The importance of the nursery pathway for the spread of *Phytophthora* species to natural ecosystems in Europe.

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An analysis of incidence of *Phytophthora* spp. in 732 European nurseries producing forest transplants, larger specimen trees, landscape plants and ornamentals, plus 2525 areas in which trees and shrubs were planted, is presented based on work conducted by 38 research groups in 23 European countries between 1972 and 2013. Forty-nine *Phytophthora* taxa were recorded in 670 nurseries (91.5%); within these nurseries, 1614 of 1992 nursery stands (81.0%) were infested, although most affected plants appeared healthy. In forest and landscape plantings, 56 *Phytophthora* taxa were recovered from 1667 of 2525 tested sites (66.0%). Affected plants frequently showed symptoms such as crown thinning, chlorosis and dieback caused by extensive fine root losses and/or collar rot. Many well-known highly damaging host–Phytophthora combinations were frequently detected but 297 and 407 new *Phytophthora*–host associations were also observed in nurseries and plantings, respectively. On average, 1.3 *Phytophthora* species/taxa per infested nursery stand and planting site were isolated. At least 47 of the 68 *Phytophthora* species/taxa detected in nurseries and plantings were exotic species several of which are
considered well established in both nurseries and plantings in Europe. Seven known *Phytophthora* species/taxa were found for the first time in Europe, while 10 taxa had not been previously recorded from nurseries or plantings; in addition, 5 taxa were first detections on woody plant species. Seven *Phytophthora* taxa were previously unknown to science. The reasons for these failures of plant biosecurity in Europe, implications for forest and semi-natural ecosystems and possible ways to improve biosecurity are discussed.