

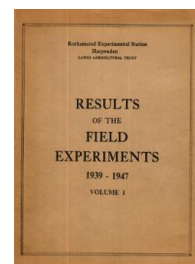
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A/5 Barnfield - Mangolds and Sugar Beet

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MANGOLDS AND SUGAR BEET - BARNFIELD

Experiments on root crops have been conducted on Barnfield since 1843. White turnips were grown from 1843-1848, followed by swedes until 1870 except for three years 1853-1855 when the crop was barley. Sugar beet was grown from 1871-1875 and then in 1876 the field was established under mangolds, variety Yellow Globe, with practically the present scheme of manuring. Since 1946 four rows of sugar beet, variety Klein E, have been drilled on each plot in order to compare the growth of mangolds and sugar beet under a wide range of fertilizer treatments. The leaves of the crops are spread and ploughed in on their respective plots.

Area of each plot, 1/7 to 1/5 acre.

Symbols and amounts per acre.

Cross Dressings

- O Unmanured
- N Nitrate of soda, 86 lb. N
- A Sulphate of ammonia, 86 lb. N
- C Rape cake, (castor bean meal from 1940 onwards) 2000 lb.

Strip Dressings

- P Superphosphate, 65 lb. P₂O₅
- K Sulphate of potash, 245 lb. K₂O
- S Sodium chloride, 200 lb.
- M Sulphate of magnesia, 200 lb.
- Ca Calcium chloride, 190 lb; potassium nitrate, 570 lb; calcium nitrate, 100 lb.
- D Farmyard manure, 14 tons

Treatments

Strip		Strip		Cross Dressings
1	D	6	PK	O
2	DFK	7	PSM	N
4	FKSM	8	O	A
5	P	9	NKSM	AC
				C

From 1904 onwards, plot 4N has been divided, 4(a) receiving the dressing NEKSM, 4(b) receiving the dressing NPCa.

Dung is ploughed down in winter. The mineral manures, castor bean meal, and one third of the sulphate of ammonia and nitrate of soda are applied after the first cultivation but before the seed is drilled. The remaining two-thirds of the nitrogenous fertilizers are applied as a top-dressing about the time of singling.

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Crop Notes

Year	Date sown	Date lifted	Year	Date sown	Date lifted
1939	May 9	Nov. 11	1944	May 3	Nov. 16
1940	May 10	Nov. 21	1945	April 18	Oct. 26
1941	April 18	Nov. 25	1946 ⁽¹⁾	May 3	Nov. 20
1942	May 1	Dec. 7	1946 ⁽²⁾	May 3	Nov. 11
1943	April 27	Nov. 5	1947 ⁽¹⁾	May 16	Oct. 31
			1947 ⁽²⁾	May 16	Oct. 30

- (1) Mangolds
- (2) Sugar beet

Investigations by the Soil Microbiology Department are described by A.V.Garcia, "Contribuicoes para o conhecimento da Microbiologia do solo. Estudos sobre as bacterias autoctones e amibas de tres talhoes do campo experimental de Barnfield", Anais do Instituto Superior de Agronomia 18. (1951) 1, and by B.N.Singh, "The effect of artificial fertilizers and dung on the numbers of amoebae in Rothamsted soils", J.Gen.Microbiol., 3, (1949) 204.

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Mangolds and Sugar Beet - Barnfield

Mangolds

Strip Dressing	Roots: tons per acre					Leaves: tons per acre				
	O	N	A	AC	C	O	N	A	AC	C
1939										
1 D	10.86	18.69	16.87	23.55	22.18	3.17	4.63	4.30	5.39	5.23
2 DPK	14.07	22.14	19.06	28.67	24.00	3.46	5.03	4.65	6.09	5.00
4 FKSM	3.62	18.05	15.42	25.60	18.99	1.20	4.09	3.54	5.71	3.72
4(b)PCa		17.76					4.82			
5 P	3.69	19.18	10.16	12.00	12.45	1.17	4.50	3.50	4.06	3.74
6 PK	3.07	17.41	15.91	23.09	17.76	0.95	4.34	3.25	5.62	3.72
7 FSM	3.51	19.35	18.19	23.90	20.76	1.10	4.63	3.70	4.92	4.29
8 O	2.29	9.71	6.48	10.03	10.31	0.92	3.57	2.90	3.91	3.98
9 NKSM	17.10	-	-	-	-	3.68	-	-	-	-
1940										
1 D	15.03	25.82	20.64	23.65	23.77	2.44	4.61	4.30	4.62	3.78
2 DPK	18.11	30.35	27.17	30.61	26.37	2.82	6.03	5.40	5.75	4.17
4 FKSM	4.43	21.81	18.51	28.19	22.65	1.13	4.38	3.47	5.21	3.86
4(b)PCa		21.85					4.56			
5 P	4.64	19.91	12.69	15.60	14.64	0.91	2.92	2.91	4.17	3.29
6 PK	4.33	20.67	16.31	26.09	20.24	0.86	2.84	2.41	4.43	3.17
7 FSM	3.87	22.42	18.52	21.48	21.79	0.99	4.29	3.93	5.71	4.75
8 O	5.53	17.73	10.30	12.11	13.22	1.02	3.90	3.20	4.01	3.49
9 NKSM	19.54	-	-	-	-	3.02	-	-	-	-
1941										
1 D	3.63	13.97	12.10	18.17	15.68	0.87	4.27	3.54	4.37	3.80
2 DPK	4.49	17.28	19.35	22.67	20.60	1.29	4.45	4.41	5.02	4.04
4 FKSM	0.12	8.54	9.40	19.39	17.12	0.08	2.90	2.91	4.15	3.02
4(b)PCa		6.03					2.18			
5 P	0.24	8.30	8.48	11.22	12.39	0.18	2.06	2.76	3.57	3.12
6 PK	0.43	8.59	12.42	15.29	15.16	0.25	1.91	2.50	3.72	2.87
7 FSM	0.16	6.47	10.20	18.57	15.89	0.12	1.65	2.55	4.06	3.26
8 O	0.70	3.50	2.61	3.06	2.97	0.34	1.54	1.46	0.91	1.16
9 NKSM	11.81	-	-	-	-	2.56	-	-	-	-
1942										
1 D	10.38	25.31	20.02	24.00	21.09	1.83	3.13	3.30	3.47	2.35
2 DPK	15.55	31.06	29.16	32.34	27.36	2.10	4.45	4.09	4.67	3.35
4 FKSM	1.64	24.04	22.56	31.08	24.95	0.32	3.60	2.84	4.28	2.30
4(b)PCa		22.93					4.31			
5 P	1.97	17.43	8.40	6.40	9.92	0.66	2.45	2.94	1.66	2.69
6 PK	1.14	20.81	18.62	23.46	19.62	0.34	2.98	1.88	3.74	2.01
7 FSM	0.75	22.25	17.77	18.74	19.94	0.10	3.77	2.54	3.03	3.33
8 O	2.40	15.78	8.61	6.10	8.17	0.78	4.13	2.69	2.45	2.79
9 NKSM	20.98	-	-	-	-	2.84	-	-	-	-

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Mangolds

Strip Dressing	Roots: tons per acre					Leaves: tons per acre				
	0	N	A	AC	C	0	N	A	AC	C
1943										
1 D	12.58	25.71	19.14	30.08	28.10	3.71	6.43	4.89	7.36	4.67
2 DPK	14.14	22.34	21.55	32.26	25.69	3.91	6.39	6.65	6.90	5.70
4 FKSM	2.28	11.24	12.79	29.92	18.27	1.08	7.12	4.53	6.97	5.82
4(b)PCa		13.36					6.36			
5 P	3.13	12.89	11.69	12.44	14.07	1.32	5.33	3.47	5.70	5.21
6 PK	2.18	17.64	15.84	27.85	19.47	0.66	4.21	3.62	6.17	3.47
7 FSM	1.86	17.85	13.72	22.91	23.06	0.68	6.09	4.67	6.17	5.43
8 0	1.82	17.52	10.85	11.47	12.21	1.05	5.26	4.21	7.88	5.24
9 NKSM	19.97	-	-	-	-	4.57	-	-	-	-
1944										
1 D	8.59	14.62	13.79	14.09	10.34	3.77	5.24	4.89	5.63	5.82
2 DPK	9.85	12.40	13.85	20.86	18.34	4.01	5.43	4.40	7.58	6.56
4 FKSM	1.48	8.06	6.76	16.30	9.53	0.76	4.31	3.91	6.51	4.40
4(b)PCa		9.16					3.96			
5 P	0.91	3.61	1.96	4.98	5.45	1.08	2.89	2.57	3.28	3.87
6 PK	1.27	7.16	8.31	19.66	14.17	1.13	4.26	4.99	5.99	3.62
7 FSM	1.31	4.70	4.88	16.27	14.18	0.95	3.16	3.28	6.19	4.75
8 0	0.44	5.69	2.67	5.71	5.21	0.61	3.87	2.59	4.35	4.06
9 NKSM	12.25	-	-	-	-	4.33	-	-	-	-
1945										
1 D	12.18	22.31	17.82	30.10	25.36	3.65	3.74	5.48	4.89	4.70
2 DPK	14.06	21.36	17.59	34.63	26.68	3.69	5.95	4.26	6.02	4.89
4 FKSM	3.61	16.99	18.09	32.45	20.52	1.52	5.82	6.21	7.12	4.09
4(b)PCa		15.57					5.33			
5 P	3.02	9.19	11.51	15.11	15.66	0.95	2.84	2.91	4.48	2.96
6 PK	3.20	14.41	14.47	33.32	24.51	1.20	5.31	3.89	5.21	3.06
7 FSM	2.98	10.43	13.53	21.36	20.83	0.81	3.96	5.02	4.53	4.45
8 0	3.19	12.16	8.06	13.41	15.51	1.08	5.19	4.01	2.76	3.43
9 NKSM	22.91	-	-	-	-	4.35	-	-	-	-
1946										
1 D	8.16	19.30	14.73	12.09	16.12	1.49	4.77	4.87	4.31	4.84
2 DPK	9.13	20.00	17.97	13.31	18.92	2.72	6.14	5.19	5.82	4.28
4 FKSM	2.14	12.76	8.72	16.20	13.50	7.29	4.87	2.98	4.01	3.77
4(b)PCa		15.35					4.72			
5 P	1.14	10.47	3.20	13.70	11.51	3.82	3.77	1.76	2.91	2.42
6 PK	1.50	9.02	8.97	28.85	13.54	3.57	2.25	3.28	4.48	3.57
7 FSM	1.46	12.02	8.58	11.19	9.75	3.28	3.65	2.52	4.50	2.40
8 0	1.46	4.03	2.71	12.69	13.33	3.07	1.49	2.25	2.25	3.33
9 NKSM	8.48	-	-	-	-	3.25	-	-	-	-

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Mangolds and Sugar Beet - Barnfield

Strip Dressings	Roots: tons per acre Cross Dressings					Leaves: tons per acre Cross Dressings				
	0	N	A	AC	C	0	N	A	AC	C
1947	Mangolds									
1 D	6.41	11.29	10.91	10.01	10.01	1.79	2.10	1.91	2.18	2.79
2 DPK	9.54	14.39	12.29	12.87	13.15	1.44	3.11	2.62	3.45	2.40
4 PKSM	3.10	10.57	7.29	7.86	9.84	1.44	2.62	2.25	2.45	2.45
4(b) PCa		11.52					2.18			
5 P	1.93	8.60	1.63	2.64	3.69	0.69	1.83	0.64	0.83	1.57
6 PK	2.27	7.76	6.07	7.36	6.88	0.61	2.45	1.61	2.23	2.35
7 PSM	1.89	8.22	7.11	5.25	4.49	0.59	2.37	1.93	1.83	1.57
8 0	0.57	0.71	0.42	3.51	3.67	0.44	0.59	0.49	0.98	1.13
9 NKSM	3.67	-	-	-	-	1.79	-	-	-	-
1946	Sugar beet									
	Roots (washed): tons per acre					Tops: tons per acre				
2 DPK	6.01	7.24	6.41	13.28	9.20	5.82	12.48	8.71	15.71	12.09
4 PKSM	1.27		5.06	8.54	6.80	2.69		4.26	10.42	5.97
4(b) PCa		8.12					9.39			
5 P	1.24	7.19	1.59	11.11	6.95	3.91	10.86	2.50	10.62	5.24
6 PK	1.17	6.39	4.89	9.59	10.13	2.40	9.54	3.77	15.02	7.93
7 PSM	1.43	7.66	5.50	6.12	8.32	3.62	6.85	5.63	12.09	12.87
8 0	0.38	2.79	2.10	8.12	7.24	1.50	4.11	2.50	11.35	11.06
1947										
1 D	6.28	7.65	7.60	6.34	8.02	4.65	6.41	6.46	5.48	7.19
2 DPK	4.92	7.05	5.65	6.26	8.24	5.97	6.56	5.72	5.58	6.70
4 PKSM	1.90		5.59	6.53	6.23	1.22		5.33	7.29	4.70
4(b) PCa		7.49					5.48			
5 P	2.28	5.65	1.90	3.01	4.06	1.03	6.80	2.50	3.13	3.91
6 PK	1.35	5.66	4.04	6.84	6.20	1.32	6.46	2.54	7.00	4.21
7 PSM	1.75	5.87	4.43	3.88	4.64	1.47	7.05	3.82	5.28	4.26
8 0	1.55	1.86	0.49	1.38	1.28	1.37	2.50	1.17	3.23	3.57

No Sugar beet was grown on strip 1 in 1946.

Molecular and Genetic Data - Genotype

Group	Accession	Genotype								Group	Accession	Genotype							
		1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8
1997	1	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	2	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	3	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	4	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	5	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	6	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	7	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
1998	1	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	2	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	3	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	4	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	5	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	6	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		
	7	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07		