

AN EVALUATION OF CHRISTMAS TREE PRESERVATIVES



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A couple of years ago, a grower asked me to evaluate a Christmas tree preservative packaged by Peters Fertilizer Company and sold by one of his major chain store customers. Several of his trees had lost needles when consumers treated them with this preservative. Trees were returned to stores with abnormally heavy needle loss. The consumers had used this Christmas tree preservative according to label directions using the provided measuring spoon. While the grower "made it right" with his customer, he resented paying for a problem created by another product sold at the store. None of his other wholesale customers experienced similar problems with the fresh trees they received.

When I looked for the Christmas tree preservative online, Peters had discontinued its production. When I went to the chain store the following Thanksgiving, a new Christmas tree preservative packaged by EZgardner was prominently displayed by the garden center sales register. EZgardner Christmas tree preservative was packaged as 2-inch long pellets to be conveniently added to water on a weekly basis. I bought some of it to test alongside the Peters product that the grower had given me.

I started with a small pilot study in my office using branches cut from the same ten trees. I started with three treatments: clean tap water, the Peters preservative, and the EZgardner preservative. I added first doses of the preservatives to the water according to their labels. I maintained water levels without adding additional preservative even though the labels called for additional material at weekly intervals. Branches were lightly brushed at weekly intervals to evaluate needle loss.

I rated needle loss on a 7-point scale shown in the box. Points "1" through "4" on the scale are all less than 10% needle loss because even a small loss is unusual for Fraser fir. From ratings of "1" to "3," dropped needles are visible on the surface below the branch, but not readily on the shoots. Gaps between needles become more visible at a rating of "4." Ratings of "5" or "6" reflect serious visible needle loss and one of "7" represents extensive needle loss with much of the branch stem being exposed.

After three weeks, the 10 branches kept in tap water exhibited an average needle loss rating of 2.4 or about 1-3%. The Peters treatment exhibited an average needle loss of 4.5% - enough to make the foliage start to look ragged. The EZ Gardener product induced very heavy needle loss on most branches for an average rating of 6.6. Both preservatives were clearly

Needle Loss Rating

- 1 < 1%
- 2 = 1-3%
- 3 = 3-5%
- 4 = 6-10%
- 5 = 11 -20%
- 6 = 21-50%
- 7 = 51+

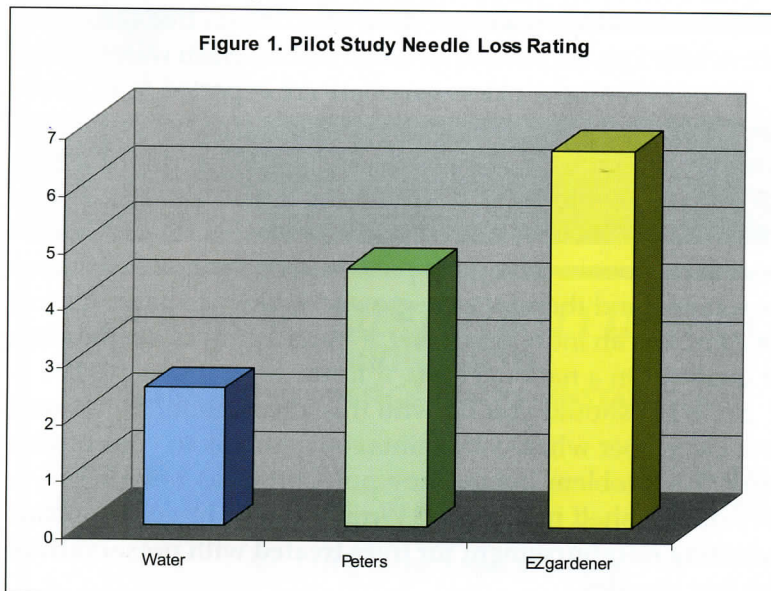
detrimental to the durability of Fraser fir foliage.

The results of this simple test were supported in the literature by several studies including ones conducted by Eric Hinesley and Sylvia Blankenship at NC State University and Gary Chastagner in the Pacific Northwest. They had found preservatives, both commercial products and home remedies, to be of no benefit at best and in many cases harmful to tree quality compared to clean water.

However, a ten-branch sample lacks the statistical strength on which to base product criticism. I needed to do a larger study to be sure of my results.

I followed the pilot study up with a more inclusive study including six retail Christmas tree preservatives, two recipes for homemade Christ-

Figure 1. Pilot Study Needle Loss Rating



Treatments:
 check
 Forest Fresh
 Keeps It Green
 TreeLife
 Syrup & bleach
 Prolong
 Peters
 Syrup
 EZgardner
 ½ tablet
 1 tablet

mas tree preservatives, and a clean water check. The retail preservatives were all applied according to their label directions. A half rate of the EZgardner product was included in the study along with the full rate since the labeled rate resulted in extensive needle loss in the pilot study. Branches from 30 trees were assigned to each of the ten treatments to minimize any genetic variation. The treatments are shown in the sidebar.

The branches were collected from a field of Dale Cornett's in Watauga County on the afternoon of November 20, 2008. Treatments were set up the following day. The branches were put into a heated basement room at the Mountain Horticultural Crops Research Station. All thirty branches for each treatment were kept in a common bucket. The ten treatment buckets were spaced uniformly from the light source in the room. Ten hours of light were provided each day using a timer. Relative humidity in the room ranged between 55 and 65 percent as monitored by a sling sychrometer. Water levels were monitored three times a week. Additional water and preservatives were added two weeks into the study to bring levels up to original line.

Needle loss of current year foliage was rated at the end of the second week and again after the fourth week. Needle loss from wet foliage on branch ends submerged in the buckets was not rated. While several treatments including the water check exhibited almost no needle loss at week 2 (a rating of 1.1 represented about 1% needle loss), all treatments exhibited some needle loss by week 4. The spread between treatments also increased with time.

Figure 2 shows the average needle loss rating of the different treatments at week 4. The check yielded significantly less needle loss than all other treatments except Forest Fresh preservative. After a month, less than three percent of the needles shed. At the other end of the spectrum, the full rate of EZgardner resulted in significantly more needle loss than any other treatment. While the average rating of 4.9 represented a needle loss percentage of about 20%, some trees were rated at "7" with severe needle loss. Other preservative treatments overlapped to a great degree. Forest Fresh and Keeps It Green exhibited slightly less needle loss than the other preservative treatments but were only significantly different from the corn syrup treatment and the two EZgardner treatments. It is noteworthy that both treatments of the EZgardner preservative resulted in the most needle loss in the study.

Similar to past studies, the addition of Christmas tree preservatives did not improve needle retention of Fraser fir foliage. In fact, some products, both homemade and commercial, have harmed fresh cut Christmas tree foliage. Whether it is sugar, salt, or fertilizer, chemical contaminants in water given to a Christmas tree can aggravate needle loss. As others have said before, clean water is best.

In today's marketplace, suppliers are expected to fix problems that might arise with their product – no questions asked. However, when a retailer aggressively sells an additive that has been shown to harm a Christmas tree, it is not automatically the grower's fault if the tree drops needles. The better job the retailer does in selling the preservative, the more problems the retailer (and therefore the grower) is likely to have. It's just not right. On an individual level, it hurts a grower's reputation for quality. On a national basis, it hurts the real tree market.

So, what should you do with this information? Don't wait until December when complaints come in. Talk to your buyers about this problem before they put Christmas tree preservatives on the shelf in October! **Write a clause in your contract excluding reimbursement for trees treated with preservatives that lost needles.**

Figure 2: Needle Loss Rating - Week 4

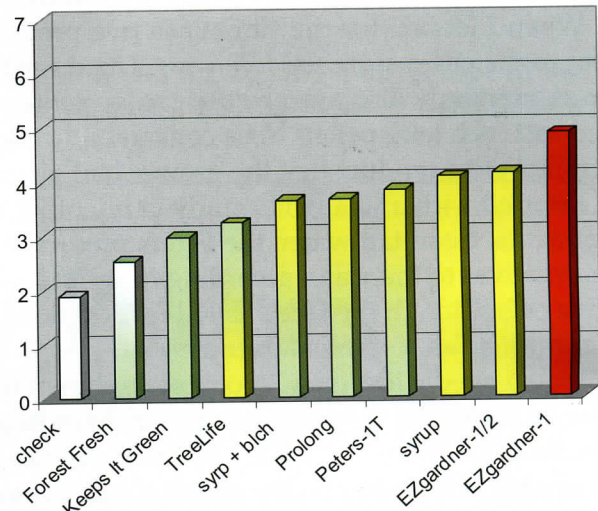


Figure 3. Needle retention of check branches in water after 4 weeks (rating = 1.9).




Figure 4. Distribution of needle loss across branches treated with EZgardner preservative after 4 weeks (rating = 4.9).

The use of brand names and any mention of commercial products or services in this publication does not imply endorsement by the North Carolina Cooperative Extension Service nor discrimination against similar products or services not mentioned.

REFERENCES

Hinesley, L.E. and S.M. Blankenship. 1991. Effect of water additives on Fraser fir needle retention. Hort-Technology 1:90-91.

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Calendar Of Events

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| September 24 | BOD / FFPC & Opening Reception of NCCTA's 50th Anniversary Celebration
LaQuinta Inn, Boone |
| September 25 | Summer Meeting & Trade Show; NCCTA 50th Anniversary Celebration - LaQuinta Inn, Boone |
| September 26 | Farm Tour |
| January 11-12 | BOD / FFPC Leadership Retreat
Valle Crucis |
| March 4 | BOD / FFPC Meeting |
| March 5-6 | NCCTA Winter Meeting |