

# How to Deliver Fresh Trees to Retail Customers -

## Patterns of Tree Care Based on the 2003 and 2004

### NC State University Freshness Surveys

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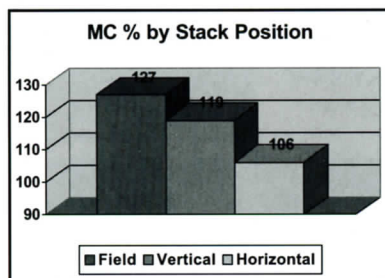
After two seasons of visiting Christmas tree farms and retail lots to measure Christmas tree moisture content, NC State faculty can point to Christmas tree care practices that keep trees fresh and to major factors that dry trees out. These two years of survey data will provide the basis for a pilot educational program to address care issues on the retail level.

## Patterns of Tree Care on the Farm

During the week before Thanksgiving in both 2003 and 2004, NC State University faculty visited Fraser fir Christmas tree farms in Alleghany, Ashe, Avery, and Jackson Counties of North Carolina. We evaluated storage conditions at each site and collected foliage samples from trees at storage yards and fields to measure moisture content. Twenty-four pairs of fields and yards were sampled in 2003. In 2004, 31 storage yards and 21 fields were sampled.

Most farmers did an excellent job of harvesting and storing their trees. The vast majority of trees were shipped to the retailers with acceptable moisture content (see the side bar). In 2004, we observed only a slight but significant decrease in the moisture content of trees cut early during harvest compared to those sampled in the field. This moisture loss included a slight increase in the number of trees with marginal moisture content. Problem trees were definitely "an exception to the rule," but there were a few more exceptions as time in storage increased.

A small number of trees sampled in the field as well as those cut early in the season exhibited marginal moisture content and premature needle loss. These trees may have failed to achieve dormancy. This observation matches problems that growers have experienced in warm years. While only a handful of trees were affected out of more than 900 trees sampled, it highlights a real concern about the variability of dormancy and needle retention in Fraser fir.



Two storage factors had a significant impact on the moisture content of trees on the farm: the method of stacking and the type of shade. In 2004, trees stored vertically contained almost as much water as trees in the field, but those stacked horizontally exhibited significantly lower moisture content. This same subset of horizontally stacked trees was covered by shade cloth tarps laid directly on the pile in full or partial sun. Trees piled and covered this way were significantly drier than those covered by any other type of shade. In practice, horizontal stacking and tarps are used together. Both raise a red flag regarding freshness.

Only two farmers were observed using irrigation at their yards in 2004, yet irrigation systems were observed at many storage yards. The 2004 harvest season was characterized by average precipitation but it was warm. Trees at some yards would have exhibited higher moisture contents and even fewer problems if irrigation had been employed rather than saved for a full-scale drought.

## Moisture Content Thresholds

### ◆ Acceptable - greater than 100%

Tree in good condition and likely to rapidly rehydrate under proper care

### ◆ Marginal - 80 to 100%

Tree capable of slowly rehydrating under proper care

### ◆ Critical - less than 80 %

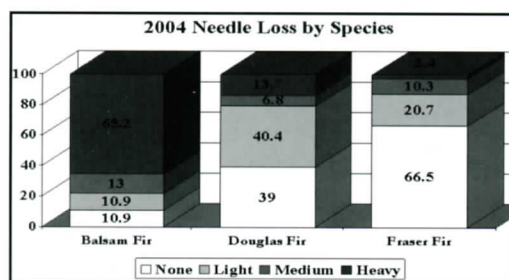
Tree unlikely to substantially rehydrate even under proper care and will likely continue to dry out



# Patterns of Tree Care Among Retailers

In early December of 2003 and 2004, NC State University faculty visited retail Christmas tree lots in the Raleigh, NC area and Florida to evaluate Christmas tree care practices and tree freshness. In Florida, we visited the Ft. Lauderdale/Miami area in 2003 and Tampa/St. Petersburg area in 2004. We collected foliage samples for moisture content determination from Christmas tree vendors' stored and displayed trees and appraised vendors' tree care practices.

Retail Lots Visited		
Year	2003	2004
NC	42	26
FL	31	29
<b>Total</b>	<b>73</b>	<b>55</b>

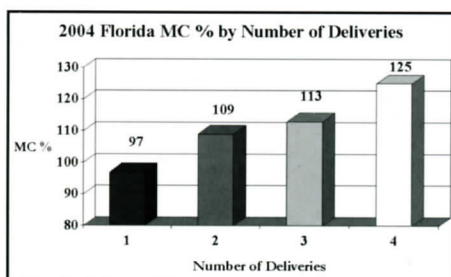
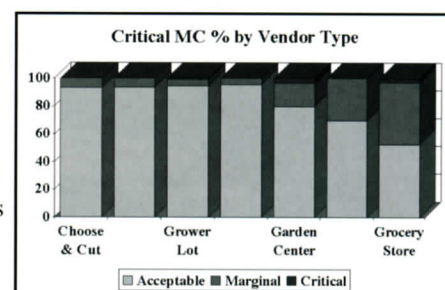


Most Fraser fir Christmas trees on the retail lot were fresh, with supple foliage and adequate moisture content. Other Christmas tree species measured in quantity included Balsam and Douglas fir, neither of which held up as consistently as Fraser fir. Eighty one percent of the Fraser fir exhibited little or no needle shed compared to only 22 % of the Balsam fir. Where 2 % of Fraser firs exhibited heavy needle loss, 14 % of Douglas fir and 65 % of Balsam fir were shedding heavily.

While customers in both North Carolina and Florida had to pay a higher price for a higher grade of tree, there was not always a correlation between the price of a Christmas tree and its freshness. In Florida, better quality and higher price did not translate into greater freshness. Independent retail lots and civic groups had virtually the same freshness scores (a subjective grade given after the site visit) as the big box stores. There was only a slight relationship between higher moisture content and higher price. Basically, your odds of getting a fresh tree were the same whether you paid \$35 or \$60.

In North Carolina, a different pattern emerged. Grower-operated retail lots sold the freshest, highest quality, highest priced trees. There was a strong relationship between vendor type and freshness. This was documented both in the freshness scores and to a lesser extent, moisture content.

However, no segment of the retail market (chain store, garden center, grocery store, choose & cut farm, civic group, or independent retail lot) was altogether free of problem trees. Every retail vendor type included operations where tree care practices failed to keep trees fresh. At some retail sites, just a few older trees exhibited freshness problems. At other retail sites, customers had to pick through sun-scalded trees or trees with easily shedding needles to find one that was holding up well. Generally, the best care by retail segment occurred at independent lots operated by Christmas tree growers. The worst conditions existed at grocery stores where trees displayed at storefronts were exposed to sun and drying wind.



When moisture content was analyzed with care practices, the following factors appeared to be significant: number of deliveries, type of shade structure, irrigation type, irrigation frequency, and type of stand.

Setting up multiple deliveries for a retailer's inventory made a big difference in the moisture content of Christmas trees on display. Two deliveries were better than one, and three or four deliveries were better than two. It makes sense -- multiple deliveries allow growers to cut later those trees that will be sold later. Storage conditions are generally cooler at mountain farms than on retail yards. Multiple deliveries provide trees that are just as fresh for late season customers as for early customers. Multiple deliveries can add transportation expense, but there are often other Christmas tree retailers happy to share the cost of a partial load.

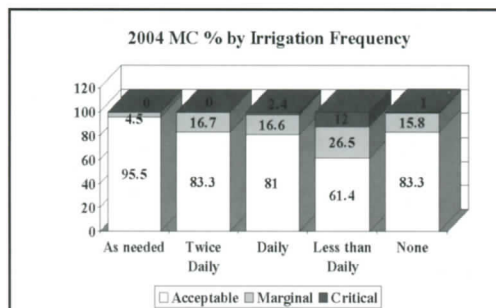
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# Patterns of Tree Care

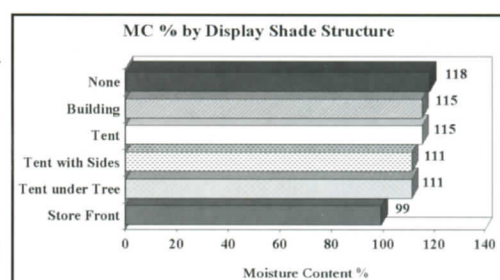
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The type of shade structure can be very important. One type of shade – storefronts – yielded trees that were significantly dryer than other types of shade. Most storefronts fail to shade trees enough hours in a day to keep them fresh. Other types of shade included tarps, tents, tents with sides, lath house structures, natural shade from trees, and the inside of buildings. Problems with needle loss were associated with tarps, buildings, and tents with no sides as well as storefronts. Problems with sunscald, in which needles on exposed branches turn red, were observed under tarps and tents with no sides as well as storefronts. Ultimately, exposure to sun and wind can degrade the freshness and quality of trees within a few hours.



No location or shade structure will adequately protect cut Christmas trees without additional care. Perhaps the most important tree care activity is the frequency of watering both in storage and display. Irrigation can offset other deficiencies such as lack of shade at a retail site. Regular daily watering maintained higher moisture levels and resulted in fewer problem trees than less frequent irrigation. In fact, irregular irrigation represented just as many problem trees as not irrigating at all.

The type and sophistication of irrigation did not seem to matter as much as the frequency of irrigation. One grocery store kept their trees watered and fresh in homemade, trash-bag-lined, cardboard box tree stands. Some retail lots have created shallow landscape-timber-and-tarp pools in which to store their baled trees with their trunks in the water. Many retailers hand-water the mulch or sod underneath their trees. If high humidity is maintained, trees will not lose moisture content as quickly. If trees are watered through their trunks, they can actually increase their moisture content and recover lost freshness.



Retailers can easily store trees in shallow pools.

Stand type used in display was highly significant. The pin system provided both the best and the worst moisture content averages. When used with water-filled bowls, the pin system represented the freshest trees. When used dry, the pin system represented the driest trees with the greatest number of trees in critical condition that might not re-hydrate. Again, water makes the difference.

Almost every retailer surveyed provided fresh cuts to their customers' trees. Some applied fresh cuts before storing or displaying their trees in water on site. In this case, the cut provided to their customers was actually a second cut. Other Christmas tree freshness research has repeatedly identified the importance of making that fresh cut before displaying the tree in water. Trees will take up more water more easily if that cut has been made shortly before being placed in water.

## Freshness Education Where It Counts

Two years of regional data have identified problems in the care and handling of Christmas trees. An educational effort could go far in solving Fraser fir freshness issues, but it isn't the grower who needs educating this time. Most retailers need help understanding the care a perishable Christmas tree needs, but managers and employees at grocery stores need the greatest help if the surveys are any indication.

The NCCTA long range planning committee is currently developing a short freshness education program for retailers. Selected grocery store chains will be the first targeted audience of this educational effort. However, we will only solicit those chains that buy from growers who want to be part of the program.





## Patterns of Tree Care


The ten-to-fifteen minute program will include an overview of Fraser fir production, growers' storage techniques, 2003-04 NCSU survey data, freshness problems, and care recommendations. Participants will understand what cut trees need and learn ways to provide care within the constraints of their own chain store. Information will be presented initially using a PowerPoint format and a booklet on tree care. As the program develops, we hope to provide other formats such as an interactive website, CD's, and possibly a DVD of the presentation. The pilot program will be presented to 1 or 2 chain stores this fall with plans to expand next year.

### The Total Freshness Package

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|--|--|
| <ul style="list-style-type: none"> <li>• Multiple deliveries               <ul style="list-style-type: none"> <li>- Less storage</li> </ul> </li> <li>• Infrastructure               <ul style="list-style-type: none"> <li>- water</li> <li>- shade (roof &amp; sides)</li> <li>- space</li> <li>- tree stands</li> <li>- substrate</li> </ul> </li> <li>• Education</li> </ul> | <ul style="list-style-type: none"> <li>• Confounding factors               <ul style="list-style-type: none"> <li>- days on site</li> <li>- Not enough space</li> <li>- picked over trees</li> <li>- unused infrastructure                   <ul style="list-style-type: none"> <li>• empty bowls</li> <li>• unused hoses</li> <li>• open tents</li> </ul> </li> </ul> </li> <li>- ATTITUDE</li> </ul> |
|--|--|

The pilot program will be customized to the individual chain stores that take part in it. The growers (NCCTA members) who supply the participating chain stores will be involved in a steering committee which will oversee program design and may even help to conduct the training. Jeff Owen, Area Christmas Tree Specialist, NCSU and Bill Glenn, Marketing Specialist, NCDA & CS, are currently developing a draft of the program curriculum to share with the steering and long-range planning committees.

While teaching food store employees about Christmas tree freshness and care, we will also be promoting North Carolina Fraser Fir. If we can inspire our audience, they will be better sales people for our product. In the vision of the long range planning committee, Christmas tree education, care, freshness, quality, and sales all go hand-in-hand.

In conclusion, the NC State University surveys identified key factors involved in grower and retailer Christmas tree freshness. Fresh trees can be sold all season if a tree care package is used that includes multiple deliveries, adequate shade, fresh basal cuts, and irrigation of both stored and displayed trees. Take short cuts on tree care and the Christmas trees will tell on you! Needle loss and sunscald that show up on retail lots reflect inadequacies in tree care -- usually on the lot but sometimes from the farm. None of these recommended practices represent insurmountable burdens to the efficiency or cost effectiveness of either farm storage yards or retail lot operations -- we observed them on neighboring farms and in the market place on competitors' lots. Recommended practices are doable. We still have much to learn about conditions on the retail lot, but we can move forward with what we already know. Watch for a Freshness Education program in the near future. 



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