

Supplementary materials

Critical assessment of soil fertility characteristics of long-term chemical fertilized coconut palm fields in India: a sustainability perspective

Sreejamol T. Nadesan*, Joseph George Ray**

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Supplementary Table 1 Morphological characteristics of coconut varieties (Subramanian et al. 2018)

Coconut varieties	Morphological characteristics
WCT (West Coast Tall)	• Height - 15 to 18m • Fruit color is green to greenish yellow to different shades of brown • Fruit shape is varying from oval to oblong
COD (Chowghat Orange Dwarf)	• Height - 5 to 7m • Thin stem with closely arranged leaf scars • Small compact crown with characteristic orange color on leaf petioles, inflorescence and nuts. • Spherical shaped nuts with medium size
CGD (Chowghat Green Dwarf)	• Height - 5 to 7m • The leaf petioles, leaves and nuts are dark green in color • Oblong shaped nuts • The nuts with characteristics ‘beak’ when fully mature

Supplementary Table 2 Visible characteristics features of healthy and root wilt disease (RWD) affected coconut palms (Rajendran et al. 2019)

Healthy palms	RWD affected palms
• Healthy normal leaves • Absence of foliar yellowing and marginal necrosis • Mature nuts with proper size	• Flaccidity of leaflets • Yellowing of leaflets of outer leaves (foliar yellowing) • Marginal necrosis • Reduced leaf number • Reduced size and number of nuts • Abnormal shedding of immature nuts

Supplementary Table 3 Sampling fields, Varieties and the GPS coordinates

Field No.	Varieties	Geographical coordinates
1	WCT	9°14'42"N to 76°32'14"E
2	WCT	9°16'17"N to 76°31'05"E
3	WCT, COD	9°15'12"N to 76°31'57"E
4	WCT	9°14'46"N to 76°30'06"E
5	WCT	9°15'32"N to 76°27'07"E
6	WCT, CGD	9°14'30"N to 76°28'28"E
7	WCT	9°17'01"N to 76°27'04"E
8	WCT	9°14'27"N to 76°29'14"E
9	WCT, COD, CGD	9°18'04"N to 76°26'56"E
10	CGD	9°19'06"N to 76°26'11"E
11	WCT, COD	9°29'03"N to 76°20'33"E
12	WCT	9°31'09"N to 76°19'55"E
13	WCT	9°37'28"N to 76°19'24"E
14	COD	9°36'04"N to 76°18'47"E
15	WCT, CGD	9°43'53"N to 76°19'03"E
16	WCT	9°42'27"N to 76°19'12"E
17	WCT	9°43'21"N to 76°20'24"E
18	COD, CGD	9°43'46"N to 76°18'26"E
19	WCT	9°10'34"N to 76°32'21"E
20	WCT	9°11'39"N to 76°32'44"E
21	WCT	9°10'32"N to 76°31'12"E
22	WCT	9°40'52"N to 76°36'28"E
23	WCT	9°43'05"N to 76°36'58"E
24	WCT	9°45'55"N to 76°35'44"E

25	WCT	9°46'15"N to 76°25'22"E
26	WCT	9°46'30"N to 76°24'24"E
27	WCT, COD, CGD	9°44'12"N to 76°24'58"E
28	WCT	9°42'02"N to 76°46'56"E
29	WCT	9°43'04"N to 76°46'45"E
30	WCT	9°41'30"N to 76°46'41"E
31	CGD	9°42'01"N to 76°48'51"E
32	COD	9°41'18"N to 76°47'20"E
33	WCT	9°33'27"N to 76°47'13"E
34	WCT	9°34'43"N to 76°50'02"E
35	WCT	9°33'14"N to 76°46'55"E
36	COD, CGD	9°33'01"N to 76°52'11"E
37	WCT	9°40'23"N to 76°33'49"E
38	WCT, COD, CGD	9°36'07"N to 76°30'21"E
39	WCT	9°35'40"N to 76°28'53"E
40	WCT	9°33'15"N to 76°31'02"E
41	WCT	9°31'16"N to 76°31'30"E
42	WCT	9°30'01"N to 76°31'51"E
43	WCT, COD	10°34'50"N to 76°02'03"E
44	WCT, COD, CGD	10°35'09"N to 76°01'14"E
45	WCT, COD, CGD	10°34'58"N to 76°01'08"E
46	CGD	10°35'07"N to 76°03'44"E
47	WCT	8°34'40"N to 76°51'47"E
48	WCT, CGD	8°35'15"N to 76°52'55"E
49	WCT, COD, CGD	8°40'33"N to 77°05'43"E
50	CGD, COD	8°38'43"N to 77°03'13"E
51	COD	8°38'24"N to 77°04'58"E
52	WCT	12°04'08"N to 75°12'51"E
53	WCT	12°04'05"N to 75°11'44"E
54	WCT	12°06'52"N to 75°16'41"E

55	WCT	12°05'20"N to 75°16'35"E
56	WCT	12°06'43"N to 75°17'44"E
57	WCT	12°05'20"N to 75°17'40"E
58	WCT	12°01'02"N to 75°21'22"E
59	WCT	12°01'05"N to 75°22'15"E
60	WCT	12°00'55"N to 75°21'16"E
61	WCT	12°00'14"N to 75°20'18"E

*Coconut Varieties: WCT (West Coast Tall), COD (Chowghat Orange Dwarf), CGD (Chowghat Green Dwarf).

Supplementary Table 4 Different soil orders of coconut cultivated fields in Kerala

Sl No.	Soil orders	Sub groups	Soil series	Coconut varieties cultivated
1	Ultisols	Typic plinthohumults	Arathil	WCT
		Ustic Haplohumults	Kottapuram	WCT
		Ustic Haplohumults	Nedumangad	WCT, COD, CGD
2	Entisols	Oxyaquic Ustifluvents	Narikkot	WCT
		Ustic Quartzipsamments	Manathala	WCT, COD, CGD
		Thapto-HisticTropic Fluvaquents	Manjoor	WCT, COD, CGD
			Punnapra	WCT, COD, CGD
		Oxyaquic Quartzipsamments		
			Champakulam	WCT, COD, CGD
		Typic Hydraquents		
		Oxyaquic Quartzipsamments	Mannar	WCT, COD, CGD
		Typic Ustifluvents	Kazhakuttam	WCT
3	Inceptisols	Aquic Ustifluvents	Amaravila	WCT, CGD
		Fluventic Dystrustepts	Parampuzha	WCT, COD, CGD
		Oxic Dystrustepts	Paippara	WCT, COD, CGD

4	Spodosols	Oxyaquic Haplorthods	Alappuzha	WCT, CGD
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*Coconut Varieties: WCT (West Coast Tall), COD (Chowghat Orange Dwarf), CGD (Chowghat Green Dwarf).

Supplementary Table 5 The range and statistical details of different soil parameters of the entire soil samples (248) collected from 61 coconut fields in two seasons (Summer and Monsoon) of Kerala

Sample No.	Soil pH		FWC (%)		TOC (%)		SAN (kg ha ⁻¹)		SAP (kg ha ⁻¹)		SAK (kg ha ⁻¹)	
	Summer	Monsoon	Summer	Monsoon	Summer	Monsoon	Summer	Monsoon	Summer	Monsoon	Summer	Monsoon
1	4.34	6.73	17.17	26.28	1.2	0.91	177.33	158.67	21.48	20.87	94.90	168.00
2	6.93	6.86	14.72	10.86	3.08	0.49	242.67	102.67	21.78	33.95	107.24	114.05
3	6.33	6.51	18.28	27.85	2.13	0.5	200.67	84	17.57	19.41	95.09	73.17
4	6.44	5.31	2.93	7.29	1.32	0.7	154	70	76.43	32.57	224.00	100.80
5	6.94	8.07	5.23	8.59	0.65	0.44	102.67	74.67	35.63	34.87	255.10	122.08
6	6.34	4.62	3.43	8.17	0.56	0.62	56	56	47.08	50.05	95.20	123.20
7	5.14	6.48	8.37	20.78	1.44	0.94	149.33	210	18.77	22.49	147.11	66.08
8	6.24	6.45	6.24	13.62	0.66	1.94	88.67	121.33	170.5	75.24	106.40	184.80
9	6.78	6.74	5.35	6.7	0.53	0.53	93.33	84	18.47	36.64	102.74	151.01
10	6.17	5.64	7.59	18.17	0.78	1.26	121.33	130.67	16.37	32.49	171.30	208.88
11	6.63	6.58	3.6	6.12	1.05	0.68	107.33	74.67	17.57	37.56	150.02	91.09
12	6.48	7.53	6.29	18.48	0.78	1.31	112	144.67	17.57	23.49	109.44	95.95
13	6.23	5.13	6.08	9.05	1.24	0.82	102.67	56	97.21	84.15	184.80	263.20
14	6.44	5.38	4.69	11.37	0.62	0.44	93.33	56	17.27	14.34	117.88	39.39
15	6.35	6.26	1.02	4.38	0.74	0.56	98	51.33	18.88	16.64	378.04	35.84
16	6.74	6.53	5.83	15.7	0.89	0.64	121.33	60.67	16.67	29.87	145.23	38.64
17	6.7	6.82	4.7	6.66	0.98	0.75	88.67	107.33	29.91	41.1	250.34	69.81
18	6.21	6.98	5.15	16.29	0.62	0.41	84	112	17.87	37.49	149.46	66.45
19	6.24	6.75	5.05	10.87	1.3	0.48	144.67	144.67	21.48	24.03	167.51	41.81
20	6.84	6.65	4.14	10.13	1	0.86	70	70	17.73	21.46	44.80	22.40
21	6.75	6.79	4.17	13.49	0.73	0.86	93.33	135.33	26.3	34.95	327.17	42.19

22	6.33	6.65	3.28	3.84	0.72	0.8	93.33	144.67	14.86	19.95	247.30	36.77
23	6.46	6.87	3.82	1.92	1.38	0.7	112	88.67	30.79	21.21	44.80	50.40
24	8.29	6.19	9.81	18.68	1.7	0.5	130.67	130.67	37.14	27.18	156.05	43.12
25	6.23	6.68	10.27	14.88	1.05	0.22	112	116.67	16.67	23.72	112.49	52.45
26	6.87	6.72	2.2	4.74	0.74	0.88	140	177.33	31.72	17.72	110.58	28.56
27	6.68	6.49	9.19	12.19	0.42	0.28	140	112	17.87	26.33	305.09	33.79
28	6.37	5.93	4.04	9.61	0.38	0.18	121.33	149.33	16.37	16.95	238.60	40.51
29	6.22	6.86	8.25	5.6	0.78	0.44	74.67	93.33	25.53	41.06	61.60	50.40
30	6.33	6.7	6.99	10.97	1.01	0.26	98	135.33	32.62	13.03	116.14	54.32
31	5.91	6.63	13.01	10.97	2.93	1.36	205.33	228.67	20.28	25.49	251.12	106.96
32	5.87	6.78	9.13	6.64	1.98	0.75	172.67	144.66	27.81	24.18	114.74	91.47
33	5.75	5.94	13.48	21.37	1.37	1.02	140	182	16.67	21.72	135.87	86.99
34	6.27	6.57	6.09	14.04	0.74	0.72	70	116.67	21.78	20.34	186.98	87.17
35	6.38	7.47	6.54	5.22	1.65	0.58	130.67	121.33	31.42	21.95	560.13	75.41
36	5.75	5.8	11.33	12.8	1.1	0.78	107.33	158.67	19.08	12.41	96.02	69.63
37	6.39	7.26	11.03	8.56	1.71	0.5	168	158.66	24.79	10.02	168.15	40.13
38	6.74	7.06	3.56	5.24	0.74	0.56	98	130.66	15.76	24.8	155.33	29.68
39	6.67	6.61	5.71	4.8	0.28	0.12	88.66	102.66	18.77	37.87	128.11	62.16
40	6.87	6.33	18.28	7.85	0.21	0.06	84	46.66	13.05	24.95	87.36	45.73
41	7.53	6.17	7.59	18.17	0.53	0.53	93.33	84	14.86	31.72	57.68	151.01
42	6.84	6.35	1.41	6.3	1.3	0.34	144.67	74.66	21.48	24.03	94.92	40.13
43	6.27	5.68	6.09	8.51	1.37	1.04	140.00	121.33	16.67	21.72	76.16	86.99
44	6.95	6.63	3.6	11.56	1.44	0.94	112.00	74.66	17.57	23.49	61.41	139.25
45	6.48	5.14	8.37	20.78	1.14	0.4	126.00	56	14.86	35.33	63.28	63.47
46	6.96	4.83	10.65	9.47	2.13	0.58	200.67	84	21.48	20.87	53.20	168.00
47	6.92	6.37	19.82	8.96	2.12	1.22	177.33	228.67	50.09	28.18	247.41	167.25

48	6.57	6.16	13.76	11.55	1.55	0.9	205.33	191.33	42.26	11.34	94.58	47.60
49	6.85	6.69	17.14	16.73	1.86	1.3	182	205.33	37.14	12.03	288.27	327.23
50	6.64	4.42	10.45	11.61	1.62	0.96	182	168	80.92	16.88	117.60	190.40
51	6.09	6.82	16.74	11.62	1.71	0.64	177.33	154	32.92	30.03	127.70	229.97
52	6.46	6.53	14.45	16.24	1.8	1.18	228.67	214.67	7.47	26.95	224.00	252.00
53	6.7	6.39	17.15	13.29	1.88	1.26	196	238	28.41	39.49	314.96	302.77
54	6.92	6.87	8.4	2.92	0.79	0.34	88.67	102.67	32.02	34.72	98.65	179.57
55	6.45	5.47	9.55	13.45	0.55	1.19	74.67	186.67	62.13	11.34	273.45	160.16
56	5.42	6.36	3.01	8.65	0.74	0.42	84	60.67	146.83	27.41	112.00	95.20
57	5.79	6.45	12.77	4.07	1.2	0.56	163.33	74.67	20.88	27.8	114.26	122.64
58	5.21	5.9	21.4	20.17	2.99	1.89	331.33	340.67	39.55	26.18	610.92	142.43
59	5.68	6.33	18.17	12.26	0.86	0.67	116.67	98	40.75	11.11	139.72	134.40
60	4.6	6.25	16.56	12.48	1.54	1.14	214.67	163.33	47.98	15.49	133.63	103.41
61	5.8	4.11	26.86	22.02	2.09	1.16	303.33	210	35.94	25.26	335.20	113.12
62	6.53	6.38	17.62	14.29	1.7	1.03	196	186.67	39.85	15.64	245.86	128.43
63	6.55	6.42	19.73	14.66	1.95	1.06	312.67	182	32.32	14.34	135.45	137.20
64	6.81	5.86	19.36	14.69	2.66	0.7	303.33	191.33	36.98	14.33	134.40	78.40
65	6.65	6.44	16.89	13.77	1.59	1.21	228.67	224	25.1	17.57	109.76	105.09
66	5.77	6.43	13.89	12.54	1.41	0.58	214.67	172.67	33.83	24.64	285.34	132.35
67	6.35	5.53	14.51	12.87	1.76	1.05	130.67	149.33	17.39	12.11	252.00	627.20
68	6.84	5.56	20.71	20.65	1.62	1.53	168	238	22.99	23.95	397.60	548.80
69	4.85	6.6	18.87	12.71	1.44	0.86	289.33	158.67	51.59	17.03	268.84	140.56
70	5.83	6.33	13.84	9.24	1.56	0.8	256.67	168	36.84	22.26	289.84	112.56
71	6.26	5.77	17.62	16.85	2	1.24	154	98	82.28	91.95	106.40	100.80
72	6.52	6.46	11.91	15.72	1.28	0.88	93.33	70	18.83	24.18	168.00	240.80
73	6.05	6.62	10.98	8.6	1.88	1.48	112	126	32.66	51.74	201.60	218.40

74	5.54	5.76	10.08	15.82	1.48	0.9	144.67	98	12.22	14.34	151.20	100.80
75	5.84	5.66	17.13	23.45	1.74	1.42	210	154	25.02	14.34	168.00	117.60
76	5.05	5.57	16.01	19.13	4.3	3.7	457.33	368.67	62.43	32.06	319.20	268.80
77	6.24	6.14	10.85	8.69	1.7	1.38	158.67	126	76.17	106.54	386.40	302.40
78	6.24	5.93	11.4	9.88	1.82	2.06	182	144.67	99.16	121.72	358.40	285.60
79	6.27	6.27	7.71	5.84	1.26	0.82	121.33	79.33	80.75	53.95	168.00	140.00
80	6.04	6.74	10.63	9.59	1.38	1.36	149.33	140	100.35	91.02	280.00	184.80
81	6.33	6.36	10.56	13.43	1.84	2.2	219.33	219.33	37.24	138.35	224.00	263.20
82	6.35	6.3	17.35	14.07	2.58	2	298.67	172.67	114	52.3	291.20	229.60
83	6.74	6.69	18.94	10.15	3.11	1.03	466.68	214.66	21.78	12.03	275.54	143.55
84	6.14	5.81	11.06	11.82	1.52	1.38	252	210	87.83	65.23	219.50	170.99
85	6.68	6.11	9.55	13.35	0.55	1.32	74.66	247.33	20.58	11.34	153.25	160.16
86	6.9	5.9	21.4	20.17	2.99	1.18	331.33	74.66	33.23	27.8	78.21	142.43
87	6.75	6.83	15.2	11.82	2.88	1.48	396.67	252	27.51	23.16	232.01	157.17
88	6.26	5.74	7.29	15.78	2.38	0.64	434	326.67	103.29	115.62	158.61	132.35
89	6.11	6.12	10.23	14.49	1.98	1.66	312.67	205.33	54.16	24.77	173.67	143.92
90	6.25	4.6	16.56	14.69	1.54	1.08	214.67	154	19.68	25.26	137.20	103.41
91	5.90	6.5	1.02	4.98	0.88	0.77	102.67	135.33	89.88	42.25	33.6	45.92
92	5.80	6.67	3.57	12.81	1.3	0.4	140	93.33	108.55	32.56	67.2	54.51
93	6.12	6.73	1.10	4.71	1.12	0.51	275.33	112	111.93	31.18	134.4	72.24
94	6.38	6.61	6.47	16.41	1.48	0.87	186.67	158.67	103.65	34.33	95.2	81.57
95	6.22	6.71	3.38	5.25	1.62	0.49	200.67	172.67	82.78	30.33	136.27	103.60
96	6.93	6.92	4.43	12.16	1.82	0.2	205.33	60.67	40.88	32.72	106.4	35.28
97	6.43	6.84	4.72	5.28	1.24	0.64	186.67	121.33	106.35	31.33	93.33	70.37
98	6.44	6.81	6.39	25.93	0.84	0.15	93.33	140	21.96	31.1	39.2	44.61
99	6.54	6.44	1.08	3.57	0.22	0.72	84	56.00	69.35	41.06	33.6	33.6

100	6.45	5.09	2.99	4.44	1.66	1.42	168	79.33	95.03	16.37	95.2	134.4
101	6.74	5.63	12.16	16.02	0.4	0.26	74.67	51.34	57.36	24.03	22.4	28
102	6.64	5.17	2.71	13.73	0.94	1.28	191.33	112.00	83.8	20.34	44.8	28
103	5.88	6.54	7.43	11.16	0.22	0.48	102.67	112	15.63	34.49	50.4	75.41
104	5.75	6.93	8.42	17.43	1.24	0.38	135.33	121.33	33.28	23.95	67.2	64.77
105	6.41	6.73	9.40	13.85	0.84	0.27	158.67	158.67	27.88	22.1	78.4	43.87
106	5.76	6.85	17.26	26.72	1.22	0.56	210	135.33	69.77	22.34	61.6	79.15
107	5.14	6.88	12.22	13.52	0.98	0.16	289.33	135.33	90.98	27.64	33.6	43.68
108	6.75	6.8	10.81	17.67	0.56	0.22	98	172.67	22.39	26.41	39.2	171.73
109	6.57	6.65	14.49	25.32	0.76	0.45	107.33	158.67	6.5	47.87	212.8	47.79
110	6.36	6.76	5.62	11.01	0.76	0.34	168	116.67	11.57	22.49	56	74.85
111	5.92	6.59	16.43	18.21	1.48	0.36	200.67	154.00	6.59	38.87	39.2	96.51
112	6.21	4.86	6.86	23.17	0.96	1.94	130.67	98.00	35.9	43.20	100.8	44.80
113	6.82	5.36	11.25	13.80	0.74	0.66	154	65.33	4.05	48.93	72.8	78.40
114	6.36	5.53	9.33	16.29	2.12	1.38	238	88.67	48.99	105.76	179.2	240.80
115	6.54	5.20	3.25	7.23	1.28	1.7	98	51.33	88.73	63.43	112	67.2
116	6.82	4.26	7.03	8.12	2.08	0.96	140	84	57.7	66.97	151.2	123.2
117	6.42	5.14	7.13	9.02	2.38	2.64	186.67	135.33	57.87	47.24	492.8	201.6
118	6.82	5.41	2.50	5.60	3.2	1.26	210	158.67	49.27	43.2	291.2	67.2
119	6.25	5.70	4.00	7.10	2.08	1.12	126	140	33.25	100.7	98.93	632.8
120	6.77	4.71	10.12	12.00	2.84	0.72	224	135.33	179.11	61.07	477.87	84
121	7.55	5.57	4.03	9.06	1	0.74	112	93.33	111.16	68.66	87.73	72.8
122	8.08	4.64	10.47	15.27	0.96	0.1	93.33	65.33	128.52	90.92	128.8	112
123	7.83	5.66	20.08	36.75	3.06	3.22	247.33	336	165.62	163.94	604.8	296.8
124	8.12	5.13	16.28	21.14	1.72	2.98	158.67	177.33	181.81	184.85	386.4	324.8

Range of soil parameters	4.11-8.29	1.02-36.75	0.06-4.3	46.66-466.68	4.05-184.85	22.40-632.80
Statistical significance (ANOVA)	($P < 0.05$, sig=0.000)	($P < 0.05$, sig=0.000)	($P < 0.05$, sig=0.000)	($P < 0.05$, sig=0.000)	($P < 0.05$, sig=0.000)	($P < 0.05$, sig=0.000)

*Soil fertility parameters: FWC- Field Water Content, TOC- Total Organic Carbon, SAN- Soil Available Nitrogen, SAP- Soil Available

Phosphorus, SAK- Soil Available Potassium

Supplementary Table 6 Pearson's correlation analysis of various soil fertility parameters

Soil fertility parameters	pH	FWC	TOC	SAN	SAP	SAK
pH						
FWC	-.174**					
TOC	-.113	.275**				
SAN	-.065	.387**	.692**			
SAP	-.045	-.010	.317**	.150*		
SAK	-.057	.167**	.493**	.331**	.299**	
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

- Soil fertility parameters: FWC- field water content, TOC- total organic carbon, SAN- soil available nitrogen, SAP- soil available phosphorus, SAK- soil available potassium

Supplementary Table 7 Pearson's correlation analysis of coconut palm varieties with various soil fertility parameters

Coconut palm varieties	Soil fertility parameters	pH	FWC	TOC	SAN	SAP	SAK
WCT	pH						
	FWC	-.176*					
	TOC	-.131	.377**				
	SAN	-.140	.546**	.697**			
	SAP	-.006	.039	.357**	.114		
	SAK	-.059	.236**	.506**	.363**	.314**	
COD	pH						
	FWC	-.194					
	TOC	-.158	.364*				
	SAN	.099	.325	.843**			
	SAP	-.530**	-.049	.201	.031		
	SAK	-.416*	.348	.620**	.507**	.287	
CGD	pH						
	FWC	-.378*					
	TOC	.141	-.090				
	SAN	.199	.026	.623**			
	SAP	-.020	-.086	.036	.523**		
	SAK	-.080	-.012	.432*	.652**	.243	
*. Correlation is significant at the 0.05 level (2-tailed).							
**. Correlation is significant at the 0.01 level (2-tailed).							

- Coconut varieties: WCT-west coast tall, COD-chowghat orange dwarf, CGD- chowghat green dwarf.
- Soil fertility parameters: FWC- field water content, TOC- total organic carbon, SAN- soil available nitrogen, SAP- soil available phosphorus, SAK- soil available potassium

Supplementary Table 8 Pearson's correlation analysis of coconut palm growing agroclimatic zones with various soil fertility parameters

Agroclimatic zones	Soil fertility parameters	pH	FWC	TOC	SAN	SAP	SAK
Lowland	pH						
	FWC	-.155*					
	TOC	-.155*	.313**				
	SAN	-.072	.380**	.718**			
	SAP	-.026	.035	.382**	.267**		
	SAK	-.056	.146	.529**	.347**	.423**	
Midland	pH						
	FWC	-.168					
	TOC	.023	.082				
	SAN	.021	.149	.660**			
	SAP	-.158	-.016	.097	-.086		
	SAK	-.034	.146	.367**	.248*	-.118	
*. Correlation is significant at the 0.05 level (2-tailed).							
**. Correlation is significant at the 0.01 level (2-tailed).							

- Soil fertility parameters: FWC- field water content, TOC- total organic carbon, SAN- soil available nitrogen, SAP- soil available phosphorus, SAK- soil available potassium

Supplementary Table 9 Pearson's correlation analysis of healthy and Root wilt diseased coconut palms with various soil fertility parameters

Palm health condition	Soil fertility parameters	pH	FWC	TOC	SAN	SAP	SAK
Healthy palms	pH						
	FWC	-.183					
	TOC	-.021	.380**				
	SAN	.004	.597**	.651**			
	SAP	.048	.082	.366**	.116		
	SAK	-.026	.306**	.535**	.432**	.303**	
Root wilt diseased palms	pH						
	FWC	-.114					
	TOC	-.305**	.230*				
	SAN	-.367**	.346**	.784**			
	SAP	-.077	-.075	.327**	.155		
	SAK	-.113	-.055	.451**	.296**	.292**	
*. Correlation is significant at the 0.05 level (2-tailed).							
**. Correlation is significant at the 0.01 level (2-tailed).							

- Soil fertility parameters: FWC- field water content, TOC- total organic carbon, SAN- soil available nitrogen, SAP- soil available phosphorus, SAK- soil available potassium