

Table A1 A comparison in soil properties change among locations at five depths

Location	Depth	Relative changes in physiochemical properties %					Relative changes in soil carbon and nutrients in concentration %						Relative changes in soil carbon and nutrients in storage %							
		BD	PR	SM	pH	EC	SOC	TN	AN	TK	AK	TP	AP	SOS	TNS	ANS	TKS	AKS	TPS	APS
Dumeng	(cm)																			
	0-20	-2.5 a	133 a	-240a	3.6a	-480b	12.1a	233a	520a	-24.1b	221.8a	1.7a	6.4a	9.9a	195a	455a	-258 b	212.2a	-1.5a	2.8a
	0-40	-5.1 a	6.8 a	-206a	2.9a	-264ab	7.6a	254a	408a	-3.3ab	735b	-155a	19.0a	1.8a	185 a	319a	-8.4ab	646b	-198 a	12.6a
	0-60	-6.5 a	168 a	-249a	1.8a	-156a	7.5a	14.1a	297a	3.4a	444b	-8.1a	105a	1.0a	7.4 a	203a	-3.7a	346b	-13.4 a	4.2a
	0-80	-5.7 a	17.1 a	-230a	1.8a	-8.4a	103a	160a	348a	6.5 a	365b	-11.4a	5.3a	2.9a	8.8 a	258a	0.1a	293b	-17.0 a	-0.9a
Fuyu	0-100	-5.9 a	16.1 a	-216a	1.7a	-6.3a	107a	212a	267a	0.5a	328b	-2.3a	-1.8a	3.1 a	132 a	179a	-6.0ab	250b	-8.6 a	-7.7a
	0-20	-7.3a	480a	145a	1.1a	7.0 a	-11.2a	155a	239a	2.4ab	1158a	280a	505a	-175 a	6.4 a	14.1a	-5.9 ab	989 a	162 a	389a
	0-40	-5.8a	233b	5.6b	0.6 ab	31.1 a	6.1a	134a	229a	-11.2b	441b	8.2a	-12.4ab	-0.3 a	6.2 a	165a	-16.7 b	363b	1.2 a	-173 ab
	0-60	-5.1a	158b	3.1b	-0.2 ab	335a	7.7a	130a	191a	-3.9ab	224b	6.2a	-279b	2.2 a	7.3 a	134 a	-9.2 ab	150b	1.1 a	-316 b
	0-80	-6.3a	109b	0.8b	-0.4 b	320 a	4.0 a	14.1a	171a	9.1a	231b	5.0a	-185ab	-3.0a	6.5 a	103 a	2.1a	155 b	-2.4 a	-232 ab
Lanling	0-100	-6.0a	8.6b	-0.8b	0.0 ab	229 a	1.4a	128a	183a	4.6ab	179b	5.5a	-297 b	-5.1 a	5.6 a	11.6 a	-1.9 ab	107 b	-1.4 a	-336 b
	0-20	4.5a	-1.3a	-260a	135a	-36.4b	12.4a	37.4a	102a	18.6a	712a	-7.9a	-6.1a	14.6a	41.3a	11.7 a	22.1a	74.6a	-7.9 a	-0.1a
	0-40	1.6a	0.6a	-199a	4.7b	-23.1ab	10.4a	11.3a	-1.4a	155a	315a	-15.1a	-11.9a	11.6a	130a	-1.3a	179a	310a	-160a	-5.6 a
	0-60	-0.1a	-2.2a	-14.7a	2.0b	-18.1ab	14.2a	4.3a	-4.9a	22.7a	34.4a	0.6 a	-9.4a	13.6 a	3.4a	-5.6 a	22.3a	35.4a	-0.8a	-8.8 a
	0-80	-0.4a	3.1a	-14.4a	1.8b	-13.3 a	6.9a	1.9a	-5.7a	19.4a	31.8a	-9.9a	-21.7 a	6.5a	1.8a	-6.1a	18.9a	29.9a	-10.6 a	-21.3 a
Mingshui	0-100	-1.3a	0.5a	-13.1a	0.9b	-9.0 a	7.1a	1.4a	-8.9a	10.8a	23.9 a	-1.3a	-22.3a	5.8a	0.4a	-10.1a	9.3 a	21.2 a	-2.8a	-22.9 a
	0-20	-10.2a	210a	660a	-1.0a	7.8a	-7.7a	-10.7a	27.6a	-42.8b	79.9a	0.8a	79.7a	-16.5 a	-10.7a	15.4a	-48.7 b	59.3a	-8.5a	61.8a
	0-40	-9.3a	185a	1.6b	0.9a	9.6a	-3.8a	-11.2a	10.7a	-26.0a	8.5b	2.4a	30.5b	-12.4a	-11.2a	0.9 a	-32.8 a	-1.3 b	-6.7 a	18.6b
	0-60	-7.9a	17.9a	-0.9b	0.6 a	20.2 a	-1.3a	-10.2a	9.2a	-18.5a	6.1b	-5.7a	-10.3c	-9.4a	-10.2 a	0.2 a	-24.9 a	-3.0b	-13.7 a	-17.4c
	0-80	-9.1a	15.1a	-1.1b	1.3 a	27.4a	-1.2a	-5.6 a	9.7a	-11.9a	17.8b	-5.1a	-11.9c	-10.2 a	-5.6 a	-0.2 a	-19.9 a	7.3 b	-13.6a	-20.0 c
Zhaodong	0-100	-8.9a	13.3a	-3.5b	1.8a	20.5a	-1.5a	-5.5 a	9.7a	-13.6a	31.3b	0.1a	-17.3c	-10.4a	-5.5 a	-0.1a	-21.2 a	19.7 b	-8.6a	-24.7 c
	0-20	-4.4a	5.9a	7.6a	4.9a	-54.0 b	15.3a	-11.2a	-2.0a	21.1a	179.7a	1.9a	-7.6b	9.6a	-16.2a	-6.9a	16.8a	168.7a	-1.5a	-12.5 b

	0-40	-2.5a	-3.7 a	-4.3ab	2.7b	-40.6ab	13.6a	6.3a	-7.2a	13.5a	62.8b	4.3a	-20.0b	10.7a	3.4a	-9.7a	10.8 a	59.4b	1.8a	-22.2 b
	0-60	-2.0a	-10.4a	-7.1b	1.8bc	-29.5 ab	10.4a	1.9a	-3.4a	20.7a	62.9b	7.6a	-16.3b	8.0 a	-0.3a	-5.8a	17.9a	58.5b	5.8a	-18.3 b
	0-80	-1.1a	-7.3a	-4.4ab	1.5c	-25.0a	6.7a	2.5a	-0.8a	22.6a	43.8b	5.8a	-6.4b	5.3a	1.1a	-2.3 a	21.1 a	42.1b	4.4a	-7.1 b
	0-100	-1.0 a	-6.6a	-3.6ab	1.3c	-19.2 a	5.6a	2.9a	-2.4 a	20.2a	36.5b	9.3a	35.1a	4.4a	1.6 a	-3.7 a	18.8a	35.0b	8.1a	34.6 a
Zhaozhou	0-20	0.5a	-4.9a	-0.7a	0.2a	35.1a	-5.9a	1.2a	-1.2a	38.9a	36.1a	-13.3a	47.0a	-5.4a	1.3a	-0.5 a	37.6a	36.0a	-13.8 a	46.6 a
	0-40	-3.8a	3.6a	-6.4a	0.2a	48.7 a	-3.0a	14.4a	-6.8a	16.8a	15.1a	-9.3a	31.3a	-7.2 a	9.8a	-10.2 a	12.4a	11.5 a	-12.8 a	26.3 a
	0-60	-11.2a	10.0a	-7.6a	-0.4 a	33.8 a	-5.0a	9.1a	-10.5a	19.5a	6.6a	-19.6 a	59.7a	-9.2a	4.2 a	-14.8a	14.5a	3.2 a	-23.1 a	53.7 a
	0-80	-2.6a	11.1a	-6.1a	-0.3 a	24.3a	30.1a	5.6a	-6.3a	30.0a	4.9a	-5.4a	51.7a	24.3 a	2.6 a	-8.8 a	26.5 a	2.5 a	-7.2 a	46.8 a
	0-100	-2.5a	8.4a	-4.4a	-0.2 a	16.4 a	-3.3a	4.1a	-3.9a	10.4a	5.1a	-7.5a	57.2a	-6.1 a	1.2 a	-6.3 a	7.5 a	2.4 a	-9.3 a	51.6 a

Table A2 Stepwise regression analysis between soil properties change and tree growth, soil texture and climate factors at different depths

Dependent variable	0-20cm	0-40cm	0-60cm	0-80cm	0-100cm
Soil physiochemical properties					
BD change	=-29.3+7.5* MAT, $r^2=0.15$		=-20.8+4.8* MAT, $r^2=0.15$	=-16.1+6.4* MAT-18.3*ARID, $r^2=0.32$	=-13.5+5.9* MAT-19.9*ARID, $r^2=0.34$
PR Change	=55.3+2.4*Clay-0.9*Silt-2.1*TH -0.4*TD, $r^2=0.29$	=-57.2-14.2* MAT, $r^2=0.11$	=66.5-17.0* MAT, $r^2=0.18$	=46.5-11.1* MAT, $r^2=0.10$	=44.7-11.0* MAT, $r^2=0.12$
SM change	=60.6+3.3* Clay-33.7*MAT, $r^2=0.18$	=14.1+1.8* Clay-102.6*ARID, $r^2=0.18$	=-30.1+1.0*Clay, $r^2=0.09$	=36.0-0.4*Sand-8.8*MAT, $r^2=0.11$	=-27.4+0.8*Clay, $r^2=0.08$
pH change	=-24.1+8.1* MAT, $r^2=0.23$	=-5.5+2.1*MAT, $r^2=0.06$			
EC change	=76.6-41.0* MAT+1.2*Silt, $r^2=0.15$	=91.1-26.4* MAT, $r^2=0.04$	=101.0-28.1* MAT, $r^2=0.10$	=99.2-35.7* MAT+0.7*Silt, $r^2=0.17$	=74.8-20.4* MAT, $r^2=0.09$
Soil carbon and nutrients in concentrations					
TN change		=193.4-0.4*MAP, $r^2=0.04$	=148.8-0.3*MAP, $r^2=0.04$		=33.4-0.6*Silt, $r^2=0.07$
AN change	=111.7-4.2*TH-20.8*TD, $r^2=0.15$	=65.7-1.3*Silt, $r^2=0.10$	=53.6-1.1*Silt, $r^2=0.08$	=149.9-0.3*MAP, $r^2=0.04$	=47.3-0.9*Silt, $r^2=0.08$
TK change	=-19.8+46.8* MAT-252.2*ARID, $r^2=0.15$	=-33.3+32.1*MAT-138.3*ARID, $r^2=0.27$	=-32.3+31.1*MAT-122.1*ARID, $r^2=0.38$	=7.6+24.8*MAT-144.9*ARID, $r^2=0.29$	=-6.8+19.2*MAT-97.5*ARID, $r^2=0.22$
AK change	=-893.3-7.7*Silt+2.9*MAP, $r^2=0.20$	=96.3-1.3*Silt, $r^2=0.08$			=-586.9-727.5*ARID+2.2*MAP +1.0*DBH-2.3*Clay, $r^2=0.39$
TP change	=41.9-2.7*TH, $r^2=0.07$				
AP change	=184.5-45.3* MAT, $r^2=0.07$		=120.5-361.9*ARID+1.2*DBH +1.2*Silt, $r^2=0.15$	=129.5-233.8*ARID, $r^2=0.12$	

Soil carbon and nutrients in storage					
SOS change	=-64.5+18.4* MAT, r ² =0.08		=-42.5+12.5* MAT, r ² =0.04		
TNS change			=24.4-0.5*Silt, r ² =0.06		
AN S change	=-18.7+0.8*Sand, r ² =0.07		=55.3-1.2*Silt, r ² =0.10	=40.2-0.9*Silt, r ² =0.06	=48.4-1.0*Silt, r ² =0.10
T KS change	=-50.3+53.9* MAT-245.6*ARID, r ² =0.19		=-57.9+37.4*MAT-133.0*ARID, r ² =0.32	=-52.7+34.8*MAT-116.5*ARID, r ² =0.46	=-11.5+30.4*MAT-154.0*ARID, r ² =0.39
AKS change	=263.5-3.6*Silt, r ² =0.16		=-1.11+0.9*Sand, r ² =0.07	=-51.4+33.7*MAT-2.8*TH, r ² =0.11	=-21.8+24.3*MAT-109.9*ARID, r ² =0.33
APS change	=6.3+3.0*DBH-5.0*TH, r ² =0.15			=45.0-2.2*Clay, r ² =0.06	=118.9-221.9*ARID, r ² =0.11
Data statistics					
Climatic entering times	11	10	10	12	12
Soil texture entering times	7	5	5	3	7
Forest parameter entering	7	0	2	0	2

Note: The abbreviation in Table A1 and A2: BD: Bulk density; PC :Porosity; SM: Soil moisture; TN: Total N; AN: Alkaline hydrolyzed N; TK: Total K; AK: Available K; AP: Available P; SOS:Soil organic carbon storage; TNS: Total N storage; ANS: Alkaline hydrolyzed N storage; TKS: Total K storage; AKS: Available K storage; TPS: Total P storage; APS: Available P storage.