

## Whispering Pines

### Whispering Pines: Do They Walk & Talk?

Ben Kruser      *The Leader, November 1989*

Coniferous or "evergreen" trees, ranging in diversity from thousand year old Bristle cone pines to giant redwoods that top 75 m, have been a source of wonderment for centuries. Early people revered them as a sign of rebirth and renewal during bleak winter months. Their ability to survive the harshest climates is a story of harmonious adaptations within a single organism and between the organism and its environment.

Conifers are generally found where soil quality is poor and water is sparse to occasionally non-existent. They are able to cope through several unique systems.

Evergreens can absorb cold water even when soil temperatures dip below freezing. Many conifer species can continue to photosynthesize in sub-zero weather. This means that evergreens are building up a reserve of food throughout the winter and are not dependent on summer as the primary growing time.

This is especially important for conifers that make up the upper tree lines of mountains. The only things that seem to limit their growth are sheer rock and very strong wind. You will find them growing even in nutrient deficient pebbles and sand.

Conifers are able to prosper by tapping or conserving food reserves not found in hardwoods. Evergreens lose only about 15% of their leaves each year compared to a 100% annual loss in hardwoods, and some leaves live as long as 30 years. This reduces the energy demand created by spring foliage production. And conifers can extract up to two thirds of their nutrient needs from older leaves during the onset of the growing season.

Their needles also play other key roles in evergreen survival. In dry climates, fog condenses on them and drains to the ground below, significantly adding to the tree's water sources during drought conditions. Meanwhile, their waxy leaf coatings also help retain internal moisture.

Densely packed evergreen needles act as an air filter, as well. Much as they catch the fog, they also catch wind borne minerals. These nutrients then fall to the ground to enhance the generally poor quality soil. The packed needles on conifer saplings protect the terminal bud (growing end) from damage during small ground fires, too.

Like other trees, evergreens run the risk of invasion and damage by insects and fungi. In both wood and leaves, conifers produce the chemical tannin, an astringent substance that reduces the palatability of leaves and makes the wood resistant to fungal infections. Young conifer needles have higher concentrations of tannin, a way to limit the amount of damage insects do to new growth.

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One of the more amazing things about conifers is their ability to "talk" to one another during an insect invasion. Scientists have found that damaged trees emit certain chemicals that stimulate nearby uninfected trees to increase their production of defensive chemicals such as tannin. This enables them, over time, to reduce their attractiveness to food-seeking insects and slow down infestations.

Conifers mixed in with hardwoods are also beneficial during insect outbreaks. Since evergreen needles are generally less palatable than hardwood leaves, any insects that land on a conifer expend their energies looking for food. Again, the result is to reduce pest populations.

There are other marvellous things we've learned about conifers. For example, recent studies show that pine cones use the laws of aerodynamics to collect pollen. We used to think pollination was rather a haphazard event that happened when pollen showered cones. Wind tunnel experiments now show that a cone's wing-shaped scales actually bend wind direction to make the wind rotate around the cone. The corkscrew current picks up pollen and drives it into receptive ovules.

Finally, the evergreen's familiar triangular profile gives it not only good looks but also many other advantages. The pyramid shape helps the trees absorb sunlight at low sun angles and under cloudy skies. The narrow shape and downward pointing branches enables them to shed snow quickly so that they can more easily continue to photosynthesize throughout winter.

So you see, whispering pines do have many things to talk about. And, no, they don't walk around, but the reason isn't so much because they are anchored to the ground by roots. They simply don't produce enough energy to support ambulatory movement.

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