Siipilehto J., Rajala M. (2019). Model for diameter distribution from assortments volumes: theoretical formulation and a case application with a sample of timber trade data for clear-cut sections. Silva Fennica vol. 53 no. 1 article id 10062. https://doi.org/10.14214/sf.10062

Supplementary file S1

Näslund's (1936) height curve as a function of the tree's *dbh* and the predicted height curve parameters b_0 and b_1 is $h=(dbh\ /(b_0+b_1\ dbh))^p$ +1.3. The power p was 2 for Scots pine and birch (and other broadleaved species) and 3 for Norway spruce. The parameters b_0 and b_1 were predicted from the assortment volumes using models by Siipilehto and Kangas (2015). The prediction models for parameters b_0 and b_1 were fitted as linear mixed effects model in R using the lme function.

Table 1. Height models predicted from assortments volume. The commercial volume (*Vcom*) is the sum of the saw log (*Log*) and pulpwood (*Pulp*) volume. *DDY* is the long-time average degree days using a 5 °C threshold temperature. The random components s(b_{0i}) and s(b_{1i}) are the stand-specific (i) constant and coefficient, respectively. The term s(e_{ij}) is a scale parameter for the variance function, and the final standard deviation can be calculated as $s_{yi} = s(e_{ij})(1000/DDY)^{p}$. For pine, this number is $0.257(1000/DDY)^{0.914}$.

Parameter	Pine		Spruce		Birch	
b_0	Estim.	Std.	Estim.	Std.	Estim.	Std.
Intercept	3.128	0.065	3.011	0.144	1.400	0.161
(*DDY*/1000)	-0.537	0.058	-0.963	0.103	-0.666	0.158
ln(*Log* +2)	-0.041	0.005	0.161	0.013		
ln(*Pulp* +2)	-0.414	0.010	-0.212	0.026	-0.346	0.101
ln(*Vcom* +2)					0.409	0.097
b_1						
Intercept	0.232	0.003	0.387	0. 009	0.343	0.010
ln(*Log*+2)	-0.025	0.0005	-0.021	0.001		
ln(*Pulp*+2)	0.023	0.001	0.006	0.002	0.023	0.006
ln(*Vcom* +2)					-0.054	0.006
s(b_{0i})	0.245		0.295		0.209	
s(b_{1i})	0.022		0.022		0.025	
Corr(b_0, b_1)	-0.621		-0.790		-0.673	
s(e_{ij})	0.257		0.261		0.209	
Variance function						
(1000/*DDY*)	0.914		0.800		0.790	