



TO: Pennsylvania Christmas Tree Growers, Retailers, and Consumers
FROM: Ricky M. Bates, Ph.D.
RE: **Douglas-fir Needle Drop**
DATE: December 18, 2009

The Douglas-fir grown in Pennsylvania originate almost exclusively from the Lincoln National Forest of New Mexico. Trees grown from this seed source have a proven track record for excellent post harvest performance. Traditionally, premature needle drop is rarely observed in healthy trees that have been treated well and harvested during November. This year however, is different. Christmas tree growers and retailers in certain regions of eastern Pennsylvania are noticing significant premature needle drop from Douglas-fir. Why is this occurring?

At this time, I must admit that there does not appear to be a simple, straightforward answer to this phenomenon. It does however seem clear that we are witnessing a reaction by Douglas-fir to climatic conditions prevalent in the eastern part of the state between late summer and harvest, namely significant precipitation in October and above average temperatures in November. For example, during October, twenty-one eastern Pennsylvania counties experienced rainfall greater than 75% above normal, and eleven counties experienced rainfall 51-75% above normal (see: http://www.erh.noaa.gov/marfc/Maps/PANY_counties_oct2009_color.htm). Temperatures were also well above normal for portions of November. This weather pattern likely resulted in a scenario which produced stress within the trees, thus delaying the normal onset of dormancy. It is well-documented that trees experiencing delayed dormancy tend to have higher rates of needle loss once harvested. It is also possible that the weather conditions directly adversely affected the physiological processes within the tree responsible for good needle retention.

Unfortunately, there is no quick and easy field procedure that can be used by a Christmas tree grower to determine the level of dormancy present in a particular block of trees, or if the trees are at risk. Growers traditionally monitor the weather, wait for cool temperatures, and begin harvesting in November. Once cut, trees on most farms are protected from desiccation by a variety of methods. This process has resulted in the harvest of high quality Douglas-fir from Pennsylvania farms for decades. However, as stated earlier, this year was different. I observed trees harvested as late as Thanksgiving, handled well on the farm, and protected from desiccation on their way to retail lots. Some of these trees still exhibited unacceptable needle loss within one week. Early indications are that most trees harvested during mid-December did not experience this degree of premature needle loss. This would indicate that the situation was brought on by weather-related factors which affected the development of dormancy in the trees. Unfortunately, most retailers cannot wait until mid-December for shipments of trees.

And this is why farming, by nature, is a risky business. Crop quality depends in part, on the weather. And every year the weather is different.