

CHAPTER 5

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CHAPTER 6

APPENDICES I

A: RUSTENBURG SOILS

1. The effects of P treatments and incubation time on the dialysis membrane tubes-hydrous ferric oxide extractable P (DMT-HFO-P_i) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	9313.57	716.43	2075.82	<.01
INC/PER (I/P)	4	7045.69	1761.42	5103.66	<.01
PHOSP.INC/PER (P.I/P)	52	3280.82	63.09	182.81	<.01
REPS.	2	0.18	0.09	0.25	
Residual	140	48.32	0.35		
Total	209	19688.39			

SE = 0.59; CV = 4.8

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	2.50 ^a	2.87 ^{ab}	2.75 ^{ab}	2.58 ^{ab}	2.79 ^{ab}	2.70 ^a
5	4.84 ^{bc}	4.58 ^{bc}	4.00 ^{ab}	3.92 ^{ab}	4.02 ^{ab}	4.27 ^b
10	6.30 ^c	5.29 ^{bc}	4.17 ^b	4.00 ^{ab}	3.88 ^{ab}	4.73 ^b
20	9.42 ^{de}	6.09 ^c	4.83 ^{bc}	4.33 ^{bc}	4.17 ^b	5.77 ^c
25	9.73 ^{de}	6.08 ^c	5.65 ^{bc}	5.08 ^{bc}	4.63 ^{bc}	6.24 ^d
50	17.10 ^{hi}	6.92 ^{cd}	6.17 ^c	5.57 ^{bc}	5.79 ^c	8.31 ^e
75	23.85 ^l	7.33 ^{cd}	6.58 ^c	6.50 ^c	6.46 ^c	10.15 ^f
100	30.59 ^m	12.00 ^f	9.17 ^{de}	8.42 ^d	8.39 ^d	13.71 ^g
125	32.72 ⁿ	15.67 ^h	10.37 ^e	9.75 ^{de}	9.46 ^{de}	15.59 ^h
150	35.12 ^p	16.92 ^{hi}	13.23 ^{fg}	9.58 ^{de}	9.49 ^{de}	16.87 ⁱ
175	35.55 ^p	18.33 ⁱ	14.92 ^{gh}	10.38 ^e	10.88 ^{ef}	18.01 ^j
200	40.09 ^q	19.58 ^j	15.17 ^{gh}	14.00 ^g	12.59 ^{fg}	20.29 ^k
225	41.79 ^r	20.21 ^{jk}	16.33 ^{hi}	14.50 ^{gh}	13.79 ^g	21.33 ^l
250	42.01 ^r	21.37 ^k	17.75 ⁱ	17.08 ^{hi}	14.17 ^{gh}	22.48 ^m
Means ²	23.69 ^d	11.66 ^c	9.36 ^b	8.26 ^a	7.89 ^a	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 0.72, I/P = 0.43, P.I/P = 1.61] for Means^{1,2,3} respectively.

2. The effects of P treatments and incubation time on the 0.5M NaHCO₃ extractable inorganic P (-HCO₃-P_i) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	21577.76	1659.83	2697.76	<.01
INC/PER (I/P)	4	11056.34	2764.09	4492.53	<.01
PHOSP.INC/PER (P.I/P)	52	2720.79	52.32	85.04	<.01
REPS	2	3.41	1.71	2.85	
Residual	140	86.14	0.62		
Total	209	35441.03			

SE = 0.78; CV = 4.6

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	6.30 ^{bc}	6.00 ^{bc}	4.20 ^{ab}	3.17 ^{ab}	2.90 ^a	4.51 ^a
5	8.87 ^{cd}	4.50 ^{ab}	3.50 ^{ab}	3.33 ^{ab}	3.46 ^{ab}	4.73 ^a
10	11.55 ^{de}	5.67 ^{bc}	3.83 ^{ab}	4.00 ^{ab}	4.04 ^{ab}	5.82 ^b
20	17.38 ^g	6.25 ^{bc}	4.75 ^{ab}	4.42 ^{ab}	4.21 ^{ab}	7.40 ^c
25	17.42 ^g	7.58 ^c	5.17 ^b	4.67 ^{ab}	4.42 ^{ab}	7.85 ^c
50	25.99 ^j	13.75 ^{ef}	8.08 ^{cd}	5.92 ^{bc}	5.63 ^{bc}	11.87 ^d
75	27.32 ^j	16.33 ^{fg}	10.00 ^d	8.42 ^{cd}	8.09 ^{cd}	14.03 ^e
100	32.00 ^k	18.08 ^g	12.50 ^e	9.92 ^d	9.71 ^{cd}	16.44 ^f
125	35.93 ^l	20.92 ^h	18.25 ^{gh}	15.00 ^f	12.54 ^e	20.53 ^g
150	51.89 ⁿ	24.08 ^{ij}	20.33 ^h	15.58 ^{fg}	15.38 ^{fg}	25.45 ^h
175	53.96 ⁿ	25.17 ^{ij}	21.17 ^h	17.92 ^g	16.00 ^{fg}	26.84 ⁱ
200	67.13 ^p	31.25 ^k	23.58 ⁱ	20.92 ^h	19.25 ^{gh}	32.43 ^j
225	75.51 ^q	34.83 ^l	24.50 ^{ij}	26.50 ^j	21.46 ^{hi}	36.56 ^k
250	77.44 ^q	38.50 ^m	26.83 ^j	27.22 ^j	23.75 ⁱ	38.75 ^l
Means ²	36.34 ^e	18.07 ^d	13.34 ^c	11.93 ^b	10.88 ^a	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 0.96, I/P = 0.58, P.I/P = 2.15] for Means ^{1,2,3} respectively.

3. The effects of P treatments and incubation period on the 0.5m NaHCO₃ extractable organic P (-HCO₃-P_o) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	v.r.	F pr.
PHOSP (P)	13	1739.00	133.77	161.78	<.01
INC/PER (I/P)	4	5913.93	1478.48	1788.10	<.01
PHOSP.INC/PER (P.I/P)	52	554.75	10.67	12.90	<.01
REPS.	2	4.44	2.22	2.75	
Residual	140	115.76	0.83		
Total	209	8323.43			

SE = 0.91; CV = 6.8

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	10.00 ^{bc}	10.00 ^{bc}	11.00 ^{cd}	5.08 ^{ab}	4.86 ^a	8.19 ^a
5	10.23 ^{cd}	11.83 ^{cd}	12.67 ^d	5.33 ^{ab}	5.04 ^{ab}	9.02 ^{ab}
10	10.80 ^{cd}	12.42 ^{cd}	13.08 ^d	6.17 ^{ab}	5.29 ^{ab}	9.55 ^b
20	11.13 ^{cd}	13.75 ^{de}	13.83 ^{de}	6.17 ^{ab}	5.96 ^{ab}	10.17 ^b
25	10.47 ^{cd}	14.75 ^{de}	15.00 ^{de}	6.92 ^{ab}	6.00 ^{ab}	10.63 ^b
50	10.72 ^{cd}	18.17 ^{ef}	17.67 ^{ef}	7.33 ^{ab}	6.46 ^{ab}	12.07 ^c
75	10.48 ^{cd}	20.50 ^{fg}	19.67 ^f	7.92 ^{bc}	6.59 ^{ab}	13.03 ^{cd}
100	11.37 ^{cd}	22.67 ^g	19.33 ^f	8.33 ^{bc}	6.88 ^{ab}	13.72 ^d
125	11.50 ^{cd}	23.50 ^{gh}	19.42 ^f	8.33 ^{bc}	6.96 ^{ab}	13.94 ^d
150	11.77 ^{cd}	24.00 ^{gh}	21.50 ^{fg}	8.67 ^{bc}	7.29 ^{ab}	14.65 ^{de}
175	11.97 ^{cd}	26.00 ^h	22.50 ^g	10.17 ^{cd}	7.50 ^b	15.63 ^e
200	12.90 ^d	26.17 ^h	23.00 ^{gh}	13.08 ^d	9.00 ^{bc}	16.83 ^f
225	16.17 ^e	26.37 ^h	24.00 ^{gh}	13.67 ^{de}	10.04 ^c	18.05 ^g
250	16.63 ^e	26.50 ^h	25.50 ^h	15.78 ^e	13.75 ^{de}	19.63 ^h
Means ²	1.87 ^c	19.76 ^e	18.44 ^d	8.78 ^b	7.26 ^a	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.12, I/P = 0.67, P.I/P = 2.50] for Means ^{1,2,3} respectively.

4. The effects of added P and incubation period on the 0.1M NaOH extractable inorganic P (-OH-P_i) of Rustenburg soil.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	64062.48	4927.88	1559.37	<.01
INC/PER (I/P)	4	33278.94	8319.74	2632.69	<.01
PHOSP.INC/PER (P.I/P)	52	6923.16	133.14	42.13	<.01
REPS	2	6.17	3.08	0.98	
Residual	140	442.42	3.16		
Total	209	104707.02			

SE = 1.78; CV = 2.6

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	30.00 ^a	34.33 ^{ab}	43.42 ^{cd}	44.08 ^{cd}	46.70 ^d	39.71 ^a
5	35.80 ^b	38.83 ^{bc}	44.08 ^{cd}	47.33 ^{de}	47.00 ^d	42.61 ^b
10	36.60 ^b	40.33 ^{bc}	45.67 ^{cd}	51.00 ^d	50.33 ^{de}	44.79 ^{bc}
20	37.73 ^{bc}	41.50 ^c	46.67 ^d	52.17 ^e	53.00 ^e	46.21 ^c
25	38.80 ^{bc}	42.00 ^{cd}	48.25 ^{de}	52.17 ^e	53.67 ^e	46.98 ^c
50	39.37 ^{bc}	52.08 ^e	54.17 ^e	60.00 ^f	63.33 ^{fg}	53.79 ^d
75	40.47 ^{bc}	63.83 ^{fg}	68.67 ^{gh}	71.17 ^h	70.33 ^{gh}	62.89 ^e
100	61.03 ^f	69.33 ^{gh}	72.00 ^h	78.67 ⁱ	80.00 ^{ij}	72.21 ^f
125	66.00 ^g	83.50 ^{ij}	83.33 ^{ij}	85.33 ^j	85.67 ^j	80.77 ^g
150	68.20 ^{gh}	83.67 ^j	85.25 ^j	87.17 ^j	93.00 ^k	83.46 ^h
175	70.30 ^{gh}	84.42 ^j	95.33 ^{kl}	98.67 ^{lm}	103.00 ^m	90.34 ⁱ
200	82.53 ^{ij}	94.42 ^{kl}	98.00 ^l	103.00 ^m	104.00 ^m	96.39 ^j
225	86.33 ^j	97.33 ^{kl}	102.00 ^{lm}	103.83 ^{lm}	105.33 ^m	98.76 ^k
250	87.10 ^j	102.58 ^{lm}	105.17 ^m	105.33 ^m	107.00 ^m	101.44 ^l
Means ²	55.73 ^a	66.30 ^b	70.86 ^c	74.21 ^d	75.88 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 2.18, I/P = 1.30, P.I/P = 4.88] for Means ^{1,2,3} respectively.

5. The effects of P treatments and incubation period on the 0.1M NaOH extractable organic P (-OH-P_o) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	6402.45	492.50	376.21	<.01
INC/PER (I/P)	4	2737.93	684.48	522.86	<.01
PHOSP.INC/PER (P.I/P)	52	1494.53	28.74	21.95	<.01
REPS.	2	15.20	7.60	6.24	
Residual	140	183.28	1.31		
Total	209	10818.19			

SE = 1.14; CV = 5.2

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	13.80 ^{ab}	14.17 ^{ab}	15.21 ^{ab}	13.33 ^{ab}	12.42 ^a	13.79 ^a
5	13.97 ^{ab}	14.75 ^{ab}	15.96 ^b	14.17 ^{ab}	13.00 ^{ab}	14.37 ^{ab}
10	13.93 ^{ab}	14.84 ^{ab}	16.17 ^b	15.33 ^{ab}	13.08 ^{ab}	14.67 ^{ab}
20	14.40 ^{ab}	15.09 ^{ab}	17.08 ^{bc}	15.58 ^b	13.83 ^{ab}	15.40 ^b
25	14.47 ^{ab}	16.34 ^b	17.25 ^{bc}	16.67 ^{bc}	15.00 ^{ab}	15.95 ^b
50	14.97 ^{ab}	20.63 ^{cd}	22.33 ^{cd}	20.00 ^c	17.08 ^{bc}	19.00 ^c
75	14.80 ^{ab}	20.75 ^{cd}	23.50 ^d	21.58 ^{cd}	19.67 ^c	20.06 ^c
100	15.10 ^{ab}	24.25 ^{de}	25.58 ^{de}	22.33 ^{cd}	20.33 ^{cd}	21.52 ^d
125	16.03 ^b	25.25 ^{de}	25.75 ^{de}	23.25 ^d	21.58 ^{cd}	22.37 ^{de}
150	15.90 ^b	25.92 ^{de}	26.88 ^e	24.50 ^{de}	23.17 ^d	23.27 ^e
175	15.67 ^b	26.13 ^e	27.93 ^e	25.75 ^{de}	24.00 ^{de}	24.50 ^e
200	15.97 ^b	26.79 ^e	28.08 ^e	26.17 ^{de}	24.83 ^{de}	24.37 ^e
225	21.67 ^{cd}	27.17 ^e	28.25 ^e	27.25 ^e	26.08 ^{de}	26.08 ^f
250	24.90 ^{de}	28.38 ^e	28.92 ^e	28.67 ^e	26.00 ^{de}	27.37 ^f
Means ²	16.18 ^a	21.68 ^d	22.78 ^e	21.04 ^c	19.29 ^b	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.40, I/P = 0.84, P.I/P = 3.14] for Means ^{1,2,3} respectively.

6. The effects of P treatments and incubation on the 1M HCl extractable Ca - bound P (D/HCl-P_i) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	6912.10	531.70	755.36	<.01
INC/PER (I/P)	4	1990.17	497.54	706.84	<.01
PHOSP.INC/PER (P.I/P)	52	522.16	10.04	14.27	<.01
REPS.	2	3.42	1.72	2.48	
Residual	140	98.55	0.70		
Total	209	9522.97			

SE = 0.84; CV = 4.7

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	6.73 ^a	6.92 ^{ab}	7.25 ^{ab}	8.00 ^{ab}	8.85 ^{ab}	7.55 ^a
5	6.79 ^{ab}	7.33 ^{ab}	8.17 ^{ab}	8.17 ^{ab}	9.00 ^{ab}	7.89 ^{ab}
10	6.84 ^{ab}	8.17 ^{ab}	8.50 ^{ab}	9.67 ^b	10.97 ^{bc}	8.83 ^b
20	6.97 ^{ab}	9.08 ^b	9.80 ^b	10.50 ^{bc}	12.92 ^{cd}	9.85 ^b
25	7.14 ^{ab}	9.42 ^b	10.17 ^b	12.33 ^c	13.33 ^{cd}	10.48 ^c
50	9.76 ^b	12.33 ^c	13.21 ^{cd}	15.17 ^{de}	16.92 ^{de}	13.48 ^d
75	12.30 ^c	13.17 ^{cd}	14.67 ^d	17.33 ^e	18.42 ^{ef}	15.18 ^e
100	13.40 ^{cd}	15.08 ^{de}	16.08 ^{de}	18.17 ^{ef}	20.33 ^{fg}	16.61 ^f
125	13.72 ^{cd}	16.58 ^{de}	17.29 ^e	20.50 ^{fg}	22.58 ^g	18.13 ^g
150	14.05 ^{cd}	17.58 ^e	18.92 ^{ef}	21.83 ^{fg}	23.75 ^{gh}	19.23 ^h
175	14.50 ^{cd}	18.93 ^{ef}	20.17 ^f	23.00 ^g	25.92 ^h	20.50 ⁱ
200	15.07 ^{de}	19.92 ^f	22.04 ^{fg}	24.83 ^{gh}	27.17 ^{hi}	21.81 ^j
225	19.40 ^{ef}	22.75 ^g	24.58 ^{gh}	25.33 ^h	28.92 ⁱ	24.20 ^k
250	21.40 ^{fg}	24.67 ^{gh}	24.83 ^{gh}	29.67 ⁱ	30.67 ⁱ	26.25 ^l
Means ²	12.01 ^a	14.42 ^b	15.41 ^c	17.46 ^d	19.27 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.03, I/P = 0.62, P.I/P = 2.30] for Means ^{1,2,3} respectively.

7. The effects of added P and incubation period on the conc. HCl digestible inorganic P (C/HCl-P_i) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	25784.60	1983.43	678.03	<.01
INC/PER (I/P)	4	33602.61	8400.65	2871.74	<.01
PHOSP.INC/PER (P.I/P)	52	14049.55	270.18	92.36	<.01
REPS.	2	32.64	16.32	5.98	
Residual	140	409.54	2.92		
Total	209	73846.30			

SE = 1.71; CV = 2.3

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	50.93 ^a	58.00 ^{bc}	58.33 ^{bc}	59.00 ^{bc}	59.60 ^{bc}	57.17 ^a
5	50.93 ^a	58.67 ^{bc}	58.33 ^{bc}	59.67 ^{bc}	59.95 ^{bc}	57.51 ^a
10	50.93 ^a	59.33 ^{bc}	60.23 ^{bc}	59.67 ^{bc}	60.43 ^c	58.12 ^{ab}
20	51.10 ^{ab}	59.67 ^{bc}	61.00 ^{cd}	60.33 ^c	60.94 ^c	58.61 ^{ab}
25	51.60 ^{ab}	60.00 ^{bc}	61.33 ^{cd}	62.33 ^{cd}	64.62 ^{cd}	59.98 ^b
50	53.83 ^{ab}	62.33 ^{cd}	65.00 ^{cd}	68.67 ^{de}	70.67 ^e	64.10 ^c
75	55.63 ^b	63.67 ^{cd}	70.67 ^e	71.33 ^{ef}	78.54 ^{fg}	67.97 ^d
100	56.93 ^{bc}	65.67 ^d	76.00 ^{fg}	78.67 ^{fg}	80.10 ^{fg}	71.47 ^e
125	57.73 ^{bc}	68.67 ^{de}	77.33 ^{fg}	80.33 ^g	87.08 ^{hi}	74.23 ^f
150	60.97 ^c	70.33 ^{de}	80.67 ^g	86.00 ^h	89.96 ^{hi}	77.59 ^g
175	61.67 ^{cd}	72.67 ^{ef}	89.00 ^{hi}	91.00 ^{ij}	94.02 ^{ij}	81.67 ^h
200	63.73 ^{cd}	75.33 ^{ef}	93.00 ⁱ	98.00 ^j	100.54 ^{jk}	86.12 ⁱ
225	69.87 ^{de}	89.33 ^{hi}	93.67 ^{ij}	103.67 ^k	105.12 ^k	92.33 ^j
250	75.47 ^f	93.00 ⁱ	95.00 ^{ij}	106.00 ^k	107.48 ^k	95.39 ^k
Means ²	57.95 ^a	68.33 ^b	74.25 ^c	77.48 ^d	79.93 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 2.10, I/P = 1.26, P.I/P = 4.69] for Means ^{1,2,3} respectively.

8. The effects of P treatments and incubation period on the conc. HCl digestible organic P (C/HCl-P_o) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	1622.48	124.81	67.54	<.01
INC/PER (I/P)	4	1408.38	352.10	190.54	<.01
PHOSP.INC/PER (P.I/P)	52	417.73	8.03	4.35	<.01
REPS.	2	0.90	0.45	0.24	
Residual	140	258.71	1.85		
Total	209	3707.30			

SE = 1.36; CV = 7.8

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	9.67 ^a	11.75 ^{ab}	12.83 ^{ab}	13.33 ^{ab}	13.52 ^b	12.22 ^a
5	9.70 ^a	11.83 ^{ab}	12.83 ^{ab}	13.67 ^b	14.88 ^{bc}	12.58 ^a
10	9.70 ^a	11.92 ^{ab}	12.90 ^{ab}	13.67 ^b	15.77 ^{bc}	12.97 ^a
20	9.70 ^a	11.92 ^{ab}	13.00 ^{ab}	14.00 ^{bc}	16.68 ^{bc}	13.06 ^a
25	9.73 ^a	12.17 ^{ab}	13.17 ^{ab}	14.60 ^{bc}	16.71 ^{bc}	13.28 ^{ab}
50	10.10 ^{ab}	13.50 ^b	15.00 ^{bc}	16.40 ^{bc}	19.21 ^{cd}	14.84 ^b
75	10.30 ^{ab}	15.92 ^{bc}	16.33 ^{bc}	18.33 ^{cd}	19.87 ^{cd}	16.15 ^{bc}
100	10.50 ^{ab}	16.25 ^{bc}	18.50 ^{cd}	18.67 ^{cd}	20.52 ^{cd}	16.89 ^c
125	13.60 ^b	17.42 ^c	18.67 ^{cd}	19.00 ^{cd}	21.67 ^d	18.07 ^{cd}
150	13.65 ^b	17.93 ^{cd}	19.00 ^{cd}	20.00 ^{cd}	21.75 ^d	18.47 ^{cd}
175	13.70 ^{bc}	18.83 ^{cd}	19.67 ^{cd}	20.33 ^{cd}	23.35 ^{de}	19.24 ^d
200	13.80 ^{bc}	19.25 ^{cd}	20.67 ^{cd}	21.33 ^d	23.67 ^{de}	19.74 ^{de}
225	14.47 ^{bc}	21.25 ^d	20.33 ^{cd}	25.67 ^e	24.24 ^{de}	21.19 ^e
250	14.53 ^{bc}	22.42 ^d	20.33 ^{cd}	29.33 ^e	29.35 ^e	23.19 ^f
Means ²	11.68 ^a	15.88 ^b	16.66 ^b	18.45 ^c	20.09 ^d	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.67, I/P = 1.00, P.I/P = 3.73] for Means ^{1,2,3} respectively.

9. The Effects of added P and incubation period on the conc. H₂SO₄ and H₂O₂ digestible P (H₂SO₄-P_i) of Rustenburg soil.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	18143.74	1395.67	530.63	<.01
INC/PER (I/P)	4	18232.71	558.18	1733.01	<.01
PHOSP.INC/PER (P.I/P)	52	5166.26	99.35	37.77	<.01
REPS.	2	15.47	7.74	3.03	
Residual	140	368.23	2.63		
Total	209	41910.95			

SE = 1.62; CV = 2.3

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	55.27 ^a	55.73 ^{ab}	56.50 ^{ab}	60.67 ^{bc}	61.83 ^{bc}	58.00 ^a
5	55.88 ^{ab}	56.00 ^{ab}	58.17 ^{ab}	60.83 ^{bc}	64.00 ^{bc}	58.98 ^a
10	56.00 ^{ab}	56.33 ^{ab}	58.33 ^{ab}	61.00 ^{bc}	64.58 ^{bc}	59.25 ^a
20	56.00 ^{ab}	56.33 ^{ab}	58.57 ^{ab}	61.67 ^{bc}	64.58 ^{bc}	59.43 ^a
25	56.17 ^{ab}	56.67 ^{ab}	58.83 ^{ab}	62.00 ^{bc}	65.67 ^c	59.87 ^a
50	56.83 ^{ab}	59.00 ^{ab}	65.67 ^c	67.67 ^{cd}	70.17 ^d	63.87 ^b
75	56.93 ^{ab}	61.33 ^{bc}	72.83 ^{de}	70.67 ^d	75.17 ^e	67.39 ^c
100	57.33 ^{ab}	65.22 ^c	74.17 ^{de}	73.67 ^{de}	78.58 ^{ef}	69.79 ^d
125	57.50 ^{ab}	64.88 ^c	75.50 ^e	81.33 ^f	89.42 ^{gh}	73.73 ^e
150	59.50 ^{ab}	72.38 ^{de}	80.17 ^f	86.67 ^g	89.67 ^{gh}	77.68 ^f
175	60.17 ^b	76.33 ^{ef}	86.67 ^g	93.00 ^h	96.00 ^{hi}	82.43 ^g
200	61.67 ^{bc}	80.47 ^f	89.50 ^{gh}	93.33 ^h	99.17 ⁱ	84.83 ^h
225	67.83 ^{cd}	87.17 ^g	93.33 ^h	94.33 ^h	105.08 ^j	89.55 ⁱ
250	69.00 ^{cd}	88.08 ^g	94.17 ^h	94.67 ^h	106.50 ^j	90.48 ⁱ
Means ²	59.01 ^a	66.85 ^b	73.03 ^c	75.82 ^d	80.74 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.99, I/P = 1.19, P.I/P = 4.45] for Means ^{1,2,3} respectively.

10. The effects of P treatments and incubation periods on the total inorganic P (HFO-P_i + HCO₃-P_i + OH-P_i + conc. HCl-P_i + conc. H₂SO₄-P_i) (TOTP_i) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	746010.18	57385.40	4738.96	<.01
INC/PER (I/P)	4	123948.14	30987.03	2558.95	<.01
PHOSP.INC/PER (P.I/P)	52	27741.92	533.50	44.06	<.01
REPS.	2	218.61	109.31	10.21	
Residual	140	1695.30	12.11		
Total	209	899395.54			

SE = 3.48; CV = 1.3

(ii) Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	158.74 ^a	167.85 ^{ab}	172.45 ^{bc}	177.50 ^{bc}	180.47 ^c	171.40 ^a
5	165.04 ^{ab}	171.92 ^{bc}	183.25 ^c	188.75 ^{cd}	188.42 ^{cd}	179.48 ^b
10	168.52 ^b	184.12 ^c	195.97 ^d	208.00 ^{ef}	199.23 ^{de}	191.17 ^c
20	185.60 ^c	196.92 ^d	199.38 ^{de}	224.75 ^{fg}	220.82 ^{fg}	205.49 ^d
25	186.86 ^{cd}	199.75 ^{de}	210.40 ^{ef}	230.58 ^{gh}	238.34 ^h	213.19 ^e
50	206.88 ^e	217.42 ^f	236.29 ^{gh}	255.98 ⁱ	261.50 ⁱ	235.62 ^f
75	215.91 ^{ef}	245.67 ^h	264.42 ^{ij}	282.42 ^{kl}	281.01 ^k	257.88 ^g
100	235.29 ^g	262.38 ^{ij}	273.92 ^{jk}	293.50 ^{lm}	297.12 ^{lm}	272.44 ^h
125	243.61 ^h	278.22 ^{jk}	286.08 ^{kl}	309.25 ^{mn}	318.75 ^{np}	287.18 ⁱ
150	252.73 ⁱ	283.97 ^{kl}	308.57 ^{mn}	324.83 ^p	333.34 ^{pq}	300.69 ^j
175	268.14 ^{ij}	298.85 ^{lm}	313.25 ⁿ	343.97 ^q	345.81 ^q	314.00 ^k
200	271.22 ^j	307.97 ^{mn}	338.29 ^q	362.08 ^{rs}	370.71 ^s	330.05 ^l
225	290.73 ^l	321.63 ^{np}	347.42 ^{qr}	371.17 ^s	384.71 ^{tu}	343.13 ^m
250	302.42 ^m	338.20 ^q	356.75 ^r	381.97 ^t	391.56 ^u	354.18 ⁿ
Means ²	225.12 ^a	248.20 ^b	263.32 ^c	282.48 ^d	286.56 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 4.27, I/P = 2.55, P.I/P = 9.55] for Means ^{1,2,3} respectively.

11. The effects of P treatments and incubation period on the total organic P ($\text{HCO}_3\text{-P}_o + \text{OH-P}_o + \text{conc. HCl-P}_o$) (TOT-P_o) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	26028.06	2002.16	493.92	<.01
INC/PER (I/P)	4	12693.95	3173.49	782.88	<.01
PHOSP.INC/PER (P.I/P)	52	3748.98	72.10	17.79	<.01
REPS.	2	24.80	12.40	3.15	
Residual	140	567.51	4.05		
Total	209	43038.50			

SE = 2.01; CV = 3.8

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	34.47 ^{bc}	36.92 ^{bc}	38.05 ^{bc}	29.75 ^{ab}	25.80 ^a	33.00 ^a
5	36.53 ^{bc}	39.42 ^{cd}	40.96 ^{cd}	33.17 ^b	28.93 ^{ab}	35.80 ^b
10	37.13 ^{bc}	51.17 ^{ef}	43.85 ^d	40.17 ^{cd}	34.15 ^{bc}	41.29 ^c
20	37.93 ^{bc}	53.75 ^{ef}	44.92 ^d	46.75 ^{de}	39.47 ^{cd}	44.56 ^d
25	37.67 ^{bc}	57.17 ^f	50.42 ^e	49.18 ^{de}	42.21 ^{cd}	47.33 ^e
50	38.78 ^c	58.30 ^{fg}	61.00 ^{fg}	51.73 ^{ef}	46.75 ^{de}	51.31 ^f
75	38.58 ^{bc}	60.17 ^{fg}	62.50 ^{fg}	52.83 ^{ef}	50.13 ^{de}	52.84 ^g
100	39.97 ^{cd}	64.17 ^{gh}	65.42 ^{gh}	55.33 ^{ef}	50.73 ^{ef}	55.12 ^h
125	41.13 ^{cd}	67.17 ^{gh}	65.83 ^{gh}	55.58 ^{ef}	54.42 ^{ef}	56.83 ^{hi}
150	41.70 ^{cd}	72.85 ^{hi}	66.38 ^{gh}	57.17 ^f	54.21 ^{ef}	58.46 ⁱ
175	41.13 ^{cd}	73.96 ^{hi}	68.10 ^{gh}	59.25 ^{fg}	56.85 ^{ef}	59.86 ⁱ
200	42.67 ^{cd}	78.21 ⁱ	68.75 ^{gh}	63.58 ^g	58.51 ^{fg}	62.34 ^j
225	52.30 ^{ef}	83.78 ^j	69.58 ^h	72.58 ^h	60.36 ^{fg}	67.72 ^k
250	56.07 ^f	86.29 ^j	72.75 ^{hi}	81.78 ^{ij}	69.10 ^{gh}	73.20 ^l
Means ²	41.15 ^a	63.10 ^e	58.47 ^d	53.49 ^c	47.97 ^b	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 2.47, I/P = 1.48, P.I/P = 5.53] for Means ^{1,2,3} respectively.

12. The effects of P treatments and incubation periods on the total soil P (Total-P_i + Total-P_o) (TOT-P) of Rustenburg soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	1045116.21	80393.55	5893.82	<.01
INC/PER (I/P)	4	156966.81	39241.70	2876.89	<.01
PHOSP.INC/PER (P.I/P)	52	42480.92	816.94	59.89	<.01
REPS.	2	326.85	163.43	14.25	
Residual	140	1909.64	13.64		
Total	209	1246473.58			

SE = 3.69; CV = 1.2

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60	120 ³	180 ³	240 ³	
0	193.20 ^a	204.77 ^b	210.50 ^{bc}	207.25 ^{bc}	206.27 ^b	204.40 ^a
5	201.58 ^{ab}	211.34 ^{bc}	224.21 ^{cd}	221.92 ^c	217.35 ^c	215.28 ^b
10	205.65 ^b	235.29 ^d	240.82 ^{de}	248.17 ^{ef}	233.38 ^d	232.66 ^c
20	224.53 ^{cd}	250.67 ^{ef}	243.30 ^{de}	271.50 ^g	260.29 ^{fg}	250.06 ^d
25	224.53 ^{cd}	256.92 ^f	260.82 ^{fg}	279.77 ^h	280.55 ^h	260.52 ^e
50	245.67 ^e	275.71 ^{gh}	297.29 ^{ij}	307.72 ^j	308.25 ^j	286.93 ^f
75	254.49 ^{ef}	305.84 ^j	331.92 ^{kl}	335.25 ^{kl}	331.13 ^{kl}	311.73 ^g
100	275.25 ^{gh}	326.55 ^k	339.33 ^l	348.83 ^{lm}	347.85 ^{lm}	327.56 ^h
125	284.74 ^h	345.39 ^{lm}	351.91 ^m	364.83 ⁿ	373.17 ^{np}	344.01 ⁱ
150	294.43 ⁱ	356.82 ^{mn}	374.94 ^{np}	382.00 ^p	387.55 ^p	359.15 ^j
175	306.28 ^j	372.81 ^{np}	381.35 ^p	403.22 ^q	399.67 ^q	372.26 ^k
200	313.89 ^j	386.18 ^p	407.04 ^{qr}	425.67 ^{rs}	429.22 ^s	392.40 ^l
225	343.03 ^{lm}	405.41 ^q	417.00 ^q	443.75 ^t	445.07 ^t	410.85 ^m
250	358.49 ^{mn}	424.49 ^{rs}	429.50 ^s	463.75 ^u	460.66 ^u	427.38 ⁿ
Means ²	266.13 ^a	311.30 ^b	322.14 ^c	335.97 ^d	334.32 ^d	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 4.53, I/P = 2.71, P.I/P 10.14] for Means ^{1,2,3} respectively.

B: LOSKOP SOILS

13. The effects of P treatments and incubation period on the dialysis membrane tubes-hydrous ferric oxide (DMT-HFO) extractable P_i (DMT-HFO- P_i) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	15009.25	1154.56	1958.95	<.01
INC/PER (I/P)	4	6628.26	1657.06	2811.56	<.01
PHOSP.INC/PER (P.I/P)	52	2963.04	56.98	96.68	<.01
REPS.	2	6.57	3.28	5.97	
Residual	140	82.51	0.59		
Total	209	24683.07			

SE = 0.78; CV = 4.8

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					
	1 ³	60 ³	120 ³	180 ³	240 ³	Means ¹
0	5.40 ^{ab}	5.25 ^{ab}	5.35 ^{ab}	4.92 ^{ab}	4.54 ^a	5.09 ^a
5	8.67 ^{bc}	5.79 ^{ab}	5.49 ^{ab}	5.21 ^{ab}	4.63 ^a	5.96 ^{ab}
10	9.33 ^c	5.79 ^{ab}	5.75 ^{ab}	5.50 ^{ab}	5.00 ^{ab}	6.27 ^b
20	10.00 ^c	6.46 ^{ab}	6.29 ^{ab}	6.04 ^{ab}	5.42 ^{ab}	6.84 ^{bc}
25	10.67 ^{cd}	7.50 ^{bc}	7.09 ^b	6.84 ^b	6.46 ^{ab}	7.71 ^c
50	18.56 ^{fg}	10.71 ^{cd}	7.96 ^{bc}	8.92 ^{bc}	7.21 ^b	10.67 ^d
75	26.00 ⁱ	14.67 ^{ef}	14.25 ^e	12.09 ^d	10.19 ^{cd}	15.44 ^e
100	39.33 ^m	22.08 ^h	15.58 ^{ef}	14.33 ^e	11.50 ^d	19.36 ^f
125	40.22 ^{mn}	25.33 ⁱ	17.08 ^{fg}	15.83 ^{ef}	14.28 ^e	24.15 ^g
150	41.89 ⁿ	28.33 ^j	19.00 ^g	17.75 ^{fg}	15.57 ^{ef}	27.31 ^h
175	51.33 ^p	30.00 ^j	21.00 ^{gh}	19.20 ^g	15.92 ^{ef}	30.49 ⁱ
200	64.78 ^q	33.58 ^k	23.08 ^{hi}	19.58 ^g	16.75 ^f	31.95 ^j
225	67.00 ^r	36.25 ^l	23.67 ^{hi}	20.58 ^{gh}	17.00 ^{fg}	32.90 ^k
250	68.11 ^r	38.08 ^{lm}	25.17 ⁱ	21.08 ^{gh}	17.25 ^{fg}	33.94 ^l
Means ²	32.95 ^e	19.27 ^d	14.05 ^c	12.78 ^b	10.84 ^a	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 0.94, I/P = 0.56, P.I/P = 2.11] for Means ^{1,2,3} respectively.

14. The effects of P treatments and incubation period on the 0.5M NaHCO₃ extractable inorganic P (-HCO₃-P_i) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	32533.20	2502.55	3717.02	<.01
INC/PER (I/P)	4	10240.51	2560.13	3802.54	<.01
PHOSP.INC/PER (P.I/P)	52	3037.63	58.41	86.76	<.01
REPS.	2	5.46	2.73	4.25	
Residual	140	94.26	0.67		
Total	209	45905.60			

SE = 0.82; CV = 3.9

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	12.83 ^d	8.11 ^{bc}	6.89 ^{ab}	6.00 ^{ab}	5.56 ^{ab}	7.88 ^a
5	13.23 ^{de}	8.55 ^{bc}	7.00 ^{ab}	6.33 ^{ab}	5.11 ^a	8.04 ^{ab}
10	13.44 ^{de}	9.00 ^{bc}	7.22 ^{ab}	6.92 ^{ab}	5.56 ^{ab}	8.43 ^{ab}
20	13.84 ^{de}	9.83 ^c	7.42 ^b	7.17 ^{ab}	6.44 ^{ab}	8.94 ^b
25	17.76 ^f	10.92 ^{cd}	9.67 ^{bc}	7.62 ^{bc}	6.89 ^{ab}	10.57 ^c
50	30.08 ⁱ	15.42 ^e	13.42 ^{de}	8.13 ^{bc}	7.67 ^{bc}	14.94 ^d
75	38.02 ^k	16.25 ^{ef}	14.58 ^{de}	10.63 ^{cd}	9.50 ^{bc}	17.80 ^e
100	45.12 ^m	28.83 ⁱ	25.21 ^h	16.00 ^{ef}	13.17 ^{de}	25.67 ^f
125	52.38 ^p	37.22 ^k	30.42 ⁱ	19.63 ^{fg}	14.33 ^{de}	30.80 ^g
150	59.29 ^q	40.28 ^l	33.46 ^j	22.00 ^{gh}	18.83 ^{fg}	34.77 ^h
175	61.84 ^r	46.00 ^m	37.58 ^k	23.17 ^h	20.17 ^g	37.75 ⁱ
200	74.95 ^s	49.03 ⁿ	41.75 ^l	28.92 ⁱ	23.17 ^h	43.56 ^j
225	82.76 ^t	51.25 ^{np}	45.83 ^m	39.25 ^{kl}	37.67 ^k	51.35 ^k
250	84.42 ^t	51.25 ^{np}	46.80 ^{mn}	41.38 ^l	37.92 ^k	52.35 ^k
Means ²	42.85 ^e	27.28 ^d	23.38 ^c	17.37 ^b	15.14 ^a	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.01, I/P = 0.60, P.I/P = 2.25] for Means ^{1,2,3} respectively.

15. The effects of P treatments and incubation period on the 0.5M NaHCO₃ extractable organic P (-HCO₃-P_o) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	1916.26	147.40	170.68	<.01
INC/PER (I/P)	4	577.15	144.29	167.07	<.01
PHOSP.INC/PER (P.I/P)	52	255.99	4.92	5.70	<.01
REPS.	2	0.18	0.092	0.11	
Residual	140	120.91	0.86		
Total	209	2870.31			

SE = 0.93; CV = 7.0

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIODS (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	9.55 ^{ab}	10.00 ^{ab}	10.25 ^{ab}	8.50 ^{ab}	7.83 ^a	9.23 ^a
5	9.63 ^{ab}	10.75 ^b	11.08 ^{bc}	8.25 ^{ab}	8.08 ^{ab}	9.56 ^{ab}
10	10.05 ^{ab}	10.79 ^b	12.39 ^{bc}	8.59 ^{ab}	8.25 ^{ab}	10.01 ^{ab}
20	10.28 ^{ab}	10.75 ^b	12.17 ^{bc}	9.21 ^{ab}	8.83 ^{ab}	10.25 ^{ab}
25	10.28 ^{ab}	11.42 ^{bc}	12.48 ^{bc}	10.21 ^{ab}	8.83 ^{ab}	10.65 ^b
50	10.54 ^b	12.88 ^{bc}	13.55 ^c	11.75 ^{bc}	10.92 ^b	11.33 ^b
75	10.98 ^b	15.58 ^{cd}	14.21 ^{cd}	13.79 ^{cd}	11.50 ^{bc}	13.21 ^c
100	11.33 ^{bc}	16.08 ^{cd}	16.25 ^d	13.79 ^{cd}	12.25 ^{bc}	13.94 ^{cd}
125	11.32 ^{bc}	16.33 ^{de}	17.50 ^{de}	14.63 ^{cd}	13.63 ^c	14.68 ^d
150	11.35 ^{bc}	17.30 ^{de}	17.92 ^{de}	15.09 ^{cd}	14.00 ^{cd}	15.13 ^d
175	11.58 ^{bc}	17.38 ^{de}	18.17 ^{de}	15.88 ^{cd}	15.58 ^{cd}	15.72 ^{de}
200	12.18 ^{bc}	20.30 ^{ef}	18.84 ^e	15.88 ^{cd}	15.67 ^{cd}	16.57 ^e
225	13.70 ^{cd}	20.38 ^{ef}	18.96 ^e	17.92 ^{de}	16.08 ^{cd}	17.41 ^{ef}
250	14.12 ^{cd}	22.75 ^f	19.37 ^e	18.42 ^{de}	16.41 ^{de}	18.21 ^f
Means ²	10.99 ^a	15.19 ^d	15.23 ^d	12.99 ^c	11.99 ^b	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.14, I/P = 0.68, P.I/P = 2.55] for Means ^{1,2,3} respectively.

16. The effects of added P and incubation period on the 0.1M NaOH-extractable inorganic P (-OH-P_i) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	67318.85	5178.37	3021.60	<.01
INC/PER (I/P)	4	32566.07	8141.52	4750.60	<.01
PHOSP.INC/PER (P.I/P)	52	8692.11	167.16	97.54	<.01
REPS.	2	4.55	2.27	1.33	
Residual	140	239.93	1.71		
Total	209	108816.96			

SE = 1.31; CV = 2.4

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	21.43 ^a	26.42 ^b	31.17 ^c	34.92 ^d	37.83 ^{de}	30.35 ^a
5	23.83 ^{ab}	26.67 ^b	31.67 ^{cd}	34.97 ^d	37.97 ^{de}	31.02 ^a
10	23.80 ^{ab}	26.83 ^b	35.83 ^d	35.00 ^d	38.17 ^{de}	31.93 ^a
20	25.80 ^b	28.75 ^{bc}	36.50 ^{de}	36.00 ^{de}	42.83 ^{ef}	33.98 ^b
25	27.10 ^b	32.17 ^{cd}	37.50 ^{de}	40.17 ^e	45.33 ^f	36.45 ^c
50	39.43 ^e	46.33 ^{fg}	54.33 ^h	61.50 ^{ij}	65.50 ^{jk}	53.42 ^d
75	41.77 ^{ef}	49.00 ^g	60.50 ⁱ	68.42 ^k	70.00 ^{kl}	57.94 ^e
100	45.57 ^{fg}	52.83 ^h	62.17 ^{ij}	72.58 ^l	78.58 ^{mn}	62.35 ^f
125	50.73 ^{gh}	64.50 ^j	72.17 ^l	77.00 ^{mn}	83.33 ^{np}	69.55 ^g
150	54.80 ^h	65.83 ^{jk}	73.33 ^{lm}	83.17 ^{np}	87.83 ^{pq}	72.99 ^h
175	60.97 ^{ij}	66.33 ^{jk}	76.33 ^m	86.33 ^{pq}	90.07 ^q	76.01 ⁱ
200	62.23 ^{ij}	73.25 ^{lm}	84.67 ^p	89.50 ^q	96.07 ^{rs}	81.14 ^j
225	68.00 ^{jk}	80.33 ⁿ	85.83 ^p	93.97 ^r	98.67 ^s	85.36 ^k
250	70.30 ^{kl}	81.08 ^{np}	86.83 ^{pq}	96.75 ^{rs}	103.90 ^t	87.77 ^l
Means ²	43.98 ^a	51.45 ^b	59.20 ^c	65.02 ^d	66.72 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.60, I/P = 0.96, P.I/P = 3.59] for Means ^{1,2,3} respectively.

17. The effects of P treatments and incubation period on the 0.1M NaOH extractable organic P (-OH-P_o) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	3007.22	231.32	406.11	<.01
INC/PER (I/P)	4	2445.34	611.33	1073.25	<.01
PHOSP.INC/PER (P.I/P)	52	993.62	19.11	33.55	<.01
REPS.	2	0.20	0.10	0.17	
Residual	140	79.74	0.57		
Total	209	6525.92			

SE = 0.75; CV = 5.0

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIODS (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	7.38 ^a	9.81 ^b	10.17 ^{bc}	11.38 ^{bc}	11.58 ^{bc}	10.06 ^{ab}
5	7.55 ^{ab}	9.88 ^b	11.08 ^{bc}	10.83 ^{bc}	9.83 ^b	9.83 ^a
10	7.70 ^{ab}	9.88 ^b	11.50 ^{bc}	11.25 ^{bc}	10.79 ^{bc}	10.22 ^{ab}
20	8.70 ^{ab}	10.29 ^{bc}	13.00 ^{cd}	11.25 ^{bc}	10.92 ^{bc}	10.83 ^b
25	8.48 ^{ab}	11.96 ^c	13.50 ^{cd}	13.57 ^{cd}	13.18 ^{cd}	12.14 ^c
50	8.85 ^{ab}	13.00 ^{cd}	14.71 ^{de}	14.86 ^{de}	14.50 ^d	13.18 ^d
75	9.58 ^b	13.42 ^{cd}	14.79 ^{de}	15.25 ^{de}	15.13 ^{de}	13.63 ^d
100	10.12 ^{bc}	13.71 ^{cd}	16.42 ^{de}	17.40 ^{ef}	16.13 ^{de}	14.76 ^e
125	10.20 ^{bc}	14.75 ^{de}	16.67 ^e	18.08 ^{ef}	16.92 ^{ef}	15.32 ^{ef}
150	10.30 ^{bc}	15.71 ^{de}	18.33 ^{ef}	18.92 ^f	17.13 ^{ef}	16.08 ^f
175	10.15 ^{bc}	16.09 ^{de}	18.46 ^{ef}	19.33 ^f	18.97 ^f	16.60 ^{fg}
200	10.35 ^{bc}	16.13 ^{de}	19.83 ^{fg}	20.67 ^{fg}	20.09 ^f	17.21 ^g
225	10.97 ^{bc}	17.34 ^{ef}	22.75 ^{gh}	23.04 ^{gh}	21.79 ^g	19.18 ^h
250	11.32 ^{bc}	18.13 ^{ef}	23.92 ^h	23.88 ^h	22.77 ^g	20.00 ^h
Means ²	9.40 ^a	13.58 ^b	16.08 ^c	16.41 ^d	15.62 ^c	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD [P = 0.93, I/P = 0.55, P.I/P = 2.07] for Means ^{1,2,3} respectively.

18. The effects of P treatments and incubation period on the 1M HCl extractable Ca - bound P_i (D/HCl-P_i) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	1385.63	106.59	252.64	<.01
INC/PER (I/P)	4	457.51	114.38	271.11	<.01
PHOSP.INC/PER (P.I/P)	52	141.62	2.72	6.46	<.01
REPS.	2	0.96	0.48	1.14	
Residual	140	59.06	0.42		
Total	209	2043.83			

SE = 0.65; CV = 6.0

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	5.97 ^a	5.99 ^a	6.17 ^{ab}	6.25 ^{ab}	6.08 ^{ab}	6.09 ^a
5	6.23 ^{ab}	6.79 ^{ab}	7.50 ^{ab}	8.33 ^{bc}	7.83 ^b	7.34 ^b
10	6.47 ^{ab}	6.96 ^{ab}	9.25 ^{bc}	9.21 ^{bc}	8.50 ^{bc}	8.08 ^{bc}
20	7.30 ^{ab}	7.04 ^{ab}	9.17 ^{bc}	9.67 ^c	8.83 ^{bc}	8.60 ^c
25	7.50 ^{ab}	8.95 ^{bc}	9.43 ^{bc}	10.15 ^{cd}	11.33 ^{cd}	9.48 ^d
50	8.00 ^{bc}	9.13 ^{bc}	10.22 ^{cd}	11.18 ^{cd}	11.67 ^d	10.04 ^{de}
75	8.93 ^{bc}	9.67 ^c	11.21 ^{cd}	11.38 ^{cd}	11.79 ^d	10.60 ^e
100	9.28 ^{bc}	10.14 ^{cd}	11.70 ^d	12.06 ^d	12.92 ^{de}	11.22 ^{ef}
125	9.40 ^{bc}	10.79 ^{cd}	11.80 ^d	14.29 ^e	12.81 ^{de}	11.62 ^f
150	9.93 ^{cd}	10.63 ^{cd}	12.13 ^d	14.58 ^e	16.07 ^{ef}	12.67 ^g
175	10.02 ^{cd}	10.75 ^{cd}	12.75 ^{de}	15.00 ^{ef}	16.75 ^f	13.06 ^{gh}
200	10.43 ^{cd}	12.96 ^d	13.25 ^{de}	14.67 ^{ef}	16.42 ^f	13.55 ^h
225	10.73 ^{cd}	12.64 ^{de}	14.73 ^{ef}	15.46 ^{ef}	16.63 ^f	14.03 ^h
250	11.97 ^d	12.83 ^{de}	15.75 ^{ef}	16.88 ^f	17.50 ^f	14.99 ⁱ
Means ²	8.73 ^a	9.66 ^b	11.15 ^c	12.08 ^d	12.51 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 0.80, I/P = 0.48, P.I/P = 1.78] for Means ^{1,2,3} respectively.

19. The effects of added P and incubation period on the conc. HCl digestible inorganic P (C/HCl-P_i) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	19898.28	1530.64	637.69	<.01
INC/PER (I/P)	4	9436.47	2359.12	982.85	<.01
PHOSP.INC/PER (P.I/P)	52	5076.66	97.63	40.67	<.01
REPS.	2	25.91	12.95	5.76	
Residual	140	336.04	2.40		
Total	209	34747.45			

SE = 1.55; CV = 3.3

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIODS (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	29.33 ^a	31.50 ^{ab}	31.92 ^{ab}	32.33 ^{ab}	34.83 ^{bc}	31.98 ^a
5	31.73 ^{ab}	31.67 ^{ab}	33.83 ^b	33.08 ^{ab}	35.50 ^{bc}	33.16 ^a
10	32.27 ^{ab}	32.42 ^{ab}	34.67 ^{bc}	33.58 ^{ab}	35.83 ^{bc}	33.75 ^{ab}
20	32.27 ^{ab}	32.42 ^{ab}	35.50 ^{bc}	33.83 ^b	42.17 ^{cd}	35.24 ^b
25	32.27 ^{ab}	33.00 ^{ab}	38.58 ^{cd}	40.42 ^{cd}	42.42 ^{cd}	37.34 ^c
50	35.30 ^{bc}	35.08 ^{bc}	43.50 ^{de}	43.17 ^d	52.67 ^f	41.94 ^d
75	36.67 ^{bc}	40.08 ^c	45.42 ^{de}	52.58 ^f	54.67 ^{fg}	45.88 ^e
100	37.67 ^{bc}	41.58 ^c	47.75 ^e	53.67 ^{fg}	55.08 ^{fg}	47.15 ^e
125	38.20 ^c	42.17 ^c	52.67 ^f	53.17 ^{fg}	60.83 ^{gh}	49.41 ^f
150	38.53 ^{cd}	42.17 ^c	55.25 ^{fg}	60.25 ^{gh}	64.33 ^h	52.11 ^g
175	38.93 ^{cd}	43.92 ^{de}	58.83 ^g	61.33 ^{gh}	69.42 ⁱ	54.49 ^h
200	39.87 ^{cd}	48.42 ^{ef}	60.58 ^{gh}	65.63 ^{hi}	71.08 ⁱ	57.12 ⁱ
225	40.67 ^{cd}	57.25 ^g	67.17 ^{hi}	68.58 ^{hi}	76.42 ^j	62.02 ^j
250	42.60 ^d	60.25 ^{gh}	67.33 ^{hi}	75.50 ^j	87.92 ^k	66.72 ^k
Means ²	36.17 ^a	40.85 ^c	48.07 ^b	50.51 ^d	55.94 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.90, I/P = 1.14, P.I/P = 4.25] for Means ^{1,2,3} respectively.

20. The effects of P treatments and incubation period on the conc. HCl digestible organic P (C/HCl-P_o) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	1644.55	126.50	166.51	<.01
INC/PER (I/P)	4	1063.39	265.85	349.91	<.01
PHOSP.INC/PER (P.I/P)	52	444.04	8.54	11.24	<.01
REPS.	2	0.74	0.37	0.48	
Residual	140	106.37	0.76		
Total	209	3258.35			

SE = 0.87; CV = 6.5

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIODS (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	9.20 ^{ab}	8.78 ^a	9.94 ^{ab}	9.28 ^{ab}	9.39 ^{ab}	9.32 ^a
5	9.02 ^{ab}	8.89 ^{ab}	10.97 ^{ab}	9.69 ^{ab}	8.95 ^a	9.50 ^{ab}
10	9.11 ^{ab}	9.06 ^{ab}	10.72 ^{ab}	9.72 ^{ab}	10.62 ^{ab}	9.85 ^{ab}
20	9.33 ^{ab}	9.72 ^{ab}	11.00 ^{ab}	10.11 ^{ab}	12.33 ^b	10.50 ^b
25	9.96 ^{ab}	10.11 ^{ab}	11.25 ^b	11.89 ^{bc}	13.39 ^b	11.32 ^{bc}
50	10.00 ^{ab}	10.78 ^{ab}	11.78 ^{bc}	13.11 ^{bc}	15.94 ^{cd}	12.32 ^c
75	10.00 ^{ab}	11.00 ^{ab}	11.83 ^{bc}	13.39 ^{bc}	17.50 ^d	12.74 ^c
100	10.18 ^{ab}	11.61 ^{bc}	13.72 ^c	14.22 ^{cd}	20.05 ^e	13.96 ^d
125	10.44 ^{ab}	14.11 ^{cd}	13.78 ^c	15.27 ^{cd}	20.89 ^{ef}	14.90 ^{de}
150	10.71 ^{ab}	14.50 ^{cd}	14.06 ^{cd}	15.38 ^{cd}	21.22 ^{ef}	15.17 ^e
175	10.67 ^{ab}	14.72 ^{cd}	15.05 ^{cd}	16.63 ^d	22.28 ^{ef}	15.87 ^{ef}
200	11.78 ^{bc}	15.05 ^{cd}	15.89 ^{cd}	16.89 ^d	22.28 ^{ef}	16.38 ^f
225	12.69 ^{bc}	16.44 ^d	16.78 ^d	17.72 ^{de}	22.83 ^f	17.29 ^f
250	12.40 ^{bc}	15.83 ^d	17.17 ^d	17.42 ^d	23.17 ^f	17.20 ^f
Means ²	10.39 ^a	12.19 ^b	13.14 ^c	13.62 ^c	17.20 ^d	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 1.07, I/P = 0.64, P.I/P = 2.39] for Means ^{1,2,3} respectively.

21. The effects of added P and incubation periods on the conc. H₂SO₄ and H₂O₂ digestible P (H₂SO₄-P_i) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	22126.70	1702.05	464.53	<.01
INC/PER (I/P)	4	9565.23	2391.31	652.64	<.01
PHOSP.INC/PER (P.I/P)	52	5480.19	105.39	28.76	<.01
REPS.	2	5.11	2.55	0.69	
Residual	140	512.97	3.66		
Total	209	37685.08			

SE = 1.91; CV = 3.6

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIODS (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	39.83 ^a	40.67 ^{ab}	41.38 ^{ab}	41.97 ^{ab}	42.59 ^{ab}	41.29 ^a
5	39.87 ^a	41.00 ^{ab}	41.25 ^{ab}	42.01 ^{ab}	43.16 ^{ab}	41.46 ^a
10	39.93 ^{ab}	40.68 ^{ab}	41.36 ^{ab}	42.13 ^{ab}	43.33 ^{ab}	41.49 ^a
20	40.00 ^{ab}	40.92 ^{ab}	41.58 ^{ab}	42.29 ^{ab}	44.42 ^{ab}	41.84 ^a
25	40.00 ^{ab}	41.76 ^{ab}	41.80 ^{ab}	42.36 ^{ab}	44.27 ^{ab}	42.04 ^a
50	40.50 ^{ab}	41.92 ^{ab}	45.13 ^b	46.13 ^{bc}	54.78 ^{cd}	45.69 ^b
75	40.83 ^{ab}	51.13 ^c	49.95 ^{bc}	46.68 ^{bc}	58.93 ^{de}	49.50 ^c
100	41.00 ^{ab}	52.03 ^c	52.25 ^{cd}	57.59 ^d	60.16 ^{de}	52.61 ^d
125	42.17 ^{ab}	53.07 ^{cd}	54.77 ^{cd}	60.36 ^{de}	69.04 ^{ef}	55.88 ^e
150	42.50 ^{ab}	57.35 ^d	59.69 ^{de}	61.15 ^{de}	71.40 ^f	58.42 ^f
175	43.00 ^{ab}	63.90 ^e	66.49 ^{ef}	61.45 ^{de}	79.03 ^g	62.77 ^g
200	45.67 ^b	66.17 ^{ef}	70.48 ^f	71.45 ^f	79.82 ^g	66.72 ^h
225	45.67 ^b	66.71 ^{ef}	70.86 ^f	79.61 ^g	86.59 ^h	69.89 ⁱ
250	48.33 ^{bc}	66.90 ^{ef}	71.85 ^f	79.82 ^g	89.40 ^h	70.06 ⁱ
Means ²	42.09 ^a	51.37 ^b	53.49 ^c	55.36 ^d	61.49 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 2.35, I/P = 1.40, P.I/P = 5.25] for Means ^{1,2,3} respectively.

22. The effects of P treatments and incubation period on the total inorganic P (HFO-P_i + HCO₃-P_i + OH-P_i + conc.HCl-P_i + conc.H₂SO₄-P_i) (TOT-P_i) of Loskop soil

(i). Analysis of variance

Source of variation	d.f. (m.v.)	s.s.	m.s.	F	F pr.
PHOSP (P)	13	771096.22	59315.09	7124.82	<.01
INC/PER (I/P)	4	45583.95	11395.99	1368.86	<.01
PHOSP.INC/PER (P.I/P)	52	16789.68	322.88	38.78	<.01
REPS.	2	120.90	60.45	7.97	
Residual	138 (2)	1148.87	8.32		
Total	207 (2)	829352.68			

SE = 2.88; CV = 1.4

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIODS (DAYS)					
	1 ³	60 ³	120 ³	180 ³	240 ³	Means ¹
0	116.82 ^a	117.93 ^{ab}	122.87 ^b	123.40 ^{ab}	124.44 ^{ab}	121.09 ^a
5	123.37 ^{ab}	121.47 ^{ab}	126.75 ^{bc}	128.63 ^{bc}	130.90 ^{bc}	126.22 ^b
10	125.64 ^b	124.69 ^{ab}	134.08 ^d	131.35 ^{bc}	136.99 ^c	130.55 ^c
20	131.41 ^{bc}	129.43 ^{bc}	141.46 ^e	135.41 ^c	152.11 ^d	137.96 ^d
25	138.29 ^{cd}	137.30 ^c	145.62 ^e	152.56 ^d	163.70 ^{ef}	147.49 ^e
50	151.78 ^d	160.59 ^e	169.56 ^h	180.01 ^g	196.50 ^h	171.69 ^f
75	172.22 ^{fg}	180.80 ^g	195.92 ^k	197.77 ^h	209.08 ⁱ	191.16 ^g
100	184.97 ^g	203.51 ^{hi}	217.66 ⁿ	230.24 ^{kl}	246.41 ^m	216.56 ^h
125	203.10 ^{hi}	216.08 ^{ij}	233.90 ^{qr}	240.28 ^{lm}	254.63 ⁿ	229.60 ⁱ
150	217.95 ^j	229.93 ^k	237.86 ^r	246.90 ^{mn}	271.64 ^{pq}	240.86 ^j
175	221.09 ^j	254.11 ^{mn}	250.91 ^{tu}	261.49 ^{np}	287.35 ^{rs}	254.99 ^k
200	229.93 ^k	265.41 ^p	273.82 ^w	282.75 ^r	294.07 ^s	269.20 ^l
225	242.82 ^{lm}	284.42 ^r	285.08 ^x	297.40 ^s	322.96 ^u	286.54 ^m
250	249.73 ^{mn}	290.40 ^{rs}	293.74 ^{yz}	311.40 ^t	337.89 ^v	296.63 ⁿ
Means ²	179.22 ^a	194.00 ^b	202.09 ^c	208.54 ^d	223.48 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 3.54, I/P = 2.12, P.I/P = 7.92] for Means ^{1,2,3} respectively.

23. The effects of P treatments and incubation period on the total organic P ($\text{HCO}_3\text{-P}_o + \text{OH-P}_o + \text{conc. HCl-P}_o$) (TOT-P_o) of Loskop soil

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	13	18910.03	1454.62	696.21	<.01
INC/PER (I/P)	4	7809.18	1952.29	934.41	<.01
PHOSP.INC/PER (P.I/P)	52	3106.74	59.74	28.60	<.01
REPS.	2	0.25	0.13	0.06	
Residual	140	292.51	2.09		
Total	209	30118.46			

SE = 1.45; CV = 3.4

(ii). Table of means

PHOSPH LEVELS (mg kg^{-1})	INCUBATION PERIODS (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	26.13 ^a	28.59 ^{ab}	30.36 ^b	29.16 ^{ab}	28.80 ^{ab}	28.61 ^a
5	26.21 ^a	29.52 ^{ab}	33.14 ^{bc}	29.78 ^{ab}	28.86 ^{ab}	29.50 ^a
10	26.86 ^{ab}	29.72 ^{ab}	34.62 ^c	29.56 ^{ab}	29.66 ^{ab}	30.09 ^a
20	28.31 ^{ab}	30.77 ^{bc}	36.17 ^{cd}	30.57 ^b	36.09 ^{cd}	32.38 ^b
25	28.72 ^{ab}	33.49 ^{bc}	37.23 ^{cd}	36.67 ^{cd}	37.41 ^{cd}	34.70 ^c
50	29.39 ^{ab}	36.65 ^{cd}	40.03 ^d	40.73 ^{de}	45.36 ^{ef}	38.43 ^d
75	30.48 ^b	40.01 ^d	40.83 ^{de}	44.43 ^e	49.13 ^f	40.98 ^e
100	31.63 ^{bc}	41.41 ^{de}	46.39 ^{ef}	47.41 ^{ef}	52.43 ^{fg}	43.85 ^f
125	31.56 ^{bc}	45.19 ^{ef}	47.95 ^{ef}	49.38 ^f	55.44 ^g	45.90 ^g
150	32.06 ^{bc}	47.51 ^{ef}	49.31 ^f	50.39 ^f	57.35 ^{gh}	47.33 ^{gh}
175	32.40 ^{bc}	48.19 ^{ef}	51.68 ^{fg}	51.55 ^{fg}	59.83 ^h	48.73 ^h
200	34.31 ^{bc}	51.48 ^{fg}	54.55 ^g	56.44 ^{gh}	64.03 ⁱ	52.16 ⁱ
225	37.35 ^{cd}	54.15 ^{fg}	58.49 ^{gh}	62.68 ^{hi}	66.71 ^{ij}	55.88 ^j
250	37.84 ^{cd}	56.71 ^{fg}	60.45 ^{hi}	63.72 ^{hi}	70.34 ^j	57.81 ^k
Means ²	30.95 ^a	40.96 ^b	44.37 ^c	44.46 ^c	48.67 ^d	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P = 1.77$, I/P = 1.06, P.I/P = 3.97] for Means ^{1,2,3} respectively.

24. The effects of P treatments and incubation period on the total soil P (Total P_i + Total P_o) (TOT-P) of Loskop soil

(i). Analysis of variance

Source of variation	d.f. (m.v.)	s.s.	m.s.	F	F pr.
PHOSP (P)	13	1.03E+06	7.91E+04	8023.78	<.01
INC/PER (I/P)	4	8.83E+04	2.21E+04	2239.38	<.01
PHOSP.INC/PER (P.I/P)	52	3.25E+04	6.25E+02	63.39	<.01
REPS.	2	1.46E+02	7.28E+01	8.14	
Residual	139 (1)	1.37E+03	9.85E+00		
Total	208 (1)	1.15E+06			

SE = 3.14; CV = 1.3

(ii). Table of means

PHOSPH LEVELS (mg kg ⁻¹)	INCUBATION PERIOD (DAYS)					Means ¹
	1 ³	60 ³	120 ³	180 ³	240 ³	
0	142.95 ^a	146.52 ^{ab}	153.23 ^b	152.55 ^b	153.24 ^b	149.70 ^a
5	149.57 ^{ab}	150.99 ^{ab}	159.88 ^{bc}	157.41 ^{bc}	157.77 ^{bc}	155.13 ^b
10	152.50 ^b	154.41 ^b	168.70 ^c	160.91 ^{bc}	166.65 ^c	160.63 ^c
20	159.72 ^{bc}	160.19 ^b	177.63 ^d	165.98 ^c	188.20 ^e	170.34 ^d
25	167.01 ^c	170.79 ^{cd}	182.85 ^{de}	189.23 ^{ef}	201.10 ^{fg}	182.20 ^e
50	178.17 ^d	197.24 ^f	209.59 ^g	220.74 ^h	241.86 ^{ij}	209.52 ^f
75	202.70 ^{fg}	220.81 ^h	236.75 ^{ij}	242.20 ^{ij}	258.20 ^k	232.13 ^g
100	216.60 ^{gh}	244.92 ^j	264.05 ^k	277.65 ^l	298.84 ⁿ	260.41 ^h
125	234.66 ⁱ	261.27 ^k	281.85 ^{lm}	289.66 ^{mn}	310.07 ^p	275.50 ⁱ
150	253.08 ^{jk}	277.45 ^l	287.17 ^m	297.29 ⁿ	328.99 ^q	288.80 ^j
175	253.49 ^{jk}	298.09 ⁿ	298.66 ⁿ	313.04 ^p	347.18 ^{rs}	302.09 ^k
200	264.24 ^k	316.90 ^p	328.37 ^q	339.19 ^r	358.11 ^s	321.36 ^l
225	280.18 ^{lm}	338.57 ^r	343.57 ^r	360.09 ^s	389.67 ^u	342.42 ^m
250	287.57 ^m	347.11 ^{rs}	354.19 ^s	375.12 ^t	408.23 ^v	354.44 ⁿ
Means ²	210.17 ^a	234.66 ^b	246.18 ^c	252.93 ^d	272.01 ^e	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P = 3.85, I/P = 2.30, P.I/P = 8.62] for Means ^{1,2,3} respectively.



25. An example of Genstat 5 Release 4.1 computer programme used in the statistical analysis of Rustenburg and Loskop soils data.

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1 JOB 'PHOSPHORUS BINDING IN RUSTENBURG RED CLAY'
2 "ON NETWORK H:\HOME\VICTOR as XRUST.DAT; XRUST.OUT"
3 UNITS [NVALUES=210]
4
5                                     FACTOR
[LEVEL=14;LABEL=!T(P0,'P6.25','P12.5','P18.75',P25,P50,P75,P100,P125
,\
5         P150,P175,P200,P225,P250)] PHOSP
6 FACTOR [LEVELS=5;LABEL=!T(DAY1,DAY60,DAY120,DAY180,DAY240)] TIME
7 FACTOR [LEVELS=3] REPS
8 OPEN 'A:XRUST.DAT';WIDTH=160;FILETYPE=INPUT;CHAN=4
9
9                                     READ[CHAN=4]
BOT,PHOSP,REPS,BL,TIME,HFOpI,HCOpI,OHpI,DHClpI,CHClpI,HSOpI,\
10 HCOpT,OHpT,CHClpT,HCOpO,OHpO,CHClpO,TOTpO,TOTpI,TOTp
  Identifier      Minimum      Mean      Maximum      Values      Missing
      BOT          1.0         105.5      210.0         210          0
      BL          1.000        9.257      18.000         210          0
      HFOpI        2.19         12.12      43.70          210          0
      HCOpI        2.75         16.97      58.13          210          0
      OHpI         33.00        68.31     108.00          210          0
      DHClpI       6.15         17.99      33.00          210          0
      CHClpI      27.00         74.89     108.06          210          0
      HSOpI       49.50         69.86     108.50          210          0
      HCOpT        7.00         30.33      75.60          210          0
      OHpT        46.80         90.31     143.25          210          0
      CHClpT      41.00         92.41     138.00          210          0
      HCOpO        3.75         13.36      26.50          210          0
      OHpO         6.50         21.99      40.38          210          0
      CHClpO      10.00         17.52      31.00          210          0
      TOTpO       22.96         52.88      87.88          210          0
      TOTpI      155.5         260.1     393.7           210          0
      TOTp       188.3         313.0     468.0           210          0
  Identifier      Values      Missing      Levels
      PHOSP        210         0           14
      REPS         210         0           3
      TIME         210         0           5
11 BLOCK REPS.PHOSP.TIME
12 TREAT PHOSP*TIME
13 FOR Y=HFOpI,HCOpI,OHpI,DHClpI,CHClpI,HSOpI,OHpT,CHClpT,\
14     HCOpT,HCOpO,OHpO,CHClpO,TOTpO,TOTpI,TOTp
15
15                                     ANOVA
[PRINT=AOVTABLE,INFO,MEANS,%CV;FPROB=YES;PSE=LSD,MEAN;LSDLEVEL=0.1]
Y;\
16 RESIDUALS=RES;FITTEDVALUES=FIT
17 AKEEP TERMS=PHOSP.TIME;VARIANCE=V1
18 CALC ST_RES=RES/(SQRT(VAR(RES)))
19 GRAPH [NROWS=10;NCOL=25] ST_RES;FIT
20 HIST ST_RES
21 PRINT 'TEST FOR NORMALITY'
22 NORMTEST [PRINT=m,s,c] ST_RES
23 PRINT 'TEST HOMOGENEITY'
24 VHOMOGENITY [GROUPS=PHOSP] Y
25 VHOMOGENITY [GROUPS=TIME] Y
26 PRINT BOT,PHOSP,REPS,TIME,Y,FIT,ST_RES;DECI=4(0),2(3),4;FIELD=11
27 ENDFOR

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APPENDICES II

A: RUSTENBURG SOIL

1. The effects of DMT-HFO extractions on the extractable solution P of Rustenburg soil as influenced by the added P, and the incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	50165.28	12541.32	9489.41	<.01
INC/PER (I/P)	2	11301.64	5650.82	4275.70	<.01
EX/TIME (E/T)	4	21064.26	5266.07	3984.57	<.01
PHOSP.INC/PER (P.I/P)	8	5822.84	727.86	550.73	<.01
PHOSP.EX/TIME (P.E/T)	16	5378.68	336.17	254.36	<.01
INCPER.EX/TIME (I.E/T)	8	472.62	59.08	44.70	<.01
PHOSP.INC/PER.EX/TIME	32	493.72	15.43	11.67	<.01
REPS	2	3.602	1.801	1.37	
Residual	150	198.24	1.32		
Total	224	94897.29			

SE = 1.15; CV = 4.7

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS Days	INCUBATION PERIOD (DAYS)			Means ³
		1 ²	120 ²	240 ²	
0	1	3.22 ^{ab}	3.25 ^{ab}	2.85 ^a	3.11 ^a
	7	6.24 ^b	5.05 ^{ab}	4.50 ^{ab}	5.26 ^b
	14	7.77 ^{bc}	6.33 ^b	5.53 ^{ab}	6.54 ^b
	28	10.70 ^{cd}	7.15 ^{bc}	6.87 ^{bc}	8.24 ^c
	56	12.18 ^{cd}	10.42 ^c	8.92 ^{bc}	9.81 ^{cd}
Means ¹		8.01 ^b	6.04 ^a	5.73 ^a	
25	1	7.50 ^{bc}	3.52 ^{ab}	4.30 ^{ab}	5.11 ^b
	7	11.93 ^{cd}	7.17 ^{bc}	5.70 ^{ab}	8.27 ^c
	14	13.97 ^d	12.28 ^{cd}	7.25 ^{bc}	11.17 ^d
	28	24.47 ^g	17.33 ^e	9.70 ^c	17.17 ^f
	56	28.50 ^h	23.52 ^{fg}	12.40 ^{cd}	21.47 ^g
Means ¹		17.27 ^d	12.76 ^c	7.87 ^b	
50	1	17.92 ^{ef}	6.97 ^{bc}	5.27 ^{ab}	10.05 ^{cd}
	7	21.00 ^f	12.83 ^{cd}	10.92 ^{cd}	14.92 ^e
	14	26.73 ^{gh}	21.12 ^f	15.25 ^{de}	21.03 ^g
	28	31.77 ⁱ	25.78 ^{gh}	20.93 ^f	26.16 ^h
	56	38.75 ^j	34.47 ^{ij}	25.60 ^{gh}	32.94 ⁱ
Means ¹		27.23 ^f	20.23 ^e	15.59 ^d	

100	1	26.57 ^{gk}	11.38 ^{uv}	8.17 ^{bc}	15.37 ^e
	7	35.72 ^j	21.52 ^{fg}	15.00 ^{de}	24.08 ^h
	14	45.18 ^{kl}	32.53 ⁱ	19.85 ^{ef}	32.52 ⁱ
	28	52.68 ^m	42.25 ^{kl}	27.47 ^{gh}	40.80 ^j
	56	65.00 ^p	52.83 ^m	36.13 ^j	51.32 ^k
Means ¹		45.03 ^h	32.10 ^g	21.32 ^e	
200	1	46.18 ^l	21.63 ^{fg}	14.62 ^{de}	27.48 ^h
	7	61.50 ⁿ	36.38 ^j	23.13 ^{fg}	40.34 ^j
	14	72.85 ^q	45.30 ^l	31.50 ^{hi}	49.88 ^k
	28	81.23 ^r	60.02 ⁿ	42.08 ^k	61.11 ^l
	56	96.77 ^s	74.73 ^q	53.63 ^m	75.04 ^m
Means ¹		71.71 ^j	47.61 ⁱ	32.99 ^g	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.41$, $P.I/P.E/T = 3.15$, $P.E/T = 1.82$] for Means^{1,2,3} respectively

2. The effects of DMT-HFO extractions on the bicarbonate extracted inorganic ($-HCO_3-P_i$) of Rustenburg soil as influenced by the added P, and the incubation period

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	15679.07	3919.77	5893.11	<.01
INC/PER (I/P)	2	13316.45	6658.22	1.0E+04	<.01
EX/TIME (E/T)	4	1955.77	488.94	735.09	<.01
PHOSP.INC/PER (P.I/P)	8	7903.72	987.97	1485.34	<.01
PHOSP.EX/TIME (P.E/T)	16	836.51	52.28	78.60	<.01
INCPER.EX/TIME (I.E/T)	8	707.47	88.43	132.96	<.01
PHOSP.INC/PER.EX/TIME	32	268.61	8.39	12.62	<.01
REPS	2	0.33	0.16	0.24	
Residual	150	99.77	0.67		
Total	224	40767.36			

SE = 0.82; CV = 6.3

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			Means ³
		Days	1 ²	120 ²	
0	1	7.00 ^{cd}	3.97 ^{ab}	2.80 ^{ab}	4.59 ^{bc}
	7	6.50 ^{bc}	3.27 ^{ab}	2.77 ^{ab}	4.18 ^b
	14	5.30 ^{bc}	3.07 ^{ab}	2.72 ^{ab}	3.70 ^{ab}
	28	4.30 ^b	2.93 ^{ab}	2.67 ^{ab}	3.30 ^{ab}
	56	2.77 ^{ab}	2.60 ^{ab}	1.87 ^a	2.41 ^a
Means ¹		5.17 ^c	3.17 ^{ab}	2.57 ^a	
25	1	14.77 ^{fg}	6.22 ^{bc}	5.27 ^{bc}	8.75 ^e
	7	11.47 ^e	4.47 ^{bc}	4.33 ^{bc}	6.76 ^{cd}
	14	9.83 ^{de}	4.10 ^{ab}	3.33 ^{ab}	5.75 ^c
	28	5.10 ^{bc}	3.20 ^{ab}	3.00 ^{ab}	3.77 ^b
	56	3.65 ^{ab}	2.93 ^{ab}	2.30 ^{ab}	2.96 ^{ab}
Means ¹		8.96 ^e	4.18 ^b	3.65 ^b	
50	1	20.80 ^{hi}	9.50 ^{de}	7.97 ^{cd}	12.76 ^g
	7	18.83 ^h	7.60 ^{cd}	7.00 ^{cd}	11.14 ^f
	14	12.63 ^{ef}	6.10 ^{bc}	6.55 ^c	8.43 ^{de}
	28	11.60 ^{ef}	5.20 ^{bc}	5.50 ^{bc}	7.43 ^d
	56	8.80 ^d	5.33 ^{bc}	4.77 ^{bc}	6.30 ^{cd}
Means ¹		14.53 ^g	6.75 ^d	6.36 ^d	
100	1	33.40 ^k	14.58 ^{fg}	10.73 ^{de}	19.57 ⁱ
	7	27.13 ^j	10.93 ^{de}	9.67 ^{de}	15.91 ^h
	14	22.17 ⁱ	10.30 ^{de}	8.53 ^{cd}	13.67 ^g
	28	16.23 ^g	8.93 ^d	7.60 ^{cd}	10.92 ^f
	56	12.00 ^{ef}	8.20 ^{cd}	6.80 ^{cd}	9.00 ^e
Means ¹		22.19 ⁱ	10.59 ^f	8.67 ^e	
200	1	69.80 ^p	23.02 ⁱ	18.80 ^h	37.21 ^p
	7	48.27 ⁿ	19.77 ^h	14.33 ^{fg}	27.46 ⁿ
	14	45.17 ^m	14.97 ^{fg}	13.83 ^f	24.66 ^m
	28	38.00 ^l	12.20 ^{ef}	11.57 ^e	20.59 ^l
	56	27.33 ^j	11.27 ^e	9.13 ^{de}	15.91 ^j
Means ¹		45.71 ^j	16.25 ^h	13.53 ^g	

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P.I/P = 1.00, P.I/P.E/T = 2.24, P.E/T = 1.29] for Means^{1,2,3} respectively.

3. The effects of DMT-HFO extractions on the hydroxide extracted inorganic P (-OH-P_i) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	73527.43	18381.86	1.11E+04	<.01
INC/PER (I/P)	2	26171.31	13085.66	7906.32	<.01
EX/TIME (E/T)	4	21487.28	5371.82	3245.64	<.01
PHOSP.INC/PER (P.I/P)	8	384.32	48.04	29.03	<.01
PHOSP.EX/TIME (P.E/T)	16	720.72	45.05	27.22	<.01
INC/PER.EX/TIME (I/P.E/T)	8	367.74	45.97	27.77	<.01
PHOSP.INC/PER.EX/TIME	32	1401.50	43.80	26.46	<.01
REPS	2	9.69	4.85	3.01	
Residual	150	248.26	1.66		
Total	224	124308.57			

SE = 1.29; CV = 2.5

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS Days	INCUBATION PERIOD (DAYS)			Means ³
		1 ²	120 ²	240 ²	
0	1	30.13 ^{ef}	44.83 ^{ij}	55.17 ^k	43.38 ^g
	7	22.90 ^d	35.87 ^g	36.50 ^g	31.76 ^d
	14	18.58 ^c	30.83 ^f	31.33 ^{fg}	26.91 ^c
	28	14.77 ^{bc}	25.47 ^{de}	26.20 ^d	22.15 ^b
	56	10.77 ^a	23.23 ^d	21.33 ^{cd}	18.44 ^a
	Means ¹		19.43 ^a	32.05 ^d	34.11 ^e
25	1	32.80 ^{fg}	57.83 ^{kl}	57.98 ^{kl}	49.54 ^h
	7	24.43 ^d	43.27 ^{hi}	40.35 ^h	36.02 ^e
	14	21.33 ^{cd}	38.10 ^{gh}	34.92 ^g	31.45 ^d
	28	18.30 ^c	28.80 ^{ef}	30.77 ^f	25.96 ^c
	56	11.80 ^{ab}	25.43 ^{de}	25.27 ^{de}	20.83 ^b
	Means ¹		21.73 ^b	38.69 ^g	37.86 ^f
50	1	41.70 ^{hi}	62.10 ^{lm}	65.67 ^{mn}	56.49 ^j
	7	27.00 ^e	47.60 ^j	46.75 ^{ij}	40.45 ^f
	14	23.33 ^d	43.90 ⁱ	42.30 ^{hi}	36.51 ^e
	28	21.77 ^{cd}	34.73 ^g	34.60 ^g	30.37 ^d
	56	14.67 ^b	31.03 ^f	30.23 ^{ef}	25.31 ^c
	Means ¹		25.69 ^c	43.87 ^h	43.91 ^h

100	1	56.40 ^{kl}	74.17 ^p	74.00 ^p	68.19 ^l
	7	42.23 ^{hi}	59.05 ^l	59.50 ^l	53.59 ⁱ
	14	34.83 ^g	50.90 ^j	55.38 ^k	47.04 ^g
	28	28.33 ^{ef}	43.93 ⁱ	50.00 ^j	40.75 ^f
	56	22.77 ^d	41.83 ^{hi}	43.67 ^{hi}	36.09 ^e
Means ¹		36.91 ^f	53.98 ⁱ	56.51 ^j	
200	1	90.47 ^r	100.67 ^s	106.17 ^t	99.10 ⁿ
	7	65.80 ^{mn}	75.87 ^{pq}	87.97 ^r	76.55 ^m
	14	58.00 ^{kl}	69.10 ⁿ	79.25 ^q	67.45 ^l
	28	48.30 ^j	64.97 ^m	69.00 ⁿ	60.76 ^k
	56	42.27 ^{hi}	56.40 ^{kl}	59.27 ^l	52.65 ⁱ
Means ¹		60.67 ^k	73.40 ^l	79.53 ^m	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [P.I/P = 1.58, P.I/P.E/T = 3.53, P.E/T = 2.04] for Means^{1,2,3} respectively.

4. Effects of DMT-HFO extractions on the dilute hydrochloric acid extracted inorganic P (D/HCl-P_i) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	5060.68	1265.17	802.95	<.01
INC/PER (I/P)	2	296.67	148.34	94.14	<.01
EX/TIME (E/T)	4	1360.30	340.07	215.83	<.01
PHOSP.INC/PER (P.I/P)	8	343.59	42.95	27.26	<.01
PHOSP.EX/TIME (P.E/T)	16	242.63	15.16	9.62	<.01
INCPER.EX/TIME (I.E/T)	8	55.30	6.91	4.39	<.01
PHOSP.INC/PER.EX/TIME	32	22.97	0.72	0.46	0.99
REPS	2	5.57	2.78	1.78	
Residual	150	236.35	1.58		
Total	224	7618.48			

SE = 1.26; CV = 10.0

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	8.43 ^b	7.72 ^{ab}	9.87 ^{bc}	8.67 ^{bc}
	7	5.95 ^{ab}	6.13 ^{ab}	7.80 ^{ab}	6.63 ^{ab}
	14	5.20 ^{ab}	6.00 ^{ab}	7.08 ^{ab}	6.09 ^a
	28	5.10 ^{ab}	5.53 ^{ab}	6.20 ^{ab}	5.61 ^a
	56	5.00 ^{ab}	4.97 ^a	5.40 ^{ab}	5.12 ^a
	Means ¹		5.94 ^a	6.07 ^a	7.27 ^{ab}
25	1	10.73 ^{bc}	11.92 ^c	14.17 ^{cd}	12.27 ^{cd}
	7	8.00 ^{ab}	9.43 ^{bc}	11.43 ^{bc}	9.62 ^{bc}
	14	7.75 ^{ab}	8.80 ^{bc}	9.98 ^{bc}	8.84 ^{bc}
	28	7.07 ^{ab}	7.92 ^{ab}	9.33 ^{bc}	8.11 ^b
	56	6.60 ^{ab}	6.92 ^{ab}	7.77 ^{ab}	7.10 ^{ab}
	Means ¹		8.03 ^b	9.00 ^{bc}	10.54 ^c
50	1	13.53 ^{cd}	13.07 ^{cd}	18.33 ^{de}	14.98 ^{de}
	7	10.33 ^{bc}	12.50 ^{cd}	14.17 ^{cd}	12.33 ^{cd}
	14	9.40 ^{bc}	10.43 ^{bc}	12.72 ^{cd}	10.85 ^c
	28	9.20 ^{bc}	9.23 ^{bc}	10.30 ^{bc}	10.58 ^c
	56	8.57 ^{bc}	8.80 ^{bc}	8.80 ^{bc}	8.72 ^{bc}
	Means ¹		10.21 ^c	11.41 ^{cd}	12.86 ^e
100	1	15.50 ^d	16.87 ^{de}	22.27 ^{ef}	18.21 ^{ef}
	7	13.80 ^{cd}	15.00 ^{cd}	16.40 ^d	15.07 ^{de}
	14	10.80 ^{bc}	14.43 ^{cd}	14.95 ^{cd}	13.39 ^d
	28	11.50 ^{bc}	12.53 ^{cd}	12.53 ^{cd}	12.19 ^{cd}
	56	10.87 ^{bc}	11.07 ^{bc}	11.67 ^{bc}	11.20 ^c
	Means ¹		12.49 ^d	13.98 ^{de}	15.56 ^e
200	1	20.62 ^e	28.93 ^g	27.53 ^{fg}	25.69 ^g
	7	17.25 ^{de}	24.50 ^f	20.52 ^e	20.76 ^f
	14	14.70 ^{cd}	24.67 ^f	18.78 ^{de}	19.38 ^f
	28	14.27 ^{cd}	20.03 ^e	16.53 ^d	16.94 ^e
	56	13.23 ^{cd}	18.13 ^{de}	14.30 ^{cd}	15.22 ^{de}
	Means ¹		16.01 ^e	23.25 ^g	19.53 ^f

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P.I/P = 1.54, P.I/P.E/T = 3.44, P.E/T = 1.99] for Means^{1,2,3} respectively.

5. The effects of DMT-HFO extractions on the concentrated hydrochloric acid extracted inorganic P (C/HCl-P_i) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	13994.08	3498.52	2040.61	<.01
INC/PER (I/P)	2	6244.70	3122.35	1821.20	<.01
EX/TIME (E/T)	4	5914.42	1478.61	862.44	<.01
PHOSP.INC/PER (P.I/P)	8	2392.25	299.03	174.42	<.01
PHOSP.EX/TIME (P.E/T)	16	165.35	10.33	6.03	<.01
INC/PER.EX/TIME (I/P.E/T)	8	903.07	112.88	65.84	<.01
PHOSP.INC/PER.EX/TIME	32	293.83	9.18	5.36	<.01
REPS	2	2.65	1.33	0.77	
Residual	150	257.17	1.71		
Total	224	30164.87			

SE = 1.31; CV = 2.4

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			Means ³
		Days	1 ²	120 ²	
0	1	48.33 ^d	51.27 ^{de}	58.70 ^{fg}	52.77 ^g
	7	41.27 ^{bc}	43.33 ^{bc}	50.00 ^d	44.87 ^d
	14	40.53 ^b	41.77 ^{bc}	46.60 ^{cd}	42.97 ^{cd}
	28	38.60 ^{ab}	38.93 ^{ab}	40.60 ^b	39.38 ^{bc}
	56	35.77 ^a	35.83 ^a	38.27 ^{ab}	36.62 ^a
Means ¹		40.90 ^a	42.23 ^{ab}	46.83 ^c	
25	1	50.60 ^{de}	52.53 ^{ef}	60.00 ^g	54.38 ^{gh}
	7	43.67 ^{bc}	46.27 ^{cd}	53.90 ^{ef}	47.95 ^e
	14	43.60 ^{bc}	43.20 ^{bc}	49.37 ^{de}	45.39 ^{de}
	28	40.20 ^b	41.53 ^{bc}	46.67 ^{cd}	42.80 ^{cd}
	56	37.07 ^{ab}	37.33 ^{ab}	42.27 ^{bc}	38.89 ^b
Means ¹		44.18 ^b	46.75 ^c	53.21 ^d	
50	1	51.20 ^{de}	55.40 ^{ef}	64.40 ^h	57.00 ^h
	7	45.53 ^{cd}	49.00 ^{de}	56.07 ^f	50.20 ^f
	14	44.53 ^c	45.93 ^{cd}	51.33 ^{de}	47.26 ^e
	28	41.33 ^{bc}	42.87 ^{bc}	49.27 ^{de}	44.49 ^d
	56	38.33 ^{ab}	40.53 ^b	45.00 ^{cd}	41.29 ^c
Means ¹		44.18 ^b	46.75 ^c	53.21 ^d	

100	1	52.00 ^e	61.17 ^{gh}	76.30 ^j	63.16 ⁱ
	7	48.53 ^{de}	54.67 ^{ef}	62.93 ^{gh}	55.38 ^h
	14	46.80 ^{cd}	53.40 ^{ef}	59.00 ^{fg}	53.07 ^g
	28	43.60 ^{bc}	47.00 ^{cd}	53.00 ^{ef}	47.87 ^e
	56	42.47 ^{bc}	45.87 ^{cd}	48.00 ^{cd}	45.45 ^{de}
Means ¹		46.68 ^c	52.42 ^d	59.85 ^e	
200	1	54.67 ^{ef}	76.60 ^j	95.80 ^m	75.69 ^m
	7	54.20 ^{ef}	73.87 ^j	86.10 ^l	71.39 ^l
	14	53.53 ^{ef}	71.20 ^{ij}	81.60 ^k	68.78 ^k
	28	52.67 ^{ef}	68.20 ⁱ	76.67 ^j	65.85 ^j
	56	49.87 ^{de}	65.93 ^{hi}	71.67 ^{ij}	62.49 ⁱ
Means ¹		52.99 ^d	71.16 ^f	82.37 ^g	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.60$, $P.I/P.E/T = 3.59$, $P.E/T = 2.07$] for Means^{1,2,3} respectively.

6. The effects of DMT-HFO extractions on the concentrated sulphuric acid extracted residual P ($H_2SO_4-P_i$) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	17977.67	4494.42	2268.72	<.01
INC/PER (I/P)	2	7174.57	3587.28	1810.81	<.01
EX/TIME (E/T)	4	8076.88	2019.22	1019.28	<.01
PHOSP.INC/PER (P.I/P)	8	4797.12	599.64	302.69	<.01
PHOSP.EX/TIME (P.E/T)	16	520.13	32.52	16.41	<.01
INC/PER.EX/TIME (I/P.E/T)	8	482.38	60.30	30.44	<.01
PHOSP.INC/PER.EX/TIME	32	568.24	17.76	8.96	<.01
REPS	2	0.98	0.49	0.25	
Residual	150	297.16	1.98		
Total	224	39894.15			

SE = 1.41; CV = 2.4

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)				Means ³
		Days	1 ²	120 ²	240 ²	
0	1	56.67 ^{hi}	58.42 ^{hi}	60.83 ^{ij}	58.64 ^h	
	7	39.33 ^d	45.67 ^{ef}	50.67 ^{fg}	45.22 ^e	
	14	36.03 ^{cd}	40.75 ^{de}	48.17 ^{fg}	41.65 ^d	
	28	30.42 ^b	33.88 ^{bc}	40.40 ^{de}	34.90 ^b	
	56	26.08 ^a	31.33 ^b	35.25 ^c	30.89 ^a	
	Means ¹		37.71 ^a	42.01 ^b	47.06 ^d	
25	1	59.92 ⁱ	60.92 ^{ij}	68.13 ^{jk}	62.99 ⁱ	
	7	44.50 ^{ef}	49.75 ^{fg}	58.83 ^{hi}	51.03 ^f	
	14	38.17 ^{cd}	45.13 ^{ef}	56.92 ^{hi}	46.74 ^e	
	28	31.83 ^{bc}	38.02 ^{cd}	48.33 ^{fg}	39.39 ^c	
	56	28.25 ^{ab}	33.92 ^{bc}	43.33 ^e	35.17 ^b	
	Means ¹		40.53 ^b	45.55 ^c	55.11 ^f	
50	1	61.72 ^{ij}	68.67 ^k	76.25 ^l	68.88 ^k	
	7	47.67 ^f	54.58 ^{gh}	64.67 ^j	55.64 ^g	
	14	43.40 ^e	49.77 ^{fg}	59.42 ^{hi}	50.86 ^f	
	28	37.67 ^{cd}	44.30 ^{ef}	52.73 ^{gh}	44.90 ^e	
	56	31.20 ^b	36.52 ^{cd}	47.75 ^f	38.49 ^c	
	Means ¹		44.33 ^c	50.77 ^e	60.16 ^h	
100	1	67.83 ^{jk}	79.08 ^l	91.00 ⁿ	79.30 ^m	
	7	51.75 ^g	67.90 ^{jk}	78.33 ^l	65.99 ^j	
	14	50.77 ^{fg}	61.45 ^{ij}	71.83 ^k	61.35 ⁱ	
	28	43.25 ^e	50.98 ^{fg}	64.33 ^j	52.85 ^f	
	56	36.50 ^{cd}	45.60 ^{ef}	58.92 ^{hi}	47.01 ^e	
	Means ¹		50.02 ^e	61.00 ^h	75.88 ⁱ	
200	1	69.83 ^k	92.67 ^{np}	116.13 ^r	92.88 ^p	
	7	59.67 ^{hi}	85.80 ^m	103.25 ^q	82.91 ⁿ	
	14	55.93 ^h	77.50 ^l	96.35 ^p	76.59 ^l	
	28	53.83 ^{gh}	70.23 ^k	88.67 ^{mn}	70.91 ^k	
	56	46.90 ^{ef}	66.42 ^{jk}	86.00 ^m	66.44 ^j	
	Means ¹		57.23 ^g	78.52 ^j	98.08 ^k	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.72$, $P.I/P.E/T = 3.86$, $P.E/T = 2.23$] for Means^{1,2,3} respectively.

7. The effects of DMT-HFO extractions on the bicarbonate extracted organic P ($-HCO_3-P_o$) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	1594.35	398.59	464.68	<.01
INC/PER (I/P)	2	369.16	184.58	215.19	<.01
EX/TIME (E/T)	4	1786.47	446.62	520.67	<.01
PHOSP.INC/PER (P.I/P)	8	136.44	17.06	19.88	<.01
PHOSP.EX/TIME (P.E/T)	16	123.68	7.73	9.01	<.01
INC/PER.EX/TIME (I/P.E/T)	8	47.90	5.99	6.98	<.01
PHOSP.INC/PER.EX/TIME	32	150.94	4.72	5.50	<.01
REPS	2	3.45	1.72	2.04	
Residual	150	128.67	0.86		
Total	224	4337.61			

SE = 0.93; CV = 9.4

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			Means ³
		Days	1 ²	120 ²	
0	1	11.50 ^{de}	9.03 ^d	6.90 ^{cd}	9.14 ^e
	7	3.50 ^{ab}	7.33 ^{cd}	5.70 ^{bc}	5.51 ^{bc}
	14	1.97 ^{ab}	6.50 ^{cd}	4.00 ^{bc}	4.16 ^b
	28	1.37 ^{ab}	5.00 ^{bc}	3.87 ^{bc}	3.41 ^{ab}
	56	1.13 ^a	4.28 ^{bc}	2.50 ^{ab}	2.64 ^a
	Means ¹		3.89 ^a	6.43 ^c	4.59 ^{ab}
25	1	11.60 ^e	10.45 ^{de}	9.40 ^{de}	10.84 ^f
	7	4.70 ^{bc}	8.35 ^{cd}	7.00 ^{cd}	6.68 ^{cd}
	14	4.40 ^{bc}	6.90 ^{cd}	5.67 ^{bc}	5.66 ^c
	28	3.23 ^{ab}	5.97 ^{bc}	4.43 ^{bc}	4.54 ^{bc}
	56	2.22 ^{ab}	4.80 ^{bc}	3.80 ^b	3.61 ^{ab}
	Means ¹		5.23 ^b	7.29 ^{cd}	6.06 ^{bc}
50	1	12.27 ^{ef}	12.33 ^{ef}	11.60 ^e	12.07 ^{fg}
	7	5.50 ^{bc}	9.97 ^{de}	8.88 ^{cd}	8.12 ^{de}
	14	4.20 ^{bc}	8.47 ^{cd}	6.78 ^{cd}	6.48 ^{cd}
	28	3.13 ^{ab}	7.63 ^{cd}	5.50 ^{bc}	5.42 ^{bc}
	56	2.40 ^{ab}	6.50 ^{cd}	4.40 ^{bc}	4.43 ^{bc}
	Means ¹		5.50 ^b	8.98 ^d	7.43 ^{cd}

100	1	12.50 ^{ef}	14.92 ^f	12.27 ^{ef}	13.23 ^g
	7	7.77 ^{cd}	11.57 ^{de}	10.33 ^{de}	9.89 ^{ef}
	14	6.50 ^{bc}	9.77 ^{de}	9.30 ^{de}	8.52 ^{de}
	28	5.17 ^{bc}	8.47 ^{cd}	7.53 ^{cd}	7.06 ^{cd}
	56	3.87 ^{bc}	7.63 ^{cd}	6.67 ^{cd}	6.06 ^{cd}
Means ¹		7.16 ^c	10.47 ^e	9.22 ^d	
200	1	13.53 ^{ef}	17.25 ^g	14.20 ^f	14.99 ^h
	7	9.37 ^{de}	14.03 ^{ef}	11.67 ^{ef}	11.69 ^f
	14	7.40 ^{cd}	12.47 ^{ef}	10.67 ^{de}	10.18 ^e
	28	6.40 ^c	10.13 ^{de}	9.50 ^{de}	8.68 ^{de}
	56	5.27 ^{bc}	8.73 ^{cd}	8.18 ^{cd}	7.39 ^d
Means ¹		8.39 ^d	12.52 ^f	10.84 ^e	

N.B. Means with the same superscripts are not significantly different ($P = 0.001$) LSD (Fisher) [$P.I/P = 1.14$, $P.I/P.E/T = 2.54$, $P.E/T = 1.46$] for Means^{1,2,3} respectively.

8. The effects of DMT-HFO extractions on the hydroxide extracted organic P (-OH-P_o) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	3733.95	933.49	533.54	<.01
INC/PER (I/P)	2	682.17	341.09	194.95	<.01
EX/TIME (E/T)	4	1213.40	303.35	173.38	<.01
PHOSP.INC/PER (P.I/P)	8	613.06	76.63	43.80	<.01
PHOSP.EX/TIME (P.E/T)	16	45.17	2.82	1.61	0.71
INC/PER.EX/TIME (I/P.E/T)	8	175.11	21.89	12.51	<.01
PHOSP.INC/PER.EX/TIME	32	90.58	2.83	1.62	0.29
REPS	2	5.48	2.74	1.58	
Residual	150	262.44	1.75		
Total	224	6815.87			

SE = 1.32; CV = 8.0

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			Means ³
		Days	1 ²	120 ²	
0	1	12.97 ^{bc}	12.37 ^{bc}	10.75 ^{bc}	12.03 ^{cd}
	7	9.63 ^{ab}	10.28 ^{bc}	9.23 ^{ab}	9.71 ^{bc}
	14	8.55 ^{ab}	9.37 ^{ab}	8.20 ^{ab}	8.71 ^b
	28	7.00 ^{ab}	8.07 ^{ab}	7.92 ^{ab}	7.66 ^{ab}
	56	6.10 ^a	6.83 ^{ab}	6.80 ^{ab}	6.58 ^a
Means ¹		8.85 ^a	9.38 ^{ab}	8.58 ^a	
25	1	13.17 ^{bc}	13.63 ^c	12.82 ^{bc}	13.21 ^d
	7	10.90 ^{bc}	12.37 ^{bc}	10.95 ^{bc}	11.41 ^{cd}
	14	9.33 ^{ab}	11.87 ^{bc}	10.62 ^{bc}	10.61 ^c
	28	8.00 ^{ab}	9.93 ^{bc}	9.77 ^b	9.23 ^{bc}
	56	7.53 ^{ab}	8.50 ^{ab}	8.43 ^{ab}	8.15 ^{ab}
Means ¹		9.79 ^{ab}	11.26 ^{bc}	10.52 ^b	
50	1	14.03 ^c	14.23 ^{cd}	13.63 ^c	13.96 ^d
	7	11.67 ^{bc}	13.10 ^{bc}	12.75 ^{bc}	12.51 ^{cd}
	14	10.00 ^{bc}	12.30 ^{bc}	11.30 ^{bc}	11.20 ^{cd}
	28	9.53 ^{ab}	11.40 ^{bc}	10.50 ^{bc}	10.48 ^c
	56	9.00 ^{ab}	10.23 ^{bc}	9.57 ^{ab}	9.60 ^{bc}
Means ¹		10.85 ^{bc}	12.25 ^c	11.55 ^{bc}	
100	1	14.80 ^{cd}	18.60 ^d	15.33 ^{cd}	16.24 ^e
	7	12.90 ^{bc}	15.88 ^{cd}	13.45 ^c	14.08 ^d
	14	11.50 ^{bc}	13.30 ^{bc}	12.15 ^{bc}	12.32 ^{cd}
	28	10.00 ^{bc}	13.00 ^{bc}	11.47 ^{bc}	11.49 ^{cd}
	56	9.50 ^{ab}	11.50 ^{bc}	10.50 ^{bc}	10.50 ^c
Means ¹		11.74 ^{bc}	14.46 ^d	12.58 ^{cd}	
200	1	15.30 ^{cd}	25.20 ^e	17.80 ^d	19.43 ^e
	7	13.13 ^{bc}	20.33 ^d	15.50 ^{cd}	16.32 ^e
	14	13.17 ^{bc}	18.23 ^d	13.68 ^c	15.03 ^{de}
	28	12.53 ^{bc}	16.10 ^{cd}	12.93 ^{bc}	13.85 ^d
	56	11.83 ^{bc}	14.60 ^{cd}	11.00 ^{bc}	12.48 ^{cd}
Means ¹		13.19 ^{cd}	18.89 ^e	14.18 ^d	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.62$, $P.I/P.E/T = 3.63$, $P.ET = 2.09$] for Means^{1,2,3} respectively.

9. The effects of DMT-HFO extractions on the concentrated hydrochloric acid extracted organic P (C/HCl-P_o) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	1093.23	273.31	250.79	<.01
INC/PER (I/P)	2	356.05	178.03	163.36	<.01
EX/TIME (E/T)	4	380.49	95.12	87.29	<.01
PHOSP.INC/PER (P.I/P)	8	128.02	16.00	14.68	<.01
PHOSP.EX/TIME (P.E/T)	16	41.32	2.58	2.37	0.04
INC/PER.EX/TIME (I.E/T)	8	35.86	4.48	4.11	<.01
PHOSP.INC/PER.EX/TIME	32	64.62	2.02	1.85	0.07
REPS	2	1.32	0.66	0.60	
Residual	150	163.47	1.09		
Total	224	2263.06			

SE = 1.04; CV = 9.8

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			Means ³
		Days	1 ²	120 ²	
0	1	7.00 ^{bc}	7.07 ^{bc}	7.77 ^{bc}	7.28 ^{cd}
	7	5.47 ^b	4.73 ^{ab}	5.67 ^{bc}	5.29 ^{bc}
	14	4.50 ^{ab}	4.55 ^{ab}	4.50 ^{ab}	4.52 ^{ab}
	28	4.00 ^{ab}	3.63 ^{ab}	3.97 ^{ab}	3.87 ^{ab}
	56	3.27 ^{ab}	2.57 ^a	3.27 ^{ab}	3.04 ^a
Means ¹		4.85 ^{ab}	4.51 ^a	5.04 ^{ab}	
25	1	7.30 ^{bc}	7.60 ^{bc}	8.52 ^c	7.81 ^{cd}
	7	5.67 ^{bc}	6.03 ^{bc}	7.03 ^{bc}	6.24 ^{bc}
	14	5.00 ^{ab}	5.17 ^{ab}	6.00 ^{bc}	5.39 ^{bc}
	28	4.40 ^{ab}	4.53 ^{ab}	5.33 ^{ab}	4.75 ^b
	56	3.47 ^{ab}	6.53 ^{bc}	4.23 ^{ab}	4.74 ^b
Means ¹		5.17 ^{ab}	5.97 ^b	6.22 ^b	
50	1	8.20 ^{bc}	8.53 ^c	9.70 ^{cd}	8.81 ^{de}
	7	7.13 ^{bc}	7.23 ^{bc}	8.87 ^c	7.64 ^{cd}
	14	6.00 ^{bc}	6.27 ^{bc}	7.57 ^{bc}	6.61 ^c
	28	5.50 ^b	5.07 ^{ab}	6.73 ^{bc}	5.77 ^{bc}
	56	4.83 ^{ab}	6.57 ^{bc}	5.93 ^{bc}	5.78 ^{bc}
Means ¹		6.33 ^{bc}	6.73 ^{bc}	7.70 ^c	

100	1	8.67 ^c	10.10 ^{cd}	12.35 ^d	10.37 ^e
	7	7.47 ^{bc}	8.27 ^{bc}	10.37 ^{cd}	8.70 ^d
	14	6.00 ^{bc}	7.27 ^{bc}	9.47 ^{cd}	7.58 ^{cd}
	28	6.07 ^{bc}	6.33 ^{bc}	8.33 ^{bc}	6.91 ^c
	56	5.28 ^{ab}	6.03 ^{bc}	7.27 ^{bc}	6.19 ^{bc}
Means ¹		6.70 ^{bc}	7.60 ^c	9.56 ^d	
200	1	9.70 ^{cd}	12.37 ^d	13.53 ^d	11.87 ^e
	7	7.90 ^{bc}	9.83 ^{cd}	11.77 ^d	9.83 ^{de}
	14	7.60 ^{bc}	9.13 ^{cd}	10.40 ^{cd}	9.04 ^{de}
	28	6.50 ^{bc}	8.00 ^{bc}	9.60 ^{cd}	8.03 ^{cd}
	56	6.13 ^{bc}	6.67 ^{bc}	9.03 ^{cd}	7.28 ^{cd}
Means ¹		7.57 ^c	9.20 ^d	10.87 ^e	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.28$, $P.I/P.E/T = 2.86$, $P.E/T = 1.65$] for Means^{1,2,3} respectively.

10. The effects of DMT-HFO extractions on the extracted total organic P (TOT-P_o) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f. (m.v.)	s.s.	m.s.	F	F pr.
PHOSP (P)	4	18063.21	4515.80	1353.50	<.01
INC/PER (I/P)	2	364.81	182.40	54.67	<.01
EX/TIME (E/T)	4	9253.74	2313.44	693.39	<.01
PHOSP.INC/PER (P.I/P)	8	1854.41	231.80	69.48	<.01
PHOSP.EX/TIME (P.E/T)	16	79.33	29.96	8.98	<.01
INC/PER.EX/TIME (I/P.E/T)	8	235.29	29.41	8.82	<.01
PHOSP.INC/PER.EX/TIME	32	646.83	20.21	6.06	<.01
REPS	2	8.38	4.19	1.26	
Residual	149(1)	497.12	3.34		
Total	223(1)	31015.26			

SE = 1.83; CV = 4.9

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)				Means ³
		Days	1 ²	120 ²	240 ²	
0	1	39.47 ^e	28.47 ^{cd}	31.42 ^{cd}	33.12 ^{de}	
	7	31.60 ^{cd}	24.15 ^{bc}	28.60 ^{cd}	28.12 ^c	
	14	26.52 ^{bc}	24.40 ^{bc}	25.20 ^{bc}	25.37 ^{bc}	
	28	23.17 ^b	19.40 ^{ab}	23.75 ^{bc}	22.11 ^{ab}	
	56	21.30 ^{ab}	17.68 ^a	20.57 ^{ab}	19.85 ^a	
	Means ¹		28.41 ^c	22.82 ^a	25.91 ^b	
25	1	41.07 ^e	38.68 ^e	38.73 ^e	39.49 ^f	
	7	35.27 ^{de}	32.75 ^{cd}	31.38 ^{cd}	33.13 ^{de}	
	14	31.13 ^{cd}	32.23 ^{cd}	30.62 ^{cd}	31.33 ^d	
	28	28.23 ^c	25.17 ^{bc}	26.43 ^{bc}	26.61 ^{bc}	
	56	25.22 ^{bc}	22.43 ^{ab}	23.57 ^b	23.74 ^b	
	Means ¹		32.18 ^d	30.25 ^{cd}	30.15 ^{cd}	
50	1	43.50 ^{ef}	44.10 ^f	45.93 ^{fg}	44.51 ^g	
	7	37.30 ^{de}	39.30 ^{ef}	41.50 ^{ef}	39.37 ^f	
	14	34.87 ^{de}	34.03 ^{de}	36.65 ^{de}	35.18 ^e	
	28	33.47 ^d	30.07 ^{cd}	31.73 ^{cd}	31.76 ^d	
	56	27.77 ^{bc}	25.30 ^{bc}	27.40 ^{bc}	26.82 ^c	
	Means ¹		35.38 ^e	34.56 ^e	36.64 ^{ef}	
100	1	44.97 ^{fg}	54.62 ^h	59.95 ⁱ	53.18 ⁱ	
	7	41.13 ^{ef}	47.72 ^{fg}	49.45 ^g	46.10 ^g	
	14	37.00 ^{de}	43.33 ^{ef}	42.92 ^{ef}	41.08 ^f	
	28	36.60 ^{de}	37.80 ^{de}	38.33 ^{de}	37.58 ^{ef}	
	56	32.38 ^{cd}	28.57 ^{cd}	32.43 ^{cd}	31.13 ^d	
	Means ¹		38.42 ^f	42.41 ^g	44.62 ^g	
200	1	48.53 ^{fg}	69.82 ^j	72.53 ^j	63.63 ^k	
	7	46.40 ^{fg}	63.20 ⁱ	61.93 ⁱ	57.18 ^j	
	14	43.17 ^{ef}	54.83 ^h	56.53 ^h	51.51 ^h	
	28	40.93 ^{ef}	49.23 ^g	48.03 ^{fg}	46.07 ^g	
	56	36.23 ^{de}	42.00 ^{ef}	39.52 ^{ef}	39.25 ^f	
	Means ¹		43.05 ^g	55.82 ^h	55.71 ^h	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [P.I/P = 2.24, P.I/P.E/T = 5.01, P.E/T = 2.89] for Means^{1,2,3} respectively.

11. The effects of DMT-HFO extractions on the extracted total inorganic P (TOT-P_i) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.(m.v.)	s.s.	m.s.	F	F pr.
PHOSP (P)	4	884304.60	221076.15	3.64E+04	<.01
INC/PER (I/P)	2	15109.24	7554.62	1244.99	<.01
EX/TIME (E/T)	4	62779.61	15694.90	2586.50	<.01
PHOSP.INC/PER (P.I/P)	8	2621.83	327.73	54.01	<.01
PHOSP.EX/TIME (P.E/T)	16	1654.24	103.39	17.04	<.01
INC/PER.EX/TIME	8	987.15	123.39	20.34	<.01
PHOSP.INC/PER.EX/TIME	32	1745.25	54.54	8.99	<.01
REPS	2	35.46	17.73	3.00	
Residual	149(1)	904.13	6.07		
Total	223(1)	957442.83			

SE = 2.46; CV = 1.1

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			Means ³
		Days	1 ²	120 ²	
0	1	151.8 ^f	169.5 ^{hi}	190.2 ^{jk}	170.48 ^g
	7	142.2 ^e	160.3 ^g	170.2 ^{hi}	157.58 ^e
	14	125.4 ^c	145.3 ^{ef}	155.1 ^{fg}	141.93 ^c
	28	116.9 ^b	128.9 ^{cd}	132.9 ^d	126.24 ^b
	56	106.0 ^a	116.4 ^b	125.0 ^c	115.81 ^a
	Means ¹		128.5 ^a	144.1 ^b	154.7 ^c
25	1	180.3 ^{ij}	193.9 ^{kl}	204.9 ^m	193.03 ^j
	7	165.0 ^{gh}	179.4 ^{ij}	189.6 ^{jk}	177.97 ^h
	14	150.7 ^f	167.6 ^h	175.8 ⁱ	164.68 ^f
	28	144.0 ^{ef}	155.8 ^{fg}	156.7 ^{fg}	152.16 ^d
	56	137.9 ^{de}	143.0 ^e	152.3 ^f	144.42 ^c
	Means ¹		155.6 ^c	168.0 ^d	175.8 ^e
50	1	209.9 ^m	220.7 ⁿ	245.9 ^{qr}	225.48 ^m
	7	191.4 ^{kl}	204.1 ^{im}	222.6 ⁿ	206.02 ^l
	14	191.0 ^k	200.3 ^{im}	209.6 ^m	200.28 ^k
	28	168.3 ^h	184.1 ^j	197.8 ^l	183.43 ⁱ
	56	159.3 ^g	185.7 ^{jk}	194.2 ^{kl}	179.73 ^h
	Means ¹		184.0 ^f	199.0 ^g	214.0 ^h

100	1	261.7 ^s	259.2 ^s	280.5 ^t	267.14 ^q
	7	252.2 ^r	247.9 ^{qr}	263.8 ^s	154.62 ^{de}
	14	234.5 ^p	250.0 ^{qr}	244.6 ^q	243.04 ^p
	28	224.6 ⁿ	225.6 ⁿ	244.9 ^q	231.72 ⁿ
	56	225.9 ^{np}	232.4 ^p	237.2 ^p	231.83 ⁿ
Means ¹		239.8 ⁱ	243.0 ^j	254.2 ^k	
200	1	342.6 ^x	329.5 ^w	351.1 ^y	341.04 ^v
	7	331.7 ^{wx}	331.2 ^{wx}	337.3 ^x	333.39 ^u
	14	309.2 ^v	315.7 ^v	326.8 ^w	317.23 ^t
	28	302.3 ^u	303.7 ^{uv}	311.5 ^v	305.82 ^s
	56	295.4 ^u	295.9 ^u	302.0 ^u	297.75 ^r
Means ¹		316.2 ^l	315.2 ^l	325.7 ^m	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 3.02$, $P.I/P.E/T = 6.75$, $P.E/T = 3.90$] for Means^{1,2,3} respectively.

12. The effects of DMT-HFO extractions on the extracted total soil P (TOT-P) of Rustenburg soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	1.16E+06	2.89E+05	7.92E+04	<.01
INC/PER (I/P)	2	2.02E+04	1.01E+04	2769.64	<.01
EX/TIME (E/T)	4	1.20E+05	3.00E+04	8216.00	<.01
PHOSP.INC/PER (P.I/P)	8	8.31E+02	1.04E+02	28.47	<.01
PHOSP.EX/TIME (P.E/T)	16	1.09E+03	6.80E+01	18.66	<.01
INC/PER.EX/TIME (I/P.E/T)	8	1.63E+03	2.03E+02	55.79	<.01
PHOSP.INC/PER.EX/TIME	32	1.59E+03	4.98E+01	13.66	<.01
REPS	2	1.09E+01	5.47E+00	1.51	
Residual	150	5.47E+02	3.65E+00		
Total	224	1.30E+06			

SE = 1.91; CV = 0.8

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	191.3 ^k	197.9 ^l	221.6 ^p	203.60 ^g
	7	173.8 ^{hi}	184.5 ^{jk}	198.8 ^l	185.70 ^e
	14	151.9 ^{ef}	169.7 ^h	180.3 ^{ij}	167.31 ^c
	28	140.1 ^c	148.3 ^e	156.7 ^f	148.34 ^b
	56	127.3 ^a	134.1 ^b	145.6 ^d	135.66 ^a
	Means ¹		156.9 ^a	166.9 ^b	180.6 ^c
25	1	221.4 ^p	232.6 ^{qr}	243.6 ^s	232.53 ^j
	7	200.3 ^l	212.1 ⁿ	220.9 ^p	211.10 ^h
	14	181.8 ^j	199.9 ^l	206.4 ^m	196.01 ^f
	28	172.2 ^{hi}	181.0 ^{ij}	183.1 ^{jk}	178.77 ^d
	56	163.1 ^g	165.5 ^{gh}	175.9 ⁱ	168.16 ^c
	Means ¹		187.7 ^d	198.2 ^e	206.0 ^f
50	1	253.4 ^t	264.8 ^{uv}	291.8 ^x	169.99 ^c
	7	228.7 ^q	243.4 ^s	264.1 ^u	245.38 ^k
	14	225.9 ^{pq}	234.3 ^r	246.2 ^s	235.47 ^j
	28	201.8 ^{lm}	214.2 ⁿ	229.6 ^{qr}	215.18 ⁱ
	56	187.1 ^k	211.0 ^m	221.6 ^p	206.57 ^g
	Means ¹		219.4 ^g	233.5 ^h	250.7 ⁱ
100	1	306.7 ^y	313.9 ^z	340.4 ^{BC}	320.32 ^q
	7	293.3 ^x	295.6 ^x	313.3 ^z	300.72 ^p
	14	271.6 ^v	293.4 ^x	287.5 ^{wx}	284.12 ⁿ
	28	261.2 ^u	263.4 ^u	283.3 ^w	269.30 ^m
	56	258.3 ^{tu}	261.0 ^u	269.6 ^v	262.96 ^l
	Means ¹		278.2 ^j	285.4 ^k	298.8 ^l
200	1	391.1 ^I	399.3 ^J	423.6 ^K	404.67 ^v
	7	378.1 ^G	394.4 ^I	399.2 ^J	390.57 ^u
	14	352.3 ^D	370.6 ^F	384.1 ^H	368.99 ^t
	28	343.2 ^C	352.9 ^D	359.6 ^E	351.89 ^s
	56	331.6 ^A	337.9 ^B	341.5 ^{BC}	337.00 ^r
	Means ¹		359.3 ^m	371.0 ⁿ	381.6 ^p

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 2.34$, $P.I/P.E/T = 5.23$, $P.E/T = 3.02$] for Means^{1,2,3} respectively.

B: LOSKOP SOIL

13 The effects of DMT-HFO extractions on the extractable solution P of Loskop soil as influenced by the added P, and the incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	112882.98	28220.75	1.85E+04	<.01
INC/PER (I/P)	2	6665.50	3332.75	2184.57	<.01
EX/TIME (E/T)	4	24763.29	6190.82	4057.99	<.01
PHOSP.INC/PER (P.I/P)	8	3948.59	493.57	323.53	<.01
PHOSP.EX/TIME (P.E/T)	16	8796.72	549.80	360.38	<.01
INC/PER.EX/TIME (I/P.E/T)	8	390.61	48.83	32.00	<.01
PHOSP.INC/PER.EX/TIME	32	642.11	20.07	13.15	<.01
REPS	2	7.98	3.99	2.67	
Residual	150	228.84	1.53		
Total	224	158318.63			

SE = 1.24; CV = 3.3

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS		INCUBATION PERIOD (DAYS)		
	Days	1 ²	120 ²	240 ²	Means ³
0	1	6.30 ^{ab}	5.22 ^{ab}	4.13 ^a	5.22 ^a
	7	8.42 ^b	6.72 ^{ab}	5.82 ^{ab}	6.99 ^{ab}
	14	10.50 ^{bc}	7.72 ^b	6.50 ^{ab}	8.24 ^b
	28	12.75 ^c	9.30 ^{bc}	8.55 ^b	10.20 ^c
	56	14.70 ^{cd}	12.20 ^c	12.17 ^c	13.02 ^d
Means ¹		10.53 ^b	8.23 ^a	7.43 ^a	
25	1	13.93 ^{cd}	12.63 ^c	10.13 ^{bc}	12.23 ^d
	7	20.50 ^e	16.77 ^d	14.80 ^{cd}	17.36 ^e
	14	24.03 ^f	22.22 ^{ef}	17.67 ^{de}	21.31 ^g
	28	32.25 ^h	26.88 ^{fg}	24.17 ^f	27.77 ⁱ
	56	35.97 ⁱ	32.87 ^{hi}	27.75 ^g	31.53 ^j
Means ¹		24.94 ^e	22.27 ^d	18.90 ^c	
50	1	27.38 ^{fg}	16.72 ^d	13.43 ^{cd}	19.18 ^f
	7	30.17 ^{gh}	22.53 ^{ef}	20.85 ^{ef}	24.52 ^h
	14	35.58 ^{hi}	26.52 ^{fg}	25.83 ^{fg}	29.31 ⁱ
	28	40.35 ^{jk}	32.40 ^h	30.50 ^{gh}	34.42 ^k
	56	45.65 ^k	42.03 ^{jk}	38.58 ^{ij}	42.09 ^m
Means ¹		35.83 ^g	28.04 ^f	25.84 ^e	

100	1	46.68 ^{k1}	24.27 ^f	18.73 ^{de}	29.89 ^j
	7	53.67 ^m	32.87 ^{hi}	33.43 ^{hi}	39.99 ^l
	14	60.05 ^{np}	43.42 ^k	40.33 ^{jk}	47.93 ⁿ
	28	71.05 ^r	58.53 ⁿ	56.50 ^{mn}	62.03 ^p
	56	77.53 st	71.67 ^r	63.17 ^p	70.79 ^q
Means ¹		61.80 ^j	46.15 ⁱ	42.43 ^h	
200	1	67.22 ^q	39.63 ^j	35.20 ^{hi}	47.35 ⁿ
	7	80.17 ^t	54.37 ^m	49.63 ^l	61.39 ^p
	14	92.80 ^v	70.17 ^{qr}	60.50 ^{np}	74.49 ^r
	28	102.50 ^w	88.43 ^u	76.17 ^s	89.03 ^s
	56	115.87 ^y	108.50 ^x	92.00 ^r	105.46 ^t
Means ¹		91.71 ^l	72.22 ^k	62.70 ^j	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.51$, $P.I/P.E/T = 3.39$, $P.E/T = 1.95$] for Means^{1,2,3} respectively.

14. The effects of DMT-HFO extractions on the bicarbonate extracted inorganic P ($-HCO_3-P_i$) of Loskop soil as influenced by the added P, and the incubation period

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	36593.89	9148.47	1.01E+04	<.01
INC/PER (I/P)	2	3735.67	1867.84	2066.95	<.01
EX/TIME (E/T)	4	5335.72	1333.93	1476.13	<.01
PHOSP.INC/PER (P.I/P)	8	1708.39	213.55	236.31	<.01
PHOSP.EX/TIME (P.E/T)	16	2081.44	130.09	143.96	<.01
INC/PER.EX/TIME (I/P.E/T)	8	1151.70	143.96	159.31	<.01
PHOSP.INC/PER.EX/TIME	32	644.78	20.15	22.30	<.01
REPS	2	5.36	2.68	3.05	
Residual	150	135.55	0.90		
Total	224	51387.16			

SE = 0.95; CV = 4.3

(ii). Table of means

ADDED-P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	12.27 ^{de}	11.27 ^{de}	9.60 ^{cd}	11.04 ^{de}
	7	12.00 ^{de}	10.47 ^d	7.77 ^c	10.08 ^d
	14	9.07 ^{cd}	7.80 ^c	6.50 ^{bc}	7.79 ^c
	28	7.47 ^c	5.90 ^{bc}	4.33 ^b	5.90 ^{bc}
	56	5.80 ^{bc}	3.27 ^{ab}	1.53 ^a	3.53 ^a
Means ¹		9.32 ^c	7.74 ^b	5.95 ^a	
25	1	18.87 ^{fg}	13.57 ^e	12.43 ^{de}	14.96 ^g
	7	14.43 ^{ef}	11.00 ^{de}	9.67 ^{cd}	11.70 ^e
	14	12.00 ^{de}	9.53 ^{cd}	8.33 ^{cd}	9.95 ^d
	28	8.57 ^{cd}	7.28 ^c	4.83 ^{bc}	6.89 ^c
	56	7.57 ^c	4.23 ^b	3.63 ^{ab}	5.14 ^b
Means ¹		12.29 ^d	9.12 ^c	7.78 ^b	
50	1	25.00 ^{hi}	20.87 ^{gh}	14.13 ^{ef}	20.00 ⁱ
	7	22.77 ^h	15.33 ^{ef}	12.93 ^{de}	17.01 ^h
	14	16.50 ^f	13.00 ^{de}	10.67 ^{de}	13.39 ^f
	28	13.27 ^e	10.97 ^{de}	7.53 ^c	10.59 ^{de}
	56	9.17 ^{cd}	8.10 ^{cd}	5.83 ^{bc}	7.70 ^c
Means ¹		17.34 ^f	13.65 ^e	10.22 ^c	
100	1	42.73 ^{lm}	35.47 ^k	22.10 ^{gh}	33.43 ^k
	7	33.13 ^{jk}	24.77 ^{hi}	16.55 ^f	24.82 ^j
	14	28.30 ⁱ	20.13 ^g	13.77 ^e	20.73 ⁱ
	28	20.50 ^{gh}	15.07 ^{ef}	11.07 ^{de}	15.55 ^{gh}
	56	15.33 ^{ef}	11.93 ^{de}	8.53 ^{cd}	11.93 ^{ef}
Means ¹		35.00 ^j	24.27 ^h	19.40 ^f	
200	1	78.00 ^q	56.33 ^p	44.83 ^m	62.06 ^p
	7	58.77 ^p	46.10 ^m	32.55 ^j	48.47 ⁿ
	14	50.47 ⁿ	40.93 ^l	27.43 ⁱ	43.61 ^m
	28	43.53 ^{lm}	32.70 ^j	21.93 ^{gh}	38.06 ^l
	56	26.83 ⁱ	28.07 ⁱ	17.23 ^f	32.71 ^k
Means ¹		51.52 ^l	40.83 ^k	28.79 ⁱ	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [P.I/P = 1.17, P.I/P.E/T = 2.61, PE = 1.50] for Means^{1,2,3} respectively.

15. The effects of DMT-HFO extractions on the hydroxide extracted inorganic P (-OH-P_i) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	58740.55	14685.14	1.12E+04	<.01
INC/PER (I/P)	2	3828.98	1914.49	1459.83	<.01
EX/TIME (E/T)	4	10806.55	2701.63	2060.04	<.01
PHOSP.INC/PER (P.I/P)	8	1176.93	147.12	112.18	<.01
PHOSP.EX/TIME (P.E/T)	16	1029.49	64.34	49.06	<.01
INC/PER.EX/TIME (I/P.E/T)	8	610.72	76.34	58.21	<.01
PHOSP.INC/PER.EX/TIME	32	658.17	20.57	15.68	<.01
REPS	2	10.87	5.44	4.33	
Residual	150	196.72	1.31		
Total	224	77048.09			

SE = 1.15; CV = 2.9

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			Means ³
		Days	1 ²	120 ²	
0	1	25.33 ^{de}	29.13 ^{ef}	32.93 ^{fg}	29.13 ^e
	7	20.83 ^c	25.13 ^{de}	28.87 ^e	24.94 ^d
	14	19.45 ^{bc}	21.43 ^{cd}	25.32 ^{de}	22.07 ^c
	28	15.93 ^{ab}	19.27 ^{bc}	21.60 ^{cd}	18.93 ^b
	56	13.40 ^a	17.57 ^b	19.30 ^{bc}	16.76 ^a
Means ¹		18.99 ^a	22.51 ^b	25.60 ^c	
25	1	28.13 ^e	33.27 ^{fg}	35.10 ^g	32.17 ^g
	7	24.13 ^d	27.67 ^e	32.27 ^{fg}	28.02 ^f
	14	22.07 ^{cd}	23.60 ^{cd}	28.98 ^{ef}	24.88 ^e
	28	18.13 ^{bc}	21.10 ^{cd}	23.45 ^{cd}	20.89 ^c
	56	14.72 ^{ab}	18.75 ^{bc}	20.60 ^{bc}	18.02 ^{ab}
Means ¹		21.44 ^b	24.88 ^c	28.08 ^d	
50	1	31.77 ^f	36.93 ^{gh}	41.10 ^{hi}	36.60 ^g
	7	28.30 ^e	32.27 ^{fg}	35.00 ^g	31.86 ^f
	14	25.83 ^{de}	29.97 ^{ef}	31.75 ^f	29.18 ^e
	28	22.67 ^{cd}	26.93 ^{de}	28.50 ^e	26.03 ^d
	56	20.82 ^c	22.57 ^{cd}	24.63 ^{de}	22.67 ^c
Means ¹		25.88 ^c	29.73 ^e	32.20 ^f	

100	1	37.20 ^{gh}	47.00 ^{ij}	56.30 ^k	46.83 ^j
	7	32.90 ^{fg}	40.63 ^h	48.53 ^j	40.69 ^h
	14	29.50 ^{ef}	38.43 ^h	44.00 ⁱ	37.31 ^g
	28	25.77 ^{de}	33.67 ^{fg}	36.78 ^{gh}	32.07 ^f
	56	22.00 ^{cd}	29.25 ^{ef}	32.63 ^{fg}	27.96 ^e
Means ₁		29.47 ^d	37.80 ^g	43.65 ^h	
200	1	65.93 ^{mn}	78.60 ^q	86.53 ^r	77.02 ⁿ
	7	62.70 ^{lm}	67.43 ⁿ	73.20 ^p	67.78 ^m
	14	56.07 ^k	59.77 ^l	63.53 ^m	59.79 ^l
	28	49.80 ^j	51.07 ^{jk}	54.07 ^k	51.65 ^k
	56	39.45 ^h	46.20 ^{ij}	46.83 ^{ij}	44.16 ⁱ
Means ¹		54.79 ⁱ	60.61 ^j	64.83 ^k	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.40$, $P.I/P.E/T = 3.14$, $PE = 1.81$] for Means^{1,2,3} respectively.

16. Effects of DMT-HFO extractions on the dilute hydrochloric acid extracted inorganic P (D/HCl-P_i) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	1746.35	436.59	446.54	<.01
INC/PER (I/P)	2	203.34	101.67	103.99	<.01
EX/TIME (E/T)	4	562.35	140.59	143.79	<.01
PHOSP.INC/PER (P.I/P)	8	51.51	6.44	6.59	<.01
PHOSP.EX/TIME (P.E/T)	16	134.13	8.38	8.57	<.01
INC/PER.EX/TIME (I/P.E/T)	8	23.34	2.92	2.98	0.04
PHOSP.INC/PER.EX/TIME	32	40.40	1.26	1.29	0.15
REPS	2	1.13	0.56	0.57	
Residual	150	146.66	0.98		
Total	224	2908.09			

SE = 0.99; CV = 11.0

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	6.13 ^{ab}	6.40 ^{ab}	6.65 ^{ab}	6.39 ^b
	7	4.87 ^{ab}	5.77 ^{ab}	6.30 ^{ab}	5.65 ^{ab}
	14	4.72 ^{ab}	5.55 ^{ab}	5.60 ^{ab}	5.29 ^{ab}
	28	4.50 ^{ab}	5.33 ^{ab}	5.50 ^{ab}	5.11 ^{ab}
	56	4.30 ^a	4.47 ^{ab}	5.30 ^{ab}	4.69 ^a
	Means ¹		4.90 ^a	5.50 ^{ab}	5.87 ^{ab}
25	1	7.90 ^{bc}	8.47 ^{bc}	9.13 ^{bc}	8.50 ^c
	7	6.80 ^{ab}	8.27 ^{bc}	7.63 ^{bc}	7.57 ^{bc}
	14	6.47 ^{ab}	7.10 ^b	7.47 ^{bc}	7.01 ^{bc}
	28	5.32 ^{ab}	6.13 ^{ab}	6.93 ^{ab}	6.13 ^{ab}
	56	4.93 ^{ab}	5.27 ^{ab}	6.30 ^{ab}	5.50 ^{ab}
	Means ¹		6.28 ^b	7.05 ^b	7.49 ^{bc}
50	1	8.77 ^{bc}	10.00 ^c	12.27 ^{cd}	10.35 ^d
	7	6.93 ^{ab}	9.87 ^c	11.00 ^{cd}	9.27 ^{cd}
	14	6.67 ^{ab}	7.60 ^{bc}	9.37 ^{bc}	7.88 ^{bc}
	28	6.00 ^{ab}	7.60 ^{bc}	8.37 ^{bc}	7.32 ^{bc}
	56	5.42 ^{ab}	7.17 ^{bc}	8.27 ^{bc}	6.95 ^{bc}
	Means ¹		6.76 ^b	8.45 ^c	9.86 ^d
100	1	12.80 ^d	14.80 ^{de}	16.02 ^e	14.54 ^f
	7	9.20 ^{bc}	12.73 ^d	13.40 ^{de}	11.78 ^{de}
	14	8.50 ^{bc}	10.53 ^{cd}	12.20 ^{cd}	10.41 ^d
	28	7.80 ^{bc}	9.47 ^{bc}	11.13 ^{cd}	9.47 ^{cd}
	56	7.00 ^{ab}	8.28 ^{bc}	10.60 ^{cd}	8.63 ^c
	Means ¹		9.06 ^{cd}	11.16 ^e	12.67 ^f
200	1	14.07 ^{de}	18.93 ^f	19.40 ^f	17.47 ^g
	7	12.33 ^{cd}	14.27 ^{de}	15.20 ^{de}	13.93 ^{ef}
	14	11.00 ^{cd}	12.20 ^{cd}	14.13 ^{de}	12.44 ^e
	28	9.67 ^{bc}	11.60 ^{cd}	13.00 ^d	11.42 ^{de}
	56	9.10 ^{bc}	10.17 ^{cd}	12.73 ^d	10.67 ^d
	Means ¹		11.23 ^e	13.43 ^f	14.89 ^g

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P.I/P = 1.21, P.I/P.E/T = 2.71, P.E/T = 1.56] for Means^{1,2,3} respectively.

17. The effects of DMT-HFO extractions on the concentrated hydrochloric acid extracted inorganic P (C/HCl-P_i) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	8481.59	2120.40	1186.76	<.01
INC/PER (I/P)	2	4246.39	2123.20	1188.33	<.01
EX/TIME (E/T)	4	2836.08	709.02	396.83	<.01
PHOSP.INC/PER (P.I/P)	8	1058.88	132.36	74.08	<.01
PHOSP.EX/TIME (P.E/T)	16	121.83	7.61	4.26	<.01
INC/PER.EX/TIME (I/P.E/T)	8	371.98	46.50	26.02	<.01
PHOSP.INC/PER.EX/TIME	32	138.89	4.34	2.43	<.01
REPS	2	3.70	1.85	1.03	
Residual	150	268.01	1.79		
Total	224	17523.65			

SE = 1.34; CV = 3.5

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIODS (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	31.10 ^{bc}	32.60 ^{bc}	38.00 ^d	33.90 ^d
	7	29.27 ^{ab}	30.00 ^{bc}	32.67 ^{bc}	30.65 ^{bc}
	14	27.87 ^{ab}	29.67 ^b	31.93 ^{bc}	29.82 ^{bc}
	28	26.20 ^{ab}	27.20 ^{ab}	29.67 ^b	27.69 ^{ab}
	56	25.87 ^a	26.13 ^{ab}	27.27 ^{ab}	26.42 ^a
	Means ¹		28.06 ^a	29.12 ^{ab}	31.91 ^{bc}
25	1	32.53 ^{bc}	34.67 ^{cd}	40.27 ^{de}	35.82 ^{de}
	7	30.33 ^{bc}	31.33 ^{bc}	35.33 ^{cd}	32.33 ^{cd}
	14	28.80 ^{ab}	30.00 ^{bc}	32.93 ^{bc}	30.58 ^{bc}
	28	27.33 ^{ab}	29.00 ^{ab}	30.93 ^{bc}	29.09 ^{bc}
	56	26.27 ^{ab}	26.60 ^{ab}	28.47 ^{ab}	27.11 ^{ab}
	Means ¹		29.05 ^{ab}	30.32 ^b	33.59 ^c
50	1	33.67 ^c	36.87 ^{cd}	41.93 ^e	37.49 ^e
	7	32.60 ^{bc}	34.47 ^{cd}	38.27 ^{de}	35.11 ^{de}
	14	30.53 ^{bc}	32.27 ^{bc}	34.93 ^{cd}	32.58 ^{cd}
	28	28.93 ^{ab}	31.53 ^{bc}	32.60 ^{bc}	31.02 ^c
	56	27.93 ^{ab}	28.33 ^{ab}	30.00 ^{bc}	28.75 ^b
	Means ¹		30.73 ^b	32.69 ^c	35.55 ^d

100	1	35.53 ^{cd}	40.13 ^{de}	48.47 ^{fg}	41.38 ^f
	7	34.60 ^{cd}	38.33 ^{de}	43.60 ^{ef}	38.84 ^e
	14	33.60 ^c	37.67 ^d	39.93 ^{de}	37.07 ^e
	28	31.27 ^{bc}	35.93 ^{cd}	35.93 ^{cd}	34.38 ^d
	56	30.60 ^{bc}	31.93 ^{bc}	33.67 ^c	32.07 ^{cd}
Means ¹		33.12 ^c	36.80 ^{de}	40.32 ^f	
200	1	40.53 ^{de}	50.27 ^g	59.27 ^h	50.02 ⁱ
	7	39.60 ^{de}	49.67 ^{fg}	58.00 ^h	49.09 ^{hi}
	14	37.93 ^d	48.67 ^{fg}	56.67 ^h	47.76 ^h
	28	36.27 ^{cd}	46.33 ^f	52.53 ^g	45.04 ^g
	56	34.77 ^{cd}	44.60 ^{ef}	50.33 ^g	43.23 ^{fg}
Means ¹		37.82 ^e	47.91 ^g	55.36 ^h	

N.B. Means with the same superscripts are not significantly different ($P = 0.001$) LSD (Fisher) [$P.I/P = 1.64$, $P.I/P.E/T = 3.66$, $P.E/T = 2.12$] for Means^{1,2,3} respectively.

18. The effects of DMT-HFO extractions on the concentrated sulphuric acid extracted residual P ($H_2SO_4-P_i$) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F
pr.					
PHOSP (P)	4	3268.75	817.19	951.47	<.01
INC/PER (I/P)	2	2975.79	1487.90	1732.40	<.01
EX/TIME (E/T)	4	1256.81	314.20	365.83	<.01
PHOSP.INC/PER (P.I/P)	8	1514.55	189.32	220.43	<.01
PHOSP.EX/TIME (P.E/T)	16	43.48	2.72	3.16	<.01
INC/PER.EX/TIME (I/P.E/T)	8	230.93	28.87	33.61	<.01
PHOSP.INC/PER.EX/TIME	32	114.67	3.58	4.17	<.01
REPS	2	3.84	1.92	2.27	
Residual	150	128.83	0.86		
Total	224	9533.81			

SE = 0.93; CV = 2.6

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	45.75 ^{hi}	47.00 ⁱ	47.75 ^{ij}	46.83 ⁱ
	7	34.33 ^{de}	35.17 ^e	41.48 ^g	36.99 ^f
	14	32.87 ^{de}	30.75 ^{cd}	35.00 ^e	32.87 ^d
	28	25.75 ^{ab}	28.67 ^{bc}	33.00 ^{de}	29.14 ^{bc}
	56	23.78 ^a	24.67 ^{ab}	30.75 ^{cd}	26.40 ^a
	Means ¹		32.50 ^a	33.25 ^a	37.60 ^c
25	1	46.92 ⁱ	49.00 ^{ij}	52.00 ^{jk}	49.31 ^j
	7	35.67 ^e	38.80 ^f	45.75 ^{hi}	40.07 ^g
	14	33.63 ^{de}	33.00 ^{de}	37.25 ^{ef}	34.63 ^e
	28	25.95 ^{ab}	30.08 ^c	34.00 ^{de}	30.01 ^c
	56	24.50 ^{ab}	25.83 ^{ab}	32.17 ^d	27.50 ^{ab}
	Means ¹		33.33 ^a	35.34 ^b	40.23 ^d
50	1	48.17 ^{ij}	51.33 ^{jk}	56.42 ^l	51.97 ^k
	7	36.33 ^{ef}	41.50 ^g	49.67 ^j	42.50 ^h
	14	34.87 ^e	38.25 ^f	44.25 ^h	39.12 ^g
	28	28.42 ^{bc}	31.92 ^{cd}	38.50 ^f	32.95 ^d
	56	25.68 ^{ab}	27.00 ^b	34.17 ^{de}	28.28 ^b
	Means ¹		34.69 ^b	38.00 ^c	44.20 ^f
100	1	50.67 ^{jk}	55.67 ^l	61.00 ^m	55.78 ^l
	7	39.67 ^{fg}	47.50 ^{ij}	54.08 ^{kl}	47.08 ⁱ
	14	37.60 ^{ef}	40.33 ^{fg}	50.67 ^{jk}	42.87 ^h
	28	33.58 ^{de}	34.42 ^{de}	46.00 ^h	38.00 ^{fg}
	56	29.58 ^c	30.50 ^{cd}	40.33 ^{fg}	33.47 ^{de}
	Means ¹		38.22 ^c	41.68 ^e	50.42 ^g
200	1	53.87 ^{kl}	64.83 ⁿ	75.33 ^q	64.68 ^m
	7	44.00 ^{gh}	57.00 ⁱ	73.08 ^q	58.03 ^m
	14	43.90 ^{gh}	53.00 ^k	68.42 ^p	55.11 ^l
	28	40.60 ^{fg}	47.87 ^{ij}	64.83 ⁿ	51.10 ^k
	56	37.22 ^{ef}	42.33 ^{gh}	62.67 ^{mn}	47.41 ⁱ
	Means ¹		43.92 ^f	53.01 ^h	68.87 ⁱ

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P.I/P = 1.14, P.I/P.E/T = 2.54, P.E/T = 1.47] for Means^{1,2,3} respectively.

19. The effects of DMT-HFO extractions on the bicarbonate extracted organic P ($-HCO_3-P_o$) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	1962.17	490.54	548.15	<.01
INC/PER (I/P)	2	65.36	32.68	36.52	<.01
EX/TIME (E/T)	4	1154.12	288.53	322.42	<.01
PHOSP.INC/PER (P.I/P)	8	49.02	6.13	6.85	<.01
PHOSP.EX/TIME (P.E/T)	16	173.55	10.85	12.12	<.01
INC/PER.EX/TIME (I/P.E/T)	8	325.84	40.73	45.51	<.01
PHOSP.INC/PER.EX/TIME	32	150.28	4.70	5.25	<.01
REPS	2	0.08	0.04	0.04	
Residual	150	134.24	0.89		
Total	224	4014.59			

SE = 0.95; CV = 10.9

(ii) Table of means

ADDED.P. (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIODS (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	7.07 ^c	6.93 ^c	6.00 ^{bc}	6.67 ^{cd}
	7	4.63 ^{bc}	4.03 ^{ab}	4.63 ^{bc}	4.43 ^{bc}
	14	3.13 ^{ab}	3.53 ^{ab}	3.43 ^{ab}	3.36 ^b
	28	2.87 ^{ab}	2.00 ^{ab}	2.07 ^{ab}	2.31 ^{ab}
	56	1.53 ^a	1.50 ^a	2.05 ^{ab}	1.69 ^a
	Means ¹		3.85 ^a	3.60 ^a	3.64 ^a
25	1	8.00 ^{cd}	11.17 ^{de}	8.43 ^{cd}	9.20 ^{ef}
	7	5.70 ^{bc}	6.40 ^{bc}	7.27 ^c	6.46 ^{cd}
	14	4.27 ^b	5.58 ^{bc}	6.40 ^{bc}	5.42 ^c
	28	2.97 ^{ab}	3.00 ^{ab}	4.63 ^{bc}	3.53 ^b
	56	1.77 ^{ab}	2.17 ^{ab}	3.50 ^{ab}	2.48 ^{ab}
	Means ¹		4.54 ^{ab}	5.66 ^b	6.05 ^b
50	1	8.47 ^{cd}	11.67 ^{de}	10.93 ^{de}	10.36 ^f
	7	4.90 ^{bc}	6.93 ^c	8.37 ^{cd}	6.73 ^{cd}
	14	4.50 ^{bc}	5.33 ^{bc}	7.07 ^c	5.63 ^{cd}
	28	3.07 ^{ab}	4.03 ^{ab}	5.33 ^{bc}	4.14 ^{bc}
	56	2.50 ^{ab}	3.00 ^{ab}	4.77 ^{bc}	3.42 ^b
	Means ¹		4.69 ^{ab}	6.19 ^{bc}	7.29 ^c

100	1	9.93 ^d	13.20 ^e	11.10 ^{de}	11.41 ^{fg}
	7	7.87 ^{cd}	8.77 ^{cd}	9.18 ^{cd}	11.94 ^g
	14	6.57 ^{bc}	6.53 ^{bc}	8.07 ^{cd}	7.06 ^d
	28	5.50 ^{bc}	4.80 ^{bc}	7.40 ^{cd}	5.90 ^{cd}
	56	4.00 ^{ab}	3.67 ^{ab}	6.00 ^{bc}	4.56 ^{bc}
Means ¹		6.77 ^{bc}	7.39 ^c	10.35 ^e	
200	1	10.80 ^{de}	13.65 ^e	12.77 ^e	12.41 ^g
	7	8.00 ^{cd}	10.90 ^{de}	11.32 ^{de}	10.07 ^{ef}
	14	7.20 ^c	8.33 ^{cd}	10.20 ^{de}	8.58 ^e
	28	6.53 ^{bc}	5.97 ^{bc}	8.63 ^{cd}	7.04 ^d
	56	5.00 ^{bc}	4.80 ^{bc}	7.77 ^{cd}	5.86 ^{cd}
Means ¹		7.51 ^c	8.73 ^d	10.14 ^e	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.16$, $P.I/P.E/T = 2.59$, $P.E/T = 1.50$] for Means^{1,2,3} respectively.

20. The effects of DMT-HFO extractions on the hydroxide extracted organic P (-OH-P_o) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	3433.91	858.48	654.59	<.01
INC/PER (I/P)	2	127.35	63.68	48.55	<.01
EX/TIME (E/T)	4	845.08	211.27	161.09	<.01
PHOSP.INC/PER (P.I/P)	8	207.03	25.88	19.73	<.01
PHOSP.EX/TIME (P.E/T)	16	73.74	4.61	3.51	<.01
INC/PER.EX/TIME (I/P.E/T)	8	122.41	15.30	11.67	<.01
PHOSP.INC/PER.EX/TIME	32	72.69	2.27	1.73	0.02
REPS	2	1.48	0.74	0.56	
Residual	150	196.72	1.31		
Total	224	5078.94			

SE = 1.15; CV = 8.7

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS		INCUBATION PERIOD (DAYS)			Means ³
	Days	1 ²	120 ²	240 ²		
0	1	9.20 ^c	8.13 ^{bc}	7.11 ^{bc}	8.15 ^{bc}	
	7	7.10 ^{bc}	6.07 ^{bc}	6.93 ^{bc}	6.70 ^b	
	14	6.35 ^{bc}	4.97 ^{ab}	6.22 ^{bc}	5.85 ^{ab}	
	28	5.00 ^{ab}	4.33 ^{ab}	5.00 ^{ab}	4.78 ^{ab}	
	56	4.77 ^{ab}	2.83 ^a	4.70 ^{ab}	4.10 ^a	
Means ¹		6.48 ^{ab}	5.27 ^a	5.99 ^{ab}		
25	1	11.93 ^{cd}	10.20 ^{cd}	9.17 ^{bc}	10.43 ^{cd}	
	7	9.47 ^{cd}	8.20 ^{bc}	8.27 ^{bc}	8.65 ^c	
	14	8.97 ^{bc}	6.13 ^{bc}	7.88 ^{bc}	7.66 ^{bc}	
	28	6.53 ^{bc}	5.37 ^{ab}	7.15 ^{bc}	6.35 ^b	
	56	6.62 ^{bc}	4.32 ^{ab}	6.03 ^b	5.66 ^{ab}	
Means ¹		8.70 ^b	6.84 ^b	7.70 ^b		
50	1	12.43 ^d	11.40 ^{cd}	11.43 ^{cd}	11.75 ^d	
	7	10.30 ^{cd}	10.07 ^{cd}	10.57 ^{cd}	10.31 ^{cd}	
	14	9.57 ^{cd}	8.50 ^{bc}	8.78 ^{bc}	8.95 ^c	
	28	8.27 ^{bc}	6.53 ^{bc}	7.83 ^{bc}	7.54 ^{bc}	
	56	7.92 ^{bc}	5.37 ^{ab}	7.37 ^{bc}	6.72 ^b	
Means ¹		9.60 ^{bc}	8.37 ^b	9.20 ^b		
100	1	13.53 ^{de}	14.27 ^{de}	14.40 ^{de}	14.07 ^e	
	7	11.30 ^{cd}	12.17 ^{cd}	12.40 ^d	11.96 ^d	
	14	10.80 ^{cd}	10.83 ^{cd}	10.67 ^{cd}	10.77 ^d	
	28	9.50 ^{cd}	9.13 ^{bc}	8.88 ^{bc}	9.17 ^{cd}	
	56	8.00 ^{bc}	8.35 ^{bc}	8.30 ^{bc}	8.22 ^{bc}	
Means ¹		10.63 ^c	10.95 ^{cd}	10.93 ^{cd}		
200	1	15.13 ^{de}	17.07 ^e	15.93 ^e	16.04 ^f	
	7	13.83 ^{de}	14.83 ^{de}	14.37 ^{de}	14.34 ^e	
	14	11.47 ^{cd}	12.80 ^{de}	12.07 ^{cd}	12.11 ^d	
	28	10.80 ^{cd}	11.60 ^{cd}	11.53 ^{cd}	11.31 ^d	
	56	10.02 ^{cd}	10.40 ^{cd}	10.83 ^{cd}	10.42 ^{cd}	
Means ¹		12.25 ^d	13.34 ^d	12.95 ^d		

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.40$, $P.I/P.E/T = 3.14$, $P.E/T = 1.81$] for Means^{1,2,3} respectively.

21. The effects of DMT-HFO extractions on the concentrated hydrochloric acid extracted organic P (C/HCl-P_o) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	794.39	198.60	234.48	<.01
INC/PER (I/P)	2	365.47	182.74	215.75	<.01
EX/TIME (E/T)	4	191.48	47.87	56.52	<.01
PHOSP.INC/PER (P.I/P)	8	126.47	15.81	18.67	<.01
PHOSP.EX/TIME (P.E/T)	16	51.72	3.23	3.82	<.01
INC/PER.EX/TIME (I/P.E/T)	8	53.52	6.69	7.90	<.01
PHOSP.INC/PER.EX/TIME	32	37.30	1.17	1.38	0.11
REPS	2	0.27	0.13	0.16	
Residual	150	127.05	0.85		
Total	224	1747.40			

SE = 0.92; CV = 12.4

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS Days	INCUBATION PERIOD (DAYS)			Means ³
		1 ²	120 ²	240 ²	
0	1	5.07 ^{bc}	5.40 ^{bc}	6.40 ^{bc}	5.62 ^{bc}
	7	3.93 ^{ab}	4.33 ^{ab}	4.93 ^{bc}	4.40 ^b
	14	2.80 ^{ab}	4.00 ^{ab}	4.27 ^{ab}	3.69 ^{ab}
	28	2.40 ^{ab}	3.67 ^{ab}	3.20 ^{ab}	3.09 ^{ab}
	56	2.23 ^a	3.53 ^{ab}	2.67 ^{ab}	2.81 ^a
Means ¹		3.29 ^a	4.19 ^{ab}	4.29 ^{ab}	
25	1	5.97 ^{bc}	6.27 ^{bc}	7.07 ^{bc}	6.44 ^c
	7	4.33 ^{ab}	5.50 ^{bc}	6.00 ^{bc}	5.28 ^{bc}
	14	3.07 ^{ab}	5.08 ^{bc}	5.67 ^{bc}	4.61 ^{bc}
	28	2.67 ^{ab}	4.50 ^{ab}	4.50 ^{ab}	3.89 ^{ab}
	56	2.40 ^{ab}	4.00 ^{ab}	4.13 ^{ab}	3.51 ^{ab}
Means ¹		3.69 ^a	5.07 ^b	5.47 ^{bc}	
50	1	6.17 ^{bc}	7.63 ^{cd}	10.93 ^d	8.24 ^d
	7	4.73 ^{ab}	7.20 ^{bc}	8.33 ^{cd}	6.75 ^{cd}
	14	3.90 ^{ab}	6.80 ^{bc}	7.33 ^c	6.01 ^c
	28	3.50 ^{ab}	5.60 ^{bc}	6.40 ^{bc}	5.17 ^{bc}
	56	3.20 ^{ab}	5.00 ^{bc}	5.33 ^{bc}	4.51 ^b
Means ¹		4.30 ^{ab}	6.45 ^c	7.66 ^d	

100	1	6.50 ^{bc}	10.57 ^d	12.20 ^{de}	9.76 ^e
	7	5.35 ^{bc}	9.00 ^{cd}	10.07 ^d	8.14 ^d
	14	4.80 ^b	8.00 ^{cd}	8.73 ^{cd}	7.18 ^{cd}
	28	4.07 ^{ab}	6.93 ^{bc}	7.33 ^c	6.11 ^c
	56	3.87 ^{ab}	6.07 ^{bc}	6.33 ^{bc}	5.42 ^{bc}
Means ¹		4.92 ^b	8.11 ^{de}	8.93 ^e	
200	1	7.47 ^c	13.48 ^e	12.47 ^{de}	11.14 ^e
	7	6.50 ^{bc}	11.00 ^{de}	10.60 ^d	9.37 ^{de}
	14	6.00 ^{bc}	9.67 ^{cd}	9.27 ^{cd}	8.31 ^{de}
	28	5.00 ^{bc}	8.00 ^{cd}	8.47 ^{cd}	7.16 ^{cd}
	56	4.57 ^{ab}	7.00 ^{bc}	8.27 ^{cd}	6.61 ^c
Means ¹		5.91 ^{bc}	9.83 ^e	9.82 ^e	

N.B. Means with the same superscripts are not significantly different ($P = 0.01$) LSD (Fisher) [$P.I/P = 1.13$, $P.I/P.E/T = 2.52$, $P.E/T = 1.46$] for Means^{1,2,3} respectively.

22. The effects of DMT-HFO extractions on the extracted total organic P (TOT-P_o) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	17135.48	4283.87	1436.79	<.01
INC/PER (I/P)	2	1139.91	569.95	191.16	<.01
EX/TIME (E/T)	4	5888.81	1472.20	493.77	<.01
PHOSP.INC/PER (P.I/P)	8	854.80	106.85	35.84	<.01
PHOSP.EX/TIME (P.E/T)	16	685.15	42.82	14.36	<.01
INC/PER.EX/TIME (I/P.E/T)	8	952.53	119.07	39.93	<.01
PHOSP.INC/PER.EX/TIME	32	526.38	16.45	5.52	<.01
REPS	2	0.63	0.31	0.10	
Residual	150	447.23	2.98		
Total	224	27630.29			

SE = 1.73; CV = 5.9

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	23.33 ^c	20.47 ^{bc}	22.51 ^{bc}	22.10 ^c
	7	20.67 ^{bc}	17.93 ^b	19.50 ^{bc}	19.37 ^{bc}
	14	19.28 ^{bc}	15.50 ^{ab}	16.85 ^{ab}	17.21 ^b
	28	17.27 ^{ab}	15.37 ^{ab}	16.33 ^{ab}	16.32 ^{ab}
	56	14.53 ^{ab}	13.17 ^a	15.43 ^{ab}	14.38 ^a
	Means ¹		19.02 ^b	16.49 ^a	18.12 ^{ab}
25	1	25.90 ^{cd}	29.63 ^d	30.67 ^{de}	28.74 ^e
	7	24.50 ^{cd}	21.60 ^{bc}	26.53 ^{cd}	24.21 ^d
	14	21.30 ^{bc}	19.37 ^{bc}	23.28 ^c	21.32 ^c
	28	20.17 ^{bc}	18.82 ^{bc}	20.45 ^{bc}	19.81 ^{bc}
	56	17.78 ^{ab}	15.48 ^{ab}	18.77 ^{bc}	17.34 ^b
	Means ¹		21.93 ^c	20.98 ^{bc}	23.94 ^c
50	1	28.07 ^d	39.70 ^{fg}	44.30 ^g	37.36 ^{gh}
	7	30.93 ^{de}	28.20 ^d	36.27 ^{ef}	31.80 ^f
	14	28.47 ^d	24.63 ^{cd}	32.18 ^{de}	28.43 ^e
	28	24.40 ^{cd}	21.37 ^{bc}	28.57 ^d	24.78 ^d
	56	19.82 ^{bc}	18.27 ^b	22.47 ^{bc}	20.18 ^c
	Means ¹		26.34 ^d	26.43 ^d	32.76 ^e
100	1	31.97 ^{de}	50.03 ^h	49.70 ^h	43.90 ⁱ
	7	36.90 ^{ef}	37.93 ^{ef}	43.65 ^{fg}	39.49 ^h
	14	34.57 ^e	34.37 ^e	39.47 ^f	36.13 ^g
	28	31.67 ^{de}	30.87 ^{de}	34.62 ^e	32.38 ^f
	56	24.57 ^{cd}	23.68 ^{cd}	26.63 ^{cd}	24.96 ^d
	Means ¹		31.93 ^e	35.38 ^f	38.81 ^g
200	1	34.40 ^e	58.20 ⁱ	59.17 ⁱ	50.59 ^k
	7	41.47 ^{fg}	48.73 ^{gh}	53.28 ^h	47.83 ^j
	14	37.67 ^{ef}	41.80 ^{fg}	48.53 ^{gh}	42.67 ⁱ
	28	36.07 ^{ef}	34.57 ^e	43.63 ^{fg}	38.09 ^{gh}
	56	29.08 ^d	29.20 ^d	34.87 ^{ef}	31.05 ^f
	Means ¹		35.74 ^f	42.50 ^h	47.90 ⁱ

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P.I/P = 2.12, P.I/P.E/T = 4.73, P.E/T = 2.73] for Means^{1,2,3} respectively.

23. The effects of DMT-HFO extractions on the extracted total inorganic P (TOT-P_i) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f.	s.s.	m.s.	F	F pr.
PHOSP (P)	4	915358.86	228839.72	3.98E+04	<.01
INC/PER (I/P)	2	3443.02	1721.51	299.36	<.01
EX/TIME (E/T)	4	17923.60	4480.90	779.21	<.01
PHOSP.INC/PER (P.I/P)	8	1455.68	181.96	31.64	<.01
PHOSP.EX/TIME (P.E/T)	16	1157.20	72.33	12.58	<.01
INC/PER.EX/TIME	8	1097.25	137.16	23.85	<.01
PHOSP.INC/PER.EX/TIME	32	2059.56	64.36	11.19	<.01
REPS	2	48.12	24.06	4.37	
Residual	150	862.58	5.75		
Total	224	943357.74			

SE = 2.40; CV = 1.3

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	113.2 ^{cd}	119.0 ^{de}	128.7 ^{ef}	120.3 ^e
	7	108.7 ^c	111.2 ^{cd}	117.2 ^d	112.4 ^d
	14	103.5 ^{bc}	104.5 ^{bc}	110.5 ^c	106.2 ^c
	28	99.3 ^{ab}	99.7 ^{ab}	104.2 ^{bc}	101.1 ^b
	56	93.8 ^a	93.3 ^a	100.6 ^b	95.9 ^a
	Means ¹		103.7 ^a	105.5 ^a	112.3 ^b
25	1	145.3 ^{gh}	146.6 ^{gh}	156.1 ⁱ	149.3 ⁱ
	7	128.9 ^{ef}	137.8 ^{fg}	148.2 ^h	138.3 ^h
	14	127.0 ^{ef}	132.5 ^f	144.1 ^{gh}	134.5 ^g
	28	130.2 ^{ef}	129.5 ^{ef}	141.3 ^g	133.7 ^g
	56	125.0 ^e	124.5 ^e	131.9 ^f	127.1 ^f
	Means ¹		131.3 ^c	134.2 ^c	144.3 ^d
50	1	171.8 ^j	178.7 ^k	192.3 ^l	180.9 ^m
	7	161.5 ⁱ	162.0 ⁱ	183.7 ^k	169.1 ^l
	14	156.0 ⁱ	161.9 ⁱ	170.8 ^j	162.9 ^k
	28	151.0 ^{hi}	148.4 ^h	157.9 ⁱ	152.4 ^j
	56	143.7 ^{gh}	149.2 ^h	154.5 ^{hi}	149.1 ⁱ
	Means ¹		156.8 ^e	160.0 ^f	171.8 ^g

100	1	228.6 ^q	220.3 ^{pq}	229.6 ^q	226.2 ^q
	7	210.2 ^{np}	207.8 ⁿ	223.6 ^q	213.9 ^p
	14	202.4 ^{mn}	205.5 ^{mn}	210.9 ^{np}	206.3 ⁿ
	28	203.5 ^{mn}	208.1 ^{np}	208.4 ^{np}	206.7 ⁿ
	56	199.5 ^m	214.6 ^p	195.9 ^{lm}	203.3 ⁿ
Means ¹		208.8 ^h	211.3 ^{g^{hi}}	213.7 ⁱ	
200	1	322.6 ^u	290.6 ^s	310.6 ^t	307.9 ^t
	7	289.6 ^s	281.8 ^r	293.7 ^s	288.4 ^s
	14	282.2 ^r	281.7 ^r	294.7 ^s	286.2 ^s
	28	281.3 ^r	283.0 ^r	283.5 ^{rs}	282.6 ^r
	56	282.2 ^r	277.9 ^r	280.8 ^r	280.3 ^r
Means ¹		291.6 ^k	283.0 ^j	292.7 ^k	

N.B. Means with the same superscripts are not significantly different ($P = 0.001$) LSD (Fisher) [P.I/P = 2.94, P.I/P.E/P = 6.57, P.E/T = 3.79] for Means^{1,2,3} respectively.

24. The effects of DMT-HFO extractions on the extracted total soil P (TOT-P) of Loskop soil as influenced by added P and incubation period.

(i). Analysis of variance

Source of variation	d.f. (m.v.)	s.s.	m.s.	F	F pr.
PHOSP (P)	4	1.18E+06	2.95E+05	7.91E+04	<.01
INC/PER (I/P)	2	8.52E+03	4.26E+03	1142.21	<.01
EX/TIME (E/T)	4	4.35E+04	1.09E+04	2912.87	<.01
PHOSP.INC/PER (P.I/P)	8	1.20E+03	1.49E+02	40.07	<.01
PHOSP.EX/TIME (P.E/P)	16	1.78E+03	1.11E+02	29.81	<.01
INC/PER.EX/TIME (I/P.E/T)	8	1.43E+03	1.79E+02	48.00	<.01
PHOSP.INC/PER.EX/TIME	32	1.56E+03	4.86E+01	13.03	<.01
REPS	2	3.20E+01	1.60E+01	4.48	
Residual	149(1)	5.56E+02	3.73E+00		
Total	223(1)	1.23E+06			

SE = 1.93; CV = 0.9

(ii). Table of means

ADDED P (mg kg ⁻¹)	DMT-HFO EXTRACTIONS	INCUBATION PERIOD (DAYS)			
		Days	1 ²	120 ²	240 ²
0	1	136.5 ^e	139.5 ^{ef}	151.2 ^g	142.4 ^e
	7	127.0 ^d	125.8 ^{cd}	136.7 ^e	129.8 ^d
	14	122.7 ^{cd}	120.0 ^{bc}	127.4 ^d	123.4 ^c
	28	116.5 ^{bc}	115.0 ^b	120.6 ^c	117.4 ^b
	56	108.4 ^a	106.5 ^a	116.0 ^{bc}	110.3 ^a
	Means ¹		122.2 ^a	121.36 ^a	130.4 ^b
25	1	171.2 ^{ij}	176.2 ^j	186.7 ^{kl}	178.1 ⁱ
	7	153.4 ^g	159.4 ^h	174.7 ^j	162.5 ^g
	14	148.3 ^g	151.8 ^g	167.3 ⁱ	155.8 ^f
	28	150.3 ^g	148.3 ^g	161.8 ^h	153.5 ^f
	56	142.7 ^f	140.0 ^{ef}	150.7 ^g	144.5 ^e
	Means ¹		153.2 ^c	155.2 ^c	168.2 ^d
50	1	199.8 ^m	218.4 ⁿ	236.6 ^q	218.3 ^l
	7	192.4 ^l	190.2 ^l	220.0 ^{np}	200.9 ^k
	14	184.5 ^k	186.6 ^{kl}	203.0 ^m	191.3 ^j
	28	175.4 ^j	169.7 ^{ij}	186.5 ^{kl}	177.2 ⁱ
	56	163.5 ^{hi}	167.5 ⁱ	177.0 ^j	169.3 ^h
	Means ¹		183.1 ^e	186.5 ^f	204.6 ^g
100	1	260.6 ^t	270.4 ^u	279.3 ^v	270.1 ^r
	7	247.1 ^{rs}	245.8 ^{rs}	267.3 ^u	253.4 ^q
	14	237.0 ^q	239.9 ^{qr}	250.4 ^s	242.4 ^p
	28	235.1 ^q	239.0 ^{qr}	242.4 ^r	238.8 ⁿ
	56	224.0 ^p	238.3 ^{qr}	222.6 ^{np}	228.3 ^m
	Means ¹		240.8 ^h	246.6 ⁱ	252.4 ^j
200	1	357.0 ^C	348.8 ^B	369.7 ^D	358.5 ^w
	7	331.0 ^z	330.6 ^z	347.0 ^{AB}	336.2 ^v
	14	319.8 ^{xy}	323.5 ^y	343.2 ^A	328.9 ^u
	28	317.4 ^x	317.6 ^x	327.2 ^{yz}	320.7 ^t
	56	311.3 ^{wx}	307.1 ^w	315.3 ^x	311.2 ^s
	Means ¹		327.3 ^k	325.5 ^k	340.5 ^l

N.B. Means with the same superscripts are not significantly different (P = 0.01) LSD (Fisher) [P.I/P = 2.37, P.I/P.E/T = 5.29, P.E/T = 3.06] for Means^{1,2,3} respectively.



25. A copy of Genstat 5 Release 4.1 computer programme used in the statistical analysis of Rustenburg and Loskop soils data.

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Genstat 5 Release 4.1 (PC/Windows 95) 18 May 2001 16:00:50
Copyright 1997, Lawes Agricultural Trust (Rothamsted Experimental Station)
1 JOB 'PHOSPHORUS BINDING IN RUSTENBURG RED CLAY'
2 "ON NETWORK H:\HOME\VICTOR as XRUST2.DAT; XRUST2.OUT"
3 UNITS [NVALUES=225]
4 FACTOR [LEVEL=5;LABEL=!T('0','25','50','100','200')] PHOSP
5 FACTOR [LEVEL=3;LABEL=!T('0','120','240')] INCPER
6 FACTOR [LEVELS=5;LABEL=!T(DAY1, DAY7, DAY14, DAY28, DAY56)] EXTIME
7 FACTOR [LEVELS=3] REPS
8 OPEN 'A:XRUST2.DAT';WIDTH=160;FILETYPE=INPUT;CHAN=4
9 READ[CHAN=4]
BOT, PHOSP, REPS, INCPER, EXTIME, HFOpI, HCOpI, OHpI, DHClpI, CHClpI, HSOpI, \
10 HCOpT, OHpT, CHClpT, HCOpO, OHpO, CHClpO, TOTpO, TOTpI, TOTP
Identifier Minimum Mean Maximum Values Missing
BOT 1.0 113.0 225.0 225 0
HFOpI 2.00 24.56 91.60 225 0
HCOpI 1.50 12.97 70.50 225 0
OHpI 8.50 51.62 106.70 225 0
DHClpI 4.00 12.50 30.80 225 0
CHClpI 34.00 53.88 91.80 225 0
HSOpI 35.25 59.01 99.25 225 0
HCOpT 5.00 22.78 86.00 225 0
OHpT 16.00 68.21 140.20 225 0
CHClpT 41.00 64.54 112.00 225 0
HCOpO 2.800 9.804 23.900 225 0
OHpO 5.60 16.59 34.60 225 0
CHClpO 5.00 10.66 21.00 225 0
TOTpO 16.85 37.00 74.80 225 1
TOTpI 101.7 214.0 352.5 225 1
TOTP 124.5 251.6 424.6 225 0
Identifier Values Missing Levels
PHOSP 225 0 5
REPS 225 0 3
INCPER 225 0 3
EXTIME 225 0 5
11 BLOCK REPS.PHOSP.INCPER.EXTIME .
12 TREAT PHOSP*INCPER*EXTIME
13 FOR Y=HFOpI, HCOpI, OHpI, DHClpI, CHClpI, HSOpI, OHpT, CHClpT, \
14 HCOpT, HCOpO, OHpO, CHClpO, TOTpO, TOTpI, TOTP
15 ANOVA [PRINT=AOVTABLE, INFO, MEANS, %CV; FPROB=YES; PSE=LSD, MEAN] Y; \
16 RESIDUALS=RES; FITTEDVALUES=FIT
17 TABULATE [CLASS=PHOSP, INCPER, EXTIME] Y; MEANS=MTAB
18 PRINT MTAB; FIELD=10; DECI=2
19 TABULATE [PRINT=MEAN; CLASS=PHOSP, EXTIME, INCPER] Y
20 CALC ST_RES=RES/(SQRT(VAR(RES)))
21 GRAPH [NROWS=10; NCOL=25] ST_RES; FIT
22 HIST ST_RES
23 PRINT 'TEST FOR NORMALITY'
24 NORMTEST [PRINT=m, s, c] ST_RES
25 PRINT 'TEST HOMOGENEITY OF PHOSPHATE LEVELS'
26 VHOMOGENITY [GROUPS=PHOSP] Y
27 PRINT 'TEST HOMOGENEITY OF EXTIME'
28 VHOMOGENITY [GROUPS=EXTIME] Y
29 PRINT 'TEST HOMOGENEITY OF INCPER'
30 VHOMOGENITY [GROUPS=INCPER] Y
31 PRINT
BOT, PHOSP, REPS, INCPER, EXTIME, Y, FIT, ST_RES; DECI=5(0), 3(3); FIELD=10
32 ENDFOR

```