Supplementary material

Tab. S1 – List of variables used to study silver birch mortality.

Variables	Description	Calculation	Type	Level	Range	Mean ± SD
N_{ha}	The number of trees per hectare	n/S	Non-spatial	Stand	244- 8256	2316 ± 1247
G	Stand basal area, m^2ha^{-1}	$\sum_{i=1}^{n}\left(g_i\right)/S$	Non-spatial	Stand	4.09-52.22	23.49 ± 7.01
SI_{100}	Site index, m		Non-spatial	Stand	32.36-43.84	37.39 ± 1.87
age	Age of overstorey, year		Non-spatial	Stand	19-180	40.46 ± 17.63
dbh	Diameter at breast height, cm		Non-spatial	Tree	1.5-51.5	17.94 ± 6.82
d_{rel}	Relative tree diameter	dbh_i/ D	Non-spatial	Tree	0.16-2.69	0.95 ± 0.38
id_5	Five-year diameter growth, cm	dbh_t-dbh_{t-1}	Non-spatial	Tree	-1.00- 6.50	1.23 ± 0.91
g	Tree basal area, m^2	$(\pi/4).\left(dbh_i^2/10000\right)$	Non-spatial	Tree	0.0002- 0.21	0.02 ± 0.01
BAL	Basal area of larger trees, m^2ha^{-1}	$\sum_{dbh_i<dbh_j}^{n}\left(g_j\right)/S$	Non-spatial	Tree	0-44.03	17.08 ± 8.09
$d_{rel.cz}$	Relative tree diameter	dbh/ D_{cz}	Spatial	Stand	0.21-3.02	0.98 ± 0.37
BAL_{cz}	Basal area of larger trees inside the influence zone, m^2h^{-1}	$\sum_{dbh_i<dbh_j}^{n_{cz}}\left(g_j\right)/S_{cz}$	Spatial	Stand	0-53.45	16.48 ± 9.54
CI	Hegyi competition index for competitors within the influence zone	$\sum_{j\neq i}^{n_{cz}}\left(dbh_j/\left(dbh_i \cdot L_{ij}\right)\right)$	Spatial	Tree	0-51.4	9.59 ± 6.44
agg	Aggregation index for trees within the influence zone	$\frac{L_{nn}}{L_{cz}}; L_{cz}=\frac{1}{2.\sqrt{n_{cz}/S_{cz}}}$	Spatial	Tree	0.35-1.98	1.35 ± 0.20
sp	Species proportion for n nearest neighbours	$\frac{1}{n_{nei}}\sum_{j=1}^{n_{nei}} m$ (m=1 if the tree is the species of interest, otherwise m=0)	Spatial	Tree	0.0-1.0	0.37 ± 0.29
ST	Self-thinning situation	$\frac{L_{\lim}}{L}$	Spatial	Tree	0.0-1.0	0.17 ± 0.38
I_{thin}	Thinning intensity	Number of thinned trees / total number of trees (in plot)	Non-spatial	Stand	0-0.80	0.27 ± 0.11
CI_{red}	CI for removed competitors in influence zone	$\sum_{j\neq i}^{n_{rem}}\left(dbh_j/\left(dbh_i \cdot L_{ij}\right)\right)$	Spatial	Tree	0-20.12	1.45 ± 0.90

Notes: dbh_i and dbh_j are the diameter at breast height of reference tree and neighbouring tree, respectively (cm); dbh_{t-1} and dbh_t are the diameter at breast height of trees in first and second measurements, respectively; g_i and g_j are the basal area of reference tree and neighbouring tree, respectively (m^2ha^{-1}); D and D_{cz} are the plot quadratic mean diameter and quadratic mean diameter of trees within the influence zone (cm), respectively; L_{ij}, L_{nn} and L_{cz} are the distance between the reference tree and neighbouring tree, arithmetic mean of distances between trees and the nearest neighbour, and the mean nearest neighbour distance within the influence zone (m), respectively; L and L_{lim} are, stand sparsity and limiting sparsity (m), respectively. N, is the number of trees within a plot; n_{cz}, n_{nei} and n_{rem} are the number of trees, neighbouring trees and harvested trees inside the influence zone, respectively. S and S_{cz} are the plot area (ha) and influence zone, respectively.