-	-
Potash									

Series 6. Potatoes

	Responses to treatments									
	Mean	Ploughing		Dung		Super		Potash		
		Shallow	Deep	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.	
Ware tubers: Mean yield 5.72 tons per acre										
	(± 0.224)									
Ploughing deep	-0.05	-	-	0.31	-0.41	0.11	-0.21	-0.23	0.13	
- shallow	2.36	2.72	2.00	-	-	2.22	2.50	3.17	1.55	
Dung	0.38	0.54	0.22	0.24	0.52	-	-	0.34	0.42	
Superphosphate	0.97	0.79	1.15	1.78	0.16	0.93	1.01	-	-	
Potash										
Percentage ware: Mean 94.2										
Ploughing deep	1.5	-	-	1.3	1.7	1.9	1.1	2.1	0.9	
- shallow	0.2	0.0	0.4	-	-	-0.1	0.5	1.5	-1.1	
Dung	-0.6	-0.4	-1.2	-1.1	-0.5	-	-	-0.3	-1.3	
Superphosphate	1.0	1.6	0.4	2.3	-0.3	1.5	0.5	-	-	
Potash										

49/Bb/1.8

Series 6. Potatoes

	None	Superphosphate Floughed in	In ridges	None	Potash Floughed in	In ridges	Mean
Ware tubers: tons per acre							
	(a)	(b)	(c)	(a)	(b)	(c)	
Shallow	5.48	6.25	5.73	5.35	6.41	5.86	5.75
Deep	5.58	5.44	6.16	5.12	5.80	6.74	5.70
No dung	4.42	4.92	4.40	3.65	5.41	5.45	4.54
Dung	6.64	6.76	7.55	6.82	6.81	7.15	6.90
Mean	5.53	5.84	5.93	5.24	6.11	6.30	5.72

Percentage ware

Shallow	93.7	93.4	93.2	92.6	94.3	94.3	93.5
Deep	95.6	94.5	94.2	94.8	94.9	95.4	95.0
No dung	94.6	94.0	93.2	93.0	95.2	95.2	94.1
Dung	94.6	94.0	94.2	94.4	94.0	94.5	94.3
Mean	94.6	94.0	93.7	93.7	94.6	94.9	94.2

Standard errors (a) ± 0.224 (b) ± 0.366 (c) ± 0.344

Standard error (b) for use in horizontal comparisons only; standard errors (a) and (c) for use in all other comparisons.