

# Fire Safety: Just add water!



Every holiday season, at least one fire marshal or TV reporter creates a media event by setting a dry Christmas tree on fire in front of cameras. While proper tree care may be reported in the story, the underlying message is that real Christmas trees are dangerous. Usually, just the one dry tree is set on fire. The image of a tree in flames is seldom counter-balanced with that of a well-watered fresh tree resisting ignition.

In light of this one-sided presentation of Christmas tree fire safety, we decided to see what it would take to present a more balanced demonstration. This spring we conducted a practice run to prepare for a public demonstration this coming fall. Several Fraser fir Christmas trees were cut on March 21, displayed on March 30, and ignited on April 24. Comparisons were made between trees treated with fire repellent and those without and between trees watered during display and those without. One treatment simulated the conditions a tree might undergo after a late season sale where a long period on the retail lot is followed by a shorter display period.

The trees were handled in a manner to simulate different stages of the harvest season. The trees were cut and stored outside under pine trees for a week to simulate farm storage prior to initiating the demonstration. Then they were stored on the shady side of a building for four days under conditions similar to many retail lots. The trees were then set up in different treatments and displayed for 25 days.

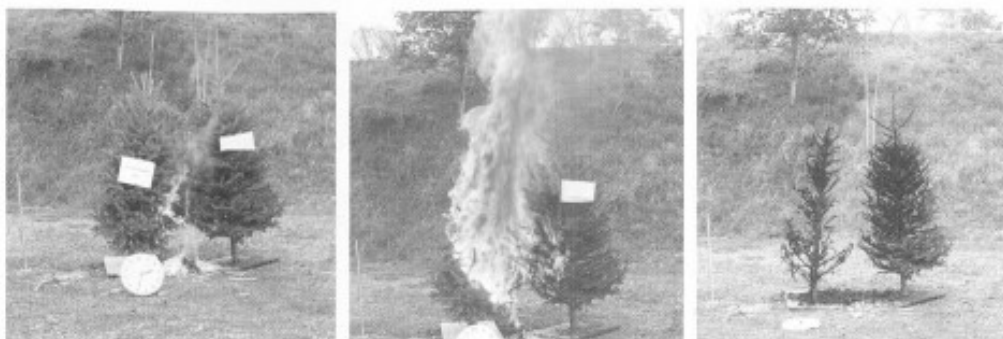
By April 24 when the trees were ignited, those without water felt extremely dry and brittle. The needles were stiff to the touch. Not only was the texture different from a fresh tree, but the foliage on the dry trees was noticeably warmer to the touch than the foliage of the watered trees. Also, the color of the dry trees changed from the original dark green to a paler, washed-out green. We ignited the trees in pairs to show the difference between treatments.

The first comparison was between a dry tree and a watered tree. The second comparison was also between a dry tree and a watered tree – both of which had been treated with a fire retardant. First, single twigs were ignited with a butane torch. Then, a paper fire was started between the touching paired trees. The results are shown below.

The pictures in Figure 1 show the paired ignition of a dry and a watered tree. The fresh tree resisted ignition until dry tree was completely engulfed. At that point, the dry tree was radiating enough heat to burn the paper sign on the fresh tree but the foliage the sign was taped to did not burn! Only when dried out by a blazing fire a few feet away, did adjacent branches on the fresh tree burn and then so slowly that the tree never became engulfed in flames. Adequate water in the tree protected the foliage. The next paired burn was between the two repellent-treated trees.



**Figure 1. A fresh tree displayed in water (left) versus a dry tree displayed without water (right).**



**Figure 2. Two trees treated with fire retardant: displayed dry (left) and displayed with water (right).**

was never completely engulfed. The only difference between these two trees was regular watering during display. Water – not fire retardant – made the difference in the combustibility of these two trees.

In the sequence left the lighter-colored dry tree was on the left with the greener, watered tree on the right. The Figure 1. A fresh tree displayed in water (left) versus a dry tree displayed without water (right). fire retardant treatments appeared to slow the spread of the fire and result in more residual foliage. Yet, the presence of a fire retardant did not slow the combustion of the dry tree by more than 15 to 20 seconds. Despite the intense fire next to it, the watered tree smoked and only slowly caught fire. The fresher tree



These pictures show that a well-watered tree will not only resist ignition but resist combustion from an open fire. If water content does make a difference in fire safety, then any efforts to protect the freshness of Christmas trees on the retail lot are well justified. Further, educating customers about tree care and the importance of consistent watering becomes an absolute necessity.

If we can contrast the image of a Christmas tree on fire with the image of a fresh tree resisting combustion from a 10 foot high flame, we can reduce damage to the reputation of real Christmas trees. Add to that the image of an artificial tree on fire or even other household items put to the same ignition test as a real Christmas tree, the safety of a fresh Christmas tree might be seen in a more favorable light. Properly cared for, we should really have bragging rights regarding Christmas tree safety!

## **Please share the following safety information with your retail customers:**

### **Points to know about Christmas tree holiday safety:**

- No Christmas tree ever started a fire – something else had to burn first.
  - Other household items are much more likely to be the first item ignited in residential fires:
  - Newspapers & magazines – 13 times more likely
  - Packaging – 10 times more likely
  - Curtains or drapes – 9 times more likely
- Overloaded electrical circuits or faulty wiring are the most common ignition sources for holiday household fires.

### **Holiday safety precautions**

- Put your Christmas tree in a stand that will not tip over and holds at least one quart of water per inch of stem diameter.
- Place your Christmas tree well away from heat sources and direct sunlight that can dry the tree out.
- Inspect Christmas tree lights before using them. Replace if worn. Do not overload electrical circuits.
- Turn off your Christmas lights when leaving the house or going to bed.

#### **Sources:**

National Fire Protection Association. URL: [www.nfpa.org](http://www.nfpa.org)

National Christmas Tree Association. URL: [www.christmastrees.org/safety.cfm](http://www.christmastrees.org/safety.cfm)

Michigan Christmas Tree Association. URL: [www.mcta.org/firesafety.htm](http://www.mcta.org/firesafety.htm)

E. Hinesley & G. Chastagner (1998). Commercial Storage of Christmas trees.

URL: [usna.usda.gov/hb66/155christmastrees](http://usna.usda.gov/hb66/155christmastrees)