Do Trees Sleep and Hibernate?

by Marilyn Loser

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Before I get into today's topic, I would appreciate your consideration of the following: One issue on the Alamosa ballots mailed out last week is whether non-residents should be able to serve on advisory boards. I voted a resounding YES. According to the City of Alamosa website, "A "Yes" vote would allow non-city residents to serve on an advisory board if that person works full-time, owns property, or owns a business within city limits." I have served on the Alamosa Tree Board for more than eight years. At times it has been difficult to recruit board members since they had to be residents. Over the years I've talked with a number of folks I would have loved to have on the Tree Board as they are deeply vested in our city – unfortunately, they did not meet the stringent resident requirement. Other boards have had the same problem recruiting viable members. Please consider voting YES on this issue.

We're entering into the darker and colder time of the year in Alamosa. I know I've started pulling out warmer clothing and want to linger longer in bed in the morning greyness. It makes me wonder what my trees are doing to prepare for winter. How do they stay alive in our bitter cold night temperatures?

It's obvious that deciduous trees are dropping their leaves. But what else is going on? We know some animals hibernate. Trees go through a process similar to hibernation called dormancy, and that is what keeps them alive during the winter. "Trees enter the dormant or 'resting' season based on the decrease in temperature and the decrease of daylight received," says Rex Bastian on the Davey Tree website.

"Dormancy is like hibernation in that everything within the plant slows down -- metabolism, energy consumption, growth and so on," reports Eileen Campbell in a Mother Nature Network (mnn.com) article. The first part of dormancy is when trees lose their leaves. Campbell says, "They don't make food in the winter, so they have no use for masses of leaves that would require energy to maintain. When it's time for trees to lose their leaves, a chemical called ABA (Abscisic acid) is produced in terminal buds (the part at the tip of the stem that connects to the leaf)." The terminal bud is where the leaf breaks off when it falls, so when ABA gathers there; it signals leaves of deciduous trees to break off.

ABA is a chemical that also suspends growth, preventing cells from dividing. This is something that occurs in both deciduous and evergreen trees. Impeded growth is another aspect of dormancy. It saves a lot of energy to stall growth during the winter, and during the winter, the tree isn't making any new food for energy. It's similar to hibernation, since most animals who hibernate store food as fat, and then use it to run their essential systems during the winter, rather than grow any more. The tree's metabolism also slows down during dormancy, and this is part of why cell growth is impeded. Since it has to conserve the food it has stored, it is best if the tree uses it up slowly and only for essential functions.

While I think of land animals as needing sleep, I never thought about whether trees, in the summer months, especially, need sleep. Turns out researchers at the Vienna University of Technology discovered trees go to sleep, too. Using laser scanners, scientists are studying the day-night rhythm of trees reports a May 17, 2016 article at the Science Daily website.

Past research by scientists like Linnaeus and Darwin only studied small plants grown in pots. The new research involved measuring the sleep movement of fully grown trees. "Our results show that the whole tree droops during night which can be seen as position change in leaves and branches," says the article, "The changes are not too large, only up to 10 cm [about 4 in] for trees with a height of about 5 meters [16 ft], but they were systematic and well within the accuracy of our instruments."

The tests were done close to solar equinox, under calm conditions with no wind or condensation. The leaves and branches were shown to droop gradually, with the lowest position reached a couple of hours before sunrise. In the morning, the trees returned to their original position within a few hours. It is not yet clear whether they were "woken up" by the sun or by their own internal rhythm.

I think I need a nap…

"Man… I don't know how anyone can eat broccoli. [Brother responds] I can... and I love it! I pretend I'm a giant, and I'm eating trees." From comic strip "Soup to Nutz" in the Valley Courier