The pathogen has been found in Norfolk Island Pine (*Araucaria heterophylla*) and Hoop Pine, (*Araucaria cunninghamii*). At least 8 trees to date have been identified with what appears to be the same pathogen (ie same symptoms) these have been located at; Berri, Werri Beach, Jamberoo, Mangerton, Wollongong, and Russell Vale. The ages of the trees have ranged from 25 years to 140 years. In no situation were any of the trees stressed, nor had they had any changes around the root zones suggesting a stressed example. The soil types the trees reside within ranged from loamy sand (adjacent to the Werri beach) to a clay (Berry).

The infection always starts at the top of the tree, and extends down the stem to the ground rapidly, killing the tree. Within each assessment from the time of infection to tree death has been a maximum of 2 years, and a period of up to 18 months has been typical. By the time the infection is half way down the stem, the top of the crown has defoliated, any remaining leaves are dead, and the leaves around the area of active infection (disease front) is chlorotic (generally a single rosette of branches). The infection does not affect the bark, and this appears visually normal, however instead of being solid and firm, the infected area is spongy. Pealing the bark aside presents a decayed vascular system like ‘soggy black soot’ (Photo 4). The heart wood is unaffected, and offers the typical pale colour of the timber.

Considering birds (especially cockatoos) commonly used the tops of these trees as perches, they may be the primary means of transmission.

The transmission of this disease has also been noted via a branch graft (Photo 2,3), and possible wounding from branches clashing (Photo 1). Therefore avenues of trees may be susceptible.

Only one tree to date (amongst those assessed) has had an attempt at treatment. Complete tree removal was recommended however the client insisted on an attempt at salvaging the tree. Over two thirds of this tree was infected, the top section of the tree was removed 1m below the disease front. Two years later, the tree has grown new leaders and no further infection appears to exist (Photos 6, 7).

Further information of this disease (tree species and location) would be greatly appreciated.

Regards

Warwick Varley
Photo 1, Location Russel Vale, Tree age, 25 years. The red arrows indicate the disease front. Branches of the most infected tree (C) have clashed with those on the other tree, and the ends of these branches (D) are displaying symptoms of chlorosis and dieback below the disease front. Assuming possible wounding via the branches clashing and transmission of the pathogen.
Photo 2, Location Jamberoo, Tree age, approx. 80 years (*Araucaria cunninghamii*). Tree B was assessed 12 months earlier and had dieback of the top third of the crown only, the remaining crown was normal. The only remaining branches (lower crown) are now chlorotic. One of these branches has grafted with a branch from tree A (same species). The grafted branch (red circle) of tree A, now has chlorotic foliage just on that branch alone, suggesting transmission of the pathogen. see photo 3.

Photo 3, red circle indicates branch graft, the foliage labelled A and B, indicate the relative tree the branch/foliage belongs to.
Photo 4, bark peeled back indicating the infected tissue.

Photo 5, section of the vascular tissue removed from the disease front indicating the path of transition. Sample from area marked by red arrow on tree D, photo 1.
Photo 6, location: Werri Beach, age 60 years, red arrow indicates disease front

Photo 7, Two years after removal of pathogen, no further infection appears to exist.