

Supplementary data

Table S1. Association of impacts of diseases and topographical, climatic, stand and disease variables. Bold values indicate a significant association at $p < 0.05$. ‘Coef’ columns show the coefficient estimate value of the association. ‘ p ’ columns show the p value of the association.

| | Canopy defoliation | | <i>P. nigra</i> mortality | | <i>Quercus</i> spp. density | | Shrub cover | |
|-------------------------------------|--------------------|---------------|---------------------------|---------------|-----------------------------|---------------|-------------|---------------|
| | Coef | p | Coef | p | Coef | p | Coef | p |
| Topographical variables | | | | | | | | |
| Altitude | -0.001 | 0.0002 | -0.005 | 0.0129 | -0.001 | 0.2586 | -0.003 | 0.0009 |
| Orientation (South) | -0.001 | 0.5011 | -0.029 | 0.0001 | 0.003 | 0.2692 | -0.005 | 0.1458 |
| River proximity | 0.374 | 0.1262 | 0.589 | 0.6674 | -0.444 | 0.4475 | 0.996 | 0.0988 |
| Climatic variables | | | | | | | | |
| Mean temperature | | | | | | | | |
| Annual | 0.043 | 0.4051 | 0.517 | 0.0755 | 0.090 | 0.4550 | -0.005 | 0.9659 |
| Autumn | 0.041 | 0.4217 | 0.479 | 0.0922 | 0.097 | 0.4176 | -0.007 | 0.9552 |
| Winter | 0.032 | 0.5974 | 0.394 | 0.2347 | 0.165 | 0.2548 | -0.028 | 0.8499 |
| Spring | 0.044 | 0.3637 | 0.554 | 0.0487 | 0.066 | 0.5579 | 0.001 | 0.9914 |
| Summer | 0.045 | 0.3250 | 0.573 | 0.0334 | 0.057 | 0.5966 | 0.003 | 0.9774 |
| Precipitation | | | | | | | | |
| Annual | -0.001 | 0.1989 | -0.011 | 0.0113 | -0.001 | 0.7445 | 0.000 | 0.9825 |
| Autumn | -0.011 | 0.1645 | -0.155 | 0.0029 | 0.001 | 0.9723 | -0.002 | 0.9242 |
| Winter | -0.009 | 0.2735 | -0.131 | 0.0170 | -0.011 | 0.5857 | 0.004 | 0.8605 |
| Spring | -0.009 | 0.2513 | -0.097 | 0.0322 | -0.011 | 0.5754 | 0.001 | 0.9501 |
| Summer | -0.011 | 0.1500 | -0.114 | 0.0107 | -0.004 | 0.8231 | -0.004 | 0.8284 |
| Stand variables | | | | | | | | |
| Tree density | 0.000 | 0.4427 | 0.032 | 0.2686 | 0.000 | 0.3003 | -0.010 | 0.3858 |
| Structure (Even-aged) | -0.026 | 0.8417 | -0.235 | 0.7392 | -0.076 | 0.8031 | -0.217 | 0.4902 |
| Basal area | -0.001 | 0.8859 | 0.023 | 0.3687 | 0.014 | 0.2716 | -0.017 | 0.2156 |
| DBH | -0.045 | 0.0002 | -0.137 | 0.0368 | -0.057 | 0.0544 | -0.023 | 0.4686 |
| Disease variables | | | | | | | | |
| Canopy needle blight severity | 2.323 | 0.0000 | 4.318 | 0.1686 | -3.114 | 0.0124 | 2.739 | 0.0310 |
| Canopy shoot blight severity | 2.508 | 0.1341 | 11.296 | 0.2935 | 8.032 | 0.0466 | 5.404 | 0.1951 |
| Regeneration needle blight severity | 2.341 | 0.0010 | -1.072 | 0.7719 | -4.042 | 0.0392 | 2.821 | 0.1561 |
| Regeneration shoot blight severity | 0.423 | 0.5696 | 6.342 | 0.0063 | -1.116 | 0.5287 | 1.066 | 0.5501 |

Figure S1. Severe growth reduction observed in a defoliated *P. nigra* tree. The two points indicate the rings formed in 2000 and 2010. The last ring was formed in 2021.

