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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.

49/Bb/1.2

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.)
 Tops, whole plot, 1.155 tons per acre or 16.0% (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. Ware, whole plot, 0.449 tons per acre or 7.8% (4 d.f.)
 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

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

Series 2. Spring oats

Residual effects of treatments applied to potatoes in 1948

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

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	1.6	-	-	3.0	0.2	0.2	3.0	0.9	2.3	
-shallow	6.8	6.2	5.4	-	-	7.0	6.6	6.6	7.0	
Dung	-0.9	-2.3	0.5	-0.7	-1.1	-	-	-0.7	-1.1	
Superphosphate	-0.1	-0.8	0.6	-0.3	0.1	0.1	-0.3	-	-	
Potash										

Roots (washed): Mean yield 8.93 tons per acre

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

Sugar Percentage: Mean 14.54

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

Tops: Mean yield 7.21 tons per acre

(±0.577) (±0.817)

Ploughing deep	0.04	-	-	0.65	-0.57	-0.20	0.28	0.06	0.02
-shallow	1.02	1.63	0.41	-	-	0.95	1.09	0.81	1.23
Dung	0.02	-0.22	0.26	-0.05	0.09	-	-	0.44	-0.40
Superphosphate	-0.05	-0.03	-0.07	-0.26	0.16	0.37	-0.47	-	-
Potash									

Plant Number: Mean 22.9 thousands per acre

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

Noxious Nitrogen: Mean 62.5

Ploughing deep	-1.2	-	-	1.3	-3.7	0.0	-2.4	-1.8	-0.6
-shallow	-1.2	1.3	-3.7	-	-	-1.2	-1.2	-1.8	-0.6
Dung	0.0	1.2	-1.2	0.0	0.0	-	-	3.1	-3.1
Superphosphate									
Potash									

49/Bb/1.5

Series 3. Sugar Beet

	Superphosphate			Potash			Mean
	None	Ploughed In seed in bed		None	Ploughed In seed in bed		
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	7.08	7.26	7.17	7.22	7.23
No dung	6.72	6.84	6.51	6.83	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
	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

	Superphosphate			Potash			Mean
	None	Floughed in	In seed bed	None	Floughed in	In seed bed	
Plant Number: thousands per acre							
Shallow	22.6	20.7	22.9	22.5	21.7	22.0	22.2
Deep	23.9	23.9	22.5	23.9	23.8	22.5	23.5
No dung	22.3	22.7	22.5	23.1	22.3	21.3	22.4
Dung	24.2	21.9	22.9	23.4	23.2	23.2	23.3
Mean	23.2	22.3	22.7	23.2	22.8	22.3	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	Floughing		Dung		Super.		Potash	
		Shallow	Deep	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.

Grain: Mean yield 33.7 cwt per acre

(±0.55)

(±0.78)

Floughing deep	0.9	-	-	0.8	1.0	1.0	0.8	0.8	1.0
-shallow									
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

Floughing deep	1.9	-	-	1.9	1.9	1.7	2.1	2.4	1.4
-shallow									
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	Ploughing		Dung		Super		Potash	
		Shallow	Deep	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.
Hay: Mean yield 65.8 cwt per acre									
	(±1.13)			(±1.59)					
Ploughing deep - shallow	1.5	-	-	3.0	0.0	0.3	2.7	-0.1	3.1
Dung	4.1	5.6	2.6	-	-	4.9	3.3	4.8	3.4
Superphosphate	1.1	-0.1	2.3	1.9	0.3	-	-	1.6	0.6
Potash	0.6	-1.0	2.2	1.3	-0.1	1.1	0.1	-	-

Series 6. Potatoes

	Mean	Ploughing		Dung		Super		Potash	
		Shallow	Deep	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.
Ware tubers: Mean yield 5.72 tons per acre									
	(±0.224)			(±0.317)					
Ploughing deep - shallow	-0.05	-	-	0.31	-0.41	0.11	-0.21	-0.23	0.13
Dung	2.36	2.72	2.00	-	-	2.22	2.50	3.17	1.55
Superphosphate	0.38	0.54	0.22	0.24	0.52	-	-	0.34	0.42
Potash	0.97	0.79	1.15	1.78	0.16	0.93	1.01	-	-
Percentage ware: Mean 94.2									
Ploughing deep - shallow	1.5	-	-	1.3	1.7	1.9	1.1	2.1	0.9
Dung	0.2	0.0	0.4	-	-	-0.1	0.5	1.5	-1.1
Superphosphate	-0.6	-0.4	-1.2	-1.1	-0.5	-	-	-0.3	-1.3
Potash	1.0	1.6	0.4	2.3	-0.3	1.5	0.5	-	-

49/Bb/1.8

Series 6. Potatoes

	Superphosphate			Potash			Mean
	None	Floughed in	In ridges	None	Floughed in	In ridges	
Ware tubers: tons per acre							
	(a)	(b) and (c)		(a)	(b) and (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.