Determining an Accurate and Cost-Effective Individual Height-Diameter Model for Mongolian Pine on Sandy Land

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Table S1 Akaike information criterion (AIC) and the Bayesian information criterion (BIC) of different variance function in fitting heteroscedasticity for mixed-effects models. Bold indicates the lowest AIC and BIC.

Random parameters	Basic		Generalized	
	AIC	BIC	AIC	BIC
Exponential	2754.74	2779.62	2609.42	2639.27
Power	**2745.71**	**2770.59**	**2600.12**	**2629.97**
Constant plus power	2747.71	2777.56	2602.12	2636.95

Table S2. Mean absolute error (MAE) and root mean squared error (RMSE) for different calibration designs of mixed-effects H-D models. The mean of words in tree size column are: FP for fixed-effects prediction, N for the thinnest tree, M for medium diameter tree, K for the thickest tree. The different letters in the tree size column indicate combinations of tree size. For example, the N1M1 means one thinnest and one medium diameter trees (in order), and N1M1K1 indicates one thinnest, one medium and one thickest diameter tree (in order). Asterisk in column of MAE indicates significant difference between predicted and observed height ($p < 0.05$).

Tree size	Number of trees	MAE		RMSE	
		Basic	Generalized	Basic	Generalized
	0	1.9103 *	0.6403	2.2613	0.8477
N1	1	0.8983	0.6402	1.1805	0.8466
M1	1	0.7652 *	0.635	1.0333	0.8431
K1	1	0.7892 *	0.6423	1.0167	0.8493
N2	2	0.7712	0.633	1.001	0.8405
M2	2	0.742 *	0.6329	0.9979	0.8417
K2	2	0.6982	0.6419	0.9236	0.8494
N1M1	2	0.7607 *	0.6359	0.9775	0.8426
M1K1	2	0.6783 *	0.637	0.9088	0.8446
N1K1	2	0.7619	0.6422	0.9874	0.8482
N3	3	0.7105 *	0.6329	0.9396	0.8406
M3	3	0.6840	0.6303	0.8957	0.8355
K3	3	0.6841	0.6415	0.9017	0.8487
N1M2	3	0.7364 *	0.6344	0.9535	0.8416
M1K2	3	0.6531 *	0.6372	0.8746	0.8448
N1K2	3	0.7053	0.6417	0.923	0.8483
N2M1	3	0.7328 *	0.6301	0.9465	0.838
M2K1	3	0.6786 *	0.6349	0.9116	0.8427
N2K1	3	0.7135	0.6354	0.9309	0.8422
N1M1K1	3	0.6991 *	0.6377	0.9072	0.8439
N4	4	0.6796	0.6267	0.9011	0.8349

Tree size	Number of trees	MAE		RMSE	
		Basic	Generalized	Basic	Generalized
M4	4	0.6492	0.6278	0.8576	0.8321
K4	4	0.6648	0.6408	0.8875	0.8486
N1M3	4	0.6974	0.6316	0.8951	0.836
M1K3	4	0.6577 *	0.6371	0.8787	0.8447
N1K3	4	0.6962	0.6414	0.9105	0.8481
N2M2	4	0.7087 *	0.6288	0.9243	0.8373
M2K2	4	0.6501 *	0.6348	0.8748	0.8426
N2K2	4	0.6866	0.636	0.9032	0.843
N3M1	4	0.6973 *	0.6302	0.914	0.8382
M3K1	4	0.6636	0.633	0.8761	0.8374
N3K1	4	0.6767 *	0.6346	0.8992	0.8418
N5	5	0.6563	0.6249	0.8755	0.8326
M5	5	0.6488 *	0.626	0.8559	0.8283
K5	5	0.6464	0.6391	0.8522	0.8437
N2M3	5	0.6906	0.6277	0.8958	0.8332
M2K3	5	0.6479 *	0.6343	0.8704	0.8425
N2K3	5	0.6852	0.6365	0.9013	0.8437
N3M2	5	0.6930 *	0.6297 *	0.9126	0.8384
M3K2	5	0.6516	0.6334	0.862	0.8379
N3K2	5	0.6609 *	0.6348	0.8803	0.8423
N6	6	0.6521	0.6262	0.8687	0.8338
M6	6	0.6464 *	0.6251	0.8446	0.8259
K6	6	0.6522	0.6385	0.8538	0.841
N3M3	6	0.6660 *	0.6267	0.8735	0.8327
M3K3	6	0.6519	0.6335	0.8626	0.8385
N3K3	6	0.6597 *	0.6351	0.8784	0.8425
N2M2K2	6	0.6601 *	0.6309	0.8724	0.8387