**Spiral Fibers**
**Strengthen Tree Trunk**

**LIVING SYSTEM:**
Pines

**AUTHOR:**
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**FUNCTIONS PERFORMED:**
Protect from Wind  Manage Shear

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**Trunk of pine tree withstands wind and snow via spiral growth.**

Some trees, including the Ponderosa pine, Scots pine, and Norway spruce, exhibit a spiral growth pattern in their trunks, branches, and stems. Some scientists suggest that because spiral-grained materials bend more than straight-grained materials, this spiral composition may help protect trees that grow in areas of high wind from breaking. A tree’s ability to bend and twist in strong winds may reduce drag forces on its limbs and also allow additional weight (such as that from snow) to slide off its branches when they twist in the wind.

When tested for the ability to bend before breaking, spiral-grained sticks break under the same force as straight-grained sticks, but spiral-grained samples performed differently than straight ones before breaking. Spiral-grained materials deflect (or bend) more than straight-grained materials. During
deflection of straight-grained materials, the side nearest the force is compressed while the opposite side is stretched, putting it under tension. In contrast, spiral-grained materials transfer the compression and tension forces along the spiral to the other side, thereby equalizing the stresses.

Visit this Strategy on AskNature: https://asknature.org/spiral-tree-trunks

References:

JOURNAL ARTICLE

BOOK