Researchers discover a way to delay Christmas tree needle loss

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Researchers at Universite Laval, in collaboration with Nova Scotia Agricultural College, have discovered what causes Christmas tree needles to drop off, and how to double the lifespan of Christmas trees in homes. The authors presented their findings in a recent issue of the scientific journal *Trees*.

The researchers have identified a plant hormone—ethylene—responsible for needle loss in balsam fir. They made the discovery by placing fir branches in containers of water inside a growth chamber. After ten days the branches began to produce ethylene and, three days later, the needles began to drop. After 40 days, the branches were completely bare.

To test that the needle loss was in fact due to the ethylene, the researchers used two chemical compounds that interfere with this hormone: 1-MCP and AVG. After exposing the branches to one of these two products, the needle retention period rose to 73 and 87 days, respectively.

"By Day 40, the branches that had been treated were still green, tender, and fresh-looking, while the untreated branches had lost virtually all their needles," explains Steeve Pépin, co-author of the study and professor at the Faculty of Agriculture and Food Sciences at Université Laval.

These findings could have a significant impact for Christmas tree producers and consumers alike. "Since 1-MCP is a gas, it would be

feasible to release it into the trucks used to ship the trees," suggests Pépin. This would be particularly useful for the export market. In 2008, Christmas tree sales topped $65 million in Canada, and half of the sales were generated by exports of some 1.8 million trees to the United States, Mexico, Central America, South America, and the Caribbean.

Consumers also stand to benefit from this discovery since it would be possible to dissolve AVG in the water added to the tree stand, which would prolong the tree's lifespan indoors. "What is really encouraging is that we managed to double the needle retention period of the branches," notes Steeve Pépin. "However, we still have to prove that we can transpose these findings to the entire tree," he concluded.

Provided by Universite Laval