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64/W/C/20 Soil Structure - Carrots and Red Beet

Rothamsted Research

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64/C/20.1

SOIL STRUCTURE 2

Effects of peat and subsoiling - Woburn Stackyard Field, plot 6 of Continuous Barley site red beet 1963, carrots 1964.

Design: 4 randomised blocks of 5 plots each, with plots split in 1964 for test of P. Two blocks were subsoiled.

Area of each plot: Red beet 1963: 0.0016, carrots 1964: 0.0008.

Area harvested: Red beet 1963: 0.0011, carrots 1964: 0.0006.

Treatments. All combinations of:-

- | | |
|-------------|--|
| Blocks | 1. Subsoiling: None (S0), subsoiled (S1) by hand to depth of 20 inches in 1963. |
| Whole plots | 2. Peat: None (0) - 2 plots per block, 62.5 cwt peat dry matter, applied to top 2 inches of soil alone (Sb), or with peat dug in to a depth of 8 inches, either at the same rate (Dg1) or at twice the rate (Dg2). |
| Sub plots | 3. P test (1964 only): None (P0), 0.6 cwt (P1) P205 as triple superphosphate. |

Basal dressings: Monoammonium phosphate, potassium nitrate and magnesium sulphate to supply the following:-

Red beet 1963: 200 lb N, 250 lb K and 500 lb Mg, all applied before digging except 82 lb N, applied as ammonium nitrate, half before and half after digging.

Carrots 1964: 100 lb N, 75 lb P, 200 lb K and 50 lb Mg. All Mg and four fifths NPK were dug in. The remaining NPK was applied to seedbed.

Cultivations, etc.:

Red beet 1963: Ground chalk applied at 30 cwt, basal dressings and half Dg2 peat applied, all plots rotary cultivated, remainder of Dg2 peat and all Dg1 applied, all plots rotary cultivated second time: Apr 18, 1964. Plots dug, appropriate blocks subsoiled, ground chalk applied at 10 cwt: Apr 19. Sb peat applied and pricked in: Apr 23. Seedbed N applied, seed drilled at 15 lb: May 15. Sprayed with DDT at 0.6 lb in 20 gals: June 7. Singled: July 2. Sprayed with a mixture of menazon, DDT and gamma BHC at 1.5 fluid oz in 40 gals: July 31. Lifted: Aug 8. Variety: Detroit Globe.

64/C/20.2

Carrots 1964: Dg peat and fertilisers applied, plots dug: Mar 6, 1964.
Sb peat and fertilisers applied and worked in: Apr 23. Seed
drilled at 7 lb: Apr 27. Sprayed with DDT at 0.6 lb in 20 gals:
May 20. Singled: June 4. Sprayed 5 times with a mixture of
menazon, DDT and gamma BHC at 1.5 fluid oz in 40 gals : June 25,
July 14, 21 and 28, Aug 7. Lifted: Sept 2. Variety: Autumn
King Red Cored.

NOTE: Soil samples were taken for PK analysis and crop samples for
estimation of dry matter and chemical analysis.

Standard errors per plot.

Red beet 1963

Roots:	0.608 or 9.1% (8 d.f.)
Tops:	0.376 or 8.6% (8 d.f.)
Roots and tops:	0.974 or 8.8% (8 d.f.)

Carrots 1964

Roots:	Whole plot: 0.563 or 3.5% (8 d.f.)
	Sub plot: 0.915 or 5.6% (10 d.f.)
Tops:	Whole plot: 0.286 or 5.2% (8 d.f.)
	Sub plot: 0.512 or 9.4% (10 d.f.)
Roots and tops:	Whole plot: 0.800 or 3.7% (8 d.f.)
	Sub plot: 1.385 or 6.4% (10 d.f.)

64/C/20.3

SUMMARY OF RESULTS

RED BEET 1963

	0	Sb	Sb+Dg1	Sb+Dg2	Mean
ROOTS					
	(± 0.304)*		(± 0.430)*		
S0	5.63	7.43	6.66	7.49	6.57
S1	5.65	7.37	7.63	7.56	6.77
Mean	5.64 (± 0.215)	7.40	7.14 (± 0.304)	7.52	6.67

TOPS

	(± 0.188)*		(± 0.266)*		
S0	3.88	4.73	4.05	4.63	4.24
S1	4.04	4.80	4.57	4.88	4.47
Mean	3.96 (± 0.133)	4.77	4.31 (± 0.188)	4.76	4.35

ROOTS AND TOPS

	(± 0.487)*		(± 0.689)*		
S0	9.52	12.17	10.71	12.12	10.80
S1	9.69	12.17	12.20	12.45	11.24
Mean	9.60 (± 0.344)	12.17	11.46 (± 0.487)	12.28	11.02

* For use in horizontal and interaction comparisons only

64/C/20.4

CARROTS 1964

	0	Sb	Sb+Dg1	Sb+Dg2	P0	P1	Mean
ROOTS							
Mean	(± 0.199) 15.58	15.97	(± 0.282) 16.91	17.06			16.22
S0	(± 0.282)* 15.09	15.68	(± 0.398)* 16.92	17.09	(± 0.289)* 15.97	15.97	15.97
S1	16.06	16.26	16.89	17.04	16.20	16.73	16.47
P0	(1)&(2) 15.47	15.72	(3)&(4) 16.55	17.21			(± 0.205) 16.09
P1	15.68	16.21	17.26	16.92			16.35
TOPS							
Mean	(± 0.101) 5.50	5.53	(± 0.143) 5.48	5.37			5.47
S0	(± 0.143)* 5.34	5.30	(± 0.202)* 5.35	5.20	(± 0.162)* 5.29	5.32	5.30
S1	5.65	5.76	5.61	5.54	5.57	5.72	5.64
P0	(1)&(2) 5.40	5.59	(3)&(4) 5.30	5.44			(± 0.115) 5.43
P1	5.58	5.47	5.66	5.30			5.52
ROOTS AND TOPS							
Mean	(± 0.283) 21.08	21.50	(± 0.400) 22.39	22.43			21.69
S0	(± 0.400)* 20.42	20.97	(± 0.566)* 22.26	22.29	(± 0.438)* 21.26	21.29	21.28
S1	21.72	22.02	22.51	22.58	21.77	22.45	22.11
P0	(1)&(2) 20.88	21.31	(3)&(4) 21.85	22.65			(± 0.310) 21.52
P1	21.26	21.68	22.92	22.21			21.87

ROOTS TOPS ROOTS &
TOPS

(1) (± 0.323)(± 0.181)(± 0.490) For use in vertical and interaction
 (3) (± 0.457)(± 0.256)(± 0.692) comparisons
 (2) (± 0.303)(± 0.163)(± 0.447) For use in horizontal and diagonal
 (4) (± 0.429)(± 0.231)(± 0.632) comparisons

* For use in horizontal and interaction comparisons