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Yields of the Field Experiments 1951

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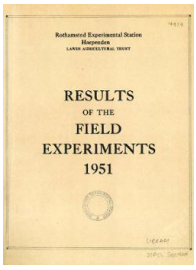

51/BB/1 Deep Cultivation Rotation - Rothamsted

Rothamsted Research

Rothamsted Research (1952) *51/BB/1 Deep Cultivation Rotation - Rothamsted ;* Yields Of The Field Experiments 1951, pp 23 - 30 **- DOI: https://doi.org/10.23637/ERADOC-1-171**

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51/Bb/1.1

DEEP CULTIVATION ROTATION EXPERIMENT

The 8th Year

Deep ploughing, fertilizers and dung - Long Hoos I and II 1951.

For details of rotation and treatments etc see Appendix Z 1950.

Area of each plot: 0.0312 acre. Area harvested: wheat, spring oats, barley, 0.0265 acre; ley 0.0275 acre; sugar beet (half plot), 0.0119 acre; potatoes (half plot), 0.0107 acre.

Cultivations, etc:

Sugar beet (Series 6)

Fertilizers for ploughing in applied: Sept 8. Dung applied and ploughed in 'deep': Sept 29. Dung applied and ploughed in 'shallow': Oct 3. Fertilizers for surface applications broadcast: Apr 26. Seed drilled at 18 lb per acre: May 2. Singled: June 20. Lifted: Nov 7. Variety: Klein E.

Barley (Series 2)

Ploughed: Feb 2 and again Mar 5. Basic slag applied: Apr 11. Seed drilled at 3 bushels per acre and basal sulphate of ammonia applied: Apr 16. Harvested: Sept 3. Variety: Plumage Archer.

Ley (Series 3)

Seeds undersown in barley: Mar 22 1950. Harvested: June 18 1951. Seeds mixture (per acre) 18 lb S.24 perennial ryegrass, 8 lb Montgomery red clover, 2 lb Canadian Alsike clover.

Wheat (Series 4)

Ploughed 'deep' plots: July 19. Ploughed 'shallow' plots: Aug 1. Ploughed all plots: Sept 18. Seed drilled at 3¼ bushels per acre: Nov 1. Basal sulphate of ammonia drilled: May 25. Harvested: Aug 16. Variety: Yeoman.

Potatoes (Series 5)

Fertilizers for ploughing in applied: Sept 8. Dung applied and ploughed in 'deep': Sept 28. Dung applied and ploughed in 'shallow': Oct 3. Ridged: May 15. Fertilizers applied in ridges, potatoes planted: May 18. Earthed up ridges: July 19. Sprayed with copper fungicide 5 lb per acre: Aug 15 and again Sept 8. Sprayed with 15% sulphuric acid: Sept 26. Lifted: Oct 12. Variety: Majestic.

Spring oats (Series 1)

Ploughed: Nov 6. Seed at 4 bushels per acre, and basal sulphate of ammonia drilled: Apr 16. Harvested: Aug 16. Variety: Star.

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Standard errors per plot:

Sugar beet	Total sugar,	whole plot, 4.21 cwt per acre or 13.4%	(4d.f)
		sub-plot, 2.06 cwt per acre or 6.6%	(7d.f)
	Tops,	whole plot, 1.65 tons per acre or 10.8%	(4d.f)
		sub-plot, 1.05 tons per acre or 6.9%	(7d.f)
Barley	Grain,	2.34 cwt per acre or 8.0%	(4d.f)
Ley	Hay,	2.90 cwt per acre or 5.0%	(4d.f)
Wheat	Grain,	3.66 cwt per acre or 14.0%	(4d.f)
Potatoes	Total clean tubers,	whole plot, 0.861 tons per acre or 18.0%	(4d.f)
		sub-plot, 1.249 tons per acre or 26.0%	(7d.f)
Spring oats	Grain,	0.819 cwt per acre or 2.4%	(4d.f)

Erratum to 1950 Results 50/Bb/1.1

Ley. The seeds mixture should have been shown as 18 lb Ryegrass S.24, 4 lb English red clover (Montgomery), 2 lb American Alsike clover.

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Summary of Results

Series 6: Sugar Beet

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Roots (washed): Mean yield 9.82 tons per acre									
Ploughing deep-shallow	1.55	-	-	2.13	0.97	1.91	1.19	1.35	1.75
Dung	2.05	2.63	1.47	-	-	2.93	1.17	2.53	1.57
Superphosphate	0.40	0.76	0.04	1.28	-0.48	-	-	0.95	-0.15
Potash	1.33	1.13	1.53	1.81	0.85	1.88	0.78	-	-
Sugar percentage: Mean 16.03									
Ploughing deep-shallow	-0.18	-	-	-0.35	-0.01	-0.28	-0.08	-0.10	-0.26
Dung	-0.01	-0.18	0.16	-	-	-0.07	0.05	-0.20	0.18
Superphosphate	0.11	0.01	0.21	0.05	0.17	-	-	0.10	0.12
Potash	0.18	0.26	0.10	-0.01	0.37	0.17	0.19	-	-
Total Sugar: Mean yield 31.4 cwt per acre									
	(±2.11)				(±2.98)				
Ploughing deep-shallow	4.6	-	-	6.2	3.0	5.5	3.7	4.1	5.1
Dung	6.6	8.2	5.0	-	-	9.3	3.9	7.7	5.5
Superphosphate	1.5	2.4	0.6	4.2	-1.2	-	-	3.2	-0.2
Potash	4.6	4.1	5.1	5.7	3.5	6.3	2.9	-	-
Tops: Mean yield 15.23 tons per acre									
	(±0.825)				(±1.167)				
Ploughing deep-shallow	0.66	-	-	1.61	-0.29	0.73	0.59	0.50	0.82
Dung	1.80	2.75	0.85	-	-	2.53	1.07	1.91	1.69
Superphosphate	0.26	0.33	0.19	0.99	-0.47	-	-	0.50	0.02
Potash	1.10	0.94	1.26	1.21	0.99	1.34	0.86	-	-
Plant Number: Mean 25.6 thousands per acre									
Ploughing deep-shallow	1.5	-	-	0.7	2.3	1.5	1.5	1.1	1.9
Dung	-0.4	-1.2	0.4	-	-	0.4	-1.2	-0.4	-0.4
Superphosphate	0.9	0.9	0.9	1.7	0.1	-	-	1.7	0.1
Potash	-0.2	-0.6	0.2	-0.2	-0.2	0.6	-1.0	-	-
Noxious Nitrogen: Mean 40.9 mgs. %									
Ploughing deep-shallow	0.6	-	-	4.4	-3.2	0.0	1.2	-1.9	3.1
Dung	2.5	6.3	-1.3	-	-	-1.3	6.3	1.9	3.1
Superphosphate	-0.6	-1.2	0.0	-4.4	3.2	-	-	5.6	-6.8
Potash	-3.8	-6.3	-1.3	-4.4	-3.2	2.4	-10.0	-	-

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Series 6: Sugar Beet

	None	Phosphate Ploughed in	Phosphate In seed bed	None	Potash Ploughed in	Potash In seed bed	Mean
Roots (washed): tons per acre							
Shallow	8.66	9.58	9.27	8.48	9.97	9.24	9.04
Deep	10.57	10.40	10.81	9.82	11.28	11.42	10.59
No dung	8.15	9.39	9.47	7.89	9.80	9.59	8.79
Dung	11.08	10.59	10.61	10.42	11.45	11.07	10.84
Mean	9.62	9.99	10.04	9.15	10.63	10.33	9.82
Sugar Percentage							
Shallow	16.12	16.12	16.15	15.99	16.20	16.30	16.12
Deep	15.84	15.93	16.16	15.89	15.97	16.02	15.94
No dung	16.01	15.84	16.29	16.04	15.82	16.26	16.04
Dung	15.94	16.21	16.02	15.84	16.36	16.07	16.03
Mean	15.98	16.02	16.16	15.94	16.09	16.16	16.03
Total Sugar: cwt per acre	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	27.9	30.8	29.8	27.1	32.3	30.1	29.1
Deep	33.5	33.2	35.0	31.2	36.1	36.6	33.8
No dung	26.1	29.6	30.8	25.3	30.9	31.2	28.2
Dung	35.4	34.3	34.0	33.0	37.4	35.5	34.7
Mean	30.7	32.0	32.4	29.1	34.2	33.3	31.4
Tops: tons per acre	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	14.74	14.40	15.73	14.43	15.09	15.65	14.90
Deep	15.46	15.11	16.21	14.93	15.99	16.40	15.56
No dung	13.84	14.43	15.22	13.73	14.65	15.22	14.33
Dung	16.36	15.07	16.72	15.63	16.43	16.82	16.13
Mean	15.10	14.75	15.97	14.68	15.54	16.02	15.23

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

Standard errors:	(a)	(b)	(c)
Total sugar	2.11	1.03	2.23
Tops	0.825	0.526	0.905

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Series 6: Sugar Beet

	Phosphate			Potash			
	None	Ploughed in	In seed bed	None	Ploughed in	In seed bed	Mean
Plant number: thousands per acre							
Shallow	24.4	25.9	24.8	25.1	24.7	24.4	24.9
Deep	25.9	26.5	27.2	26.3	26.3	26.7	26.4
No dung	25.0	26.5	26.9	25.9	25.6	25.9	25.8
Dung	25.3	25.8	25.1	25.5	25.4	25.2	25.4
Mean	25.1	26.2	26.0	25.7	25.5	25.6	25.6
Noxious nitrogen: mgs %							
Shallow	41.2	42.5	37.5	43.8	38.8	36.2	40.6
Deep	41.2	45.0	37.5	41.9	46.2	35.0	41.2
No dung	41.9	42.5	32.5	41.9	40.0	35.0	39.7
Dung	40.6	45.0	42.5	43.8	45.0	36.2	42.2
Mean	41.2	43.8	37.5	42.8	42.5	35.6	40.9

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Series 1: Barley

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 29.2 cwt per acre									
	(±1.17)					(±1.65)			
Ploughing deep-shallow	-0.3	-	-	0.1	-0.7	1.4	-2.0	-0.8	0.2
Dung	4.4	4.8	4.0	-	-	5.6	3.2	5.5	3.3
Superphosphate	-1.3	0.4	-3.0	-0.1	-2.5	-	-	-0.5	-2.1
Potash	0.9	0.4	1.4	2.0	-0.2	1.7	0.1	-	-
Straw: Mean yield 30.5 cwt per acre									
Ploughing deep-shallow	-3.6	-	-	-1.9	-5.3	0.0	-7.2	-4.5	-2.7
Dung	8.5	10.2	6.8	-	-	8.2	8.8	10.5	6.5
Superphosphate	-0.8	2.8	-4.4	-1.1	-0.5	-	-	-1.1	-0.5
Potash	1.3	0.4	2.2	3.3	-0.7	1.0	1.6	-	-

Series 3: Ley

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Hay: Mean yield 57.5 cwt per acre									
	(±1.45)					(±2.05)			
Ploughing deep-shallow	-1.1	-	-	-0.1	-2.1	-0.9	-1.3	-2.2	0.0
Dung	-0.6	0.4	-1.6	-	-	-0.8	-0.4	-3.6	2.4
Superphosphate	0.7	0.9	0.5	0.5	0.9	-	-	2.1	-0.7
Potash	-0.3	-1.4	0.8	-3.3	2.7	1.1	-1.7	-	-

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Series 4: Wheat

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 26.1 cwt per acre									
	(±1.83)					(±2.58)			
Ploughing deep-shallow	-0.5	-	-	0.4	-1.4	-0.6	-0.4	0.4	-1.4
Dung	-1.4	-0.5	-2.3	-	-	-3.6	0.8	-1.3	-1.5
Superphosphate	2.4	2.3	2.5	0.2	4.6	-	-	0.1	4.7
Potash	1.7	2.6	0.8	1.8	1.6	-0.6	4.0	-	-
Straw: Mean yield 33.3 cwt per acre									
Ploughing deep-shallow	3.1	-	-	0.4	5.8	3.3	2.9	1.4	4.8
Dung	3.2	0.5	5.9	-	-	0.0	6.4	0.6	5.8
Superphosphate	2.3	2.5	2.1	-0.9	5.5	-	-	-0.2	4.8
Potash	5.0	3.3	6.7	2.4	7.6	2.5	7.5	-	-

Series 5: Potatoes

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Total tubers: Mean yield 4.79 tons per acre									
	(±0.431)					(±0.609)			
Ploughing deep-shallow	-1.46	-	-	-0.71	-2.21	-1.08	-1.84	-1.05	-1.87
Dung	2.58	3.33	1.83	-	-	2.37	2.79	3.51	1.65
Superphosphate	0.87	1.25	0.49	0.66	1.08	-	-	0.93	0.81
Potash	1.39	1.80	0.98	2.32	0.46	1.45	1.33	-	-
Percentage ware: Mean yield 82.3									
Ploughing deep-shallow	-2.6	-	-	-1.0	-4.2	-3.5	-1.7	-2.8	-2.4
Dung	6.7	8.3	5.1	-	-	6.5	6.9	9.9	3.5
Superphosphate	-1.8	-2.7	-0.9	-2.0	-1.6	-	-	0.2	-3.8
Potash	4.1	3.9	4.3	7.3	0.9	6.1	2.1	-	-

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Potatoes

	Phosphate None	Phosphate Ploughed in	Phosphate In ridges	Potash None	Potash Ploughed in	Potash In ridges	Mean
	Total tubers: tons per acre						
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	4.90	5.34	6.95	4.63	5.90	6.95	5.53
Deep	3.82	3.61	5.01	3.58	3.86	5.24	4.06
No dung	3.17	3.01	4.65	2.35	3.76	5.55	3.50
Dung	5.55	5.94	7.31	5.85	5.99	6.64	6.08
Mean	4.36	4.47	5.98	4.10	4.88	6.10	4.79
	Percentage ware						
Shallow	85.0	84.7	79.8	81.7	86.1	85.0	83.6
Deep	81.4	80.1	81.1	78.9	83.1	83.2	81.0
No dung	80.0	77.8	78.2	75.4	81.7	83.4	79.0
Dung	86.4	87.0	82.7	85.2	87.5	84.7	85.6
Mean	83.2	82.4	80.4	80.3	84.6	84.1	82.3

Series I: Spring Oats

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
	Grain: Mean yield 34.9 cwt per acre								
Ploughing	(±0.41)					(±0.58)			
deep-shallow	2.2	-	-	1.9	2.5	-1.2	5.6	1.6	2.8
Dung	4.1	3.8	4.4	-	-	4.7	3.5	2.2	6.0
Superphosphate	2.0	-1.4	5.4	2.6	1.4	-	-	2.9	1.1
Potash	0.8	0.2	1.4	-1.1	2.7	1.7	-0.1	-	-
	Straw: Mean yield 36.7 cwt per acre								
Ploughing									
deep-shallow	0.0	-	-	2.4	-2.4	-2.4	2.4	-0.5	0.5
Dung	5.9	8.3	3.5	-	-	7.0	4.8	1.4	10.4
Superphosphate	2.8	0.4	5.2	3.9	1.7	-	-	1.9	3.7
Potash	3.7	3.2	4.2	-0.8	8.2	2.8	4.6	-	-

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

		(a)	(b)	(c)
Standard Error	Total tubers	0.431	0.624	0.617