Forest Phytophthoras – a hidden threat to take a serious note of

By Jan Nagel

Phytophthora is an important group of fungi-like microorganisms that are well-known plant pathogens and the cause of some of the most destructive plant diseases in the world.

Of concern is that there is an increasing number of *Phytophthora* species that are being associated with forest tree disease around the world. Tree diseases caused by *Phytophthora* species are typically thought to be caused by soil and water borne species causing root and collar rots. More recently, however, several *Phytophthora* species have been shown to be associated with foliar and trunk infection, and are aerially spread.

These aerial *Phytophthoras* include some destructive pathogens, such as *P. ramorum* which causes sudden oak death of several oak species within the indigenous forests of California. Perhaps most alarming, however, is *P. pinifolia* that cause "Daño Foliar del Pino", a serious foliar disease of Monterey Pine, occurring in commercial forests of Chile.

Devastation caused by Phytopthora pinifolia on pinus radiata in Chile

Eighteen *Phytophthora* species have been found from South Africa, mostly associated with diseases of crops such as citrus, grapevine and avocado. The effects of *Phytophthora* is, however, also seen in indigenous ecosystems, especially within the Fynbos biome where several *Phytophthora* species cause disease and mortality of species of Proteas, the Silvertree and Buchu.

Amongst the South Africa forestry tree species, Black Wattle (*Acacia mearnsii*) is seriously affected by black butt disease. Initially, *P. nicotianae* was shown to be the cause of this disease, but later two additional species, *P. boehmeriae* and *P. meadii*, was also found to cause this disease. The widely distributed species, *P. cinnamomi*, causes root and collar rot of both pines and eucalypts in plantations. In forestry nurseries it also causes damping off of pine and eucalypt seedlings, sometimes resulting in nursery quarantine and the destruction of countless seedlings. *Phytophthora boehmeriae* and *P. nicotianae* also cause disease on several *Eucalyptus* species, and especially *P. nicotianae* can be particular is commonly in some situations. Most recently, two unknown species, which were subsequently named *P. alticola* and *P. frigida* were found to cause root and collar rot of cold tolerant Eucalypts.

One of the dangers facing forestry in South Africa is the lack of knowledge regarding the diversity of *Phytophthora* species in the country, especially in native situations. As seen in other countries, pilot studies here are showing that these environments harbour numerous unknown species that potentially threaten the industry The TPCP and CTHB programmes are, therefore, continuing to build a foundation of knowledge and capacity to deal with these important forest pathogens. MN