



Cytospora canker, a fungal disease, is the most common reason for unnatural needle drop on Colorado blue spruce and several other spruce varieties. The fungal diseases are not common unless the tree is experiencing some stress due to outside conditions outlined below, such as poor soil conditions, excess or not enough water salinity (if there is a pool in the area that has been draining into the water table around the trees).

Source of stress	Effect on tree
Adverse temperatures such as extreme winter cold; fluctuating above and below freezing temperatures in mid-winter; and extreme heat in summer.	Winterkill, delayed winter injury, heat stress may cause damage to the cambian layer just beneath the bark. This damage interferes with the uptake of water and nutrients.
Drought.	Lack of water damages or kills back some of the root system, in particular the tiny and sensitive root hairs.
Flooding, including: <ul style="list-style-type: none"> <li>• overland flooding from extreme weather events</li> <li>• a high water table</li> <li>• changes to drainage (sump pump outlet or downspout directed at the root zone)</li> <li>• nearby dugouts or sloughs that are full or overflowing</li> </ul>	Prolonged exposure to standing water causes damage to the root hairs of the trees – these are specialized, very fine roots which are responsible for water, nutrient and oxygen uptake in the trees. When these roots are damaged, the trees are not able to pick up enough oxygen which is needed for photosynthesis. This causes the trees to be stressed and the needles to die out much faster than normal.
Salinity caused by high water table, sidewalk salts, road salts, nearby dugouts or sloughs.	Water in the soil that has a high concentration of soluble salts is said to be saline and causes salinity. The salts in the water is toxic to trees, shrubs and other plants.
Soil compaction from construction or heavy equipment; or when trees outgrow a space confined by sidewalks, houses or driveways.	Fifty percent of soil is generally minerals and other materials, 25% is water and 25% is air space. Compacted soil has very low air spaces. Roots need these spaces for the uptake of water, oxygen and nutrients. Compacted soil also tends to stay wet which causes root rot.
Trees that are planted improperly.	Most common effect is root girdling which leads to the death of the plant. Same with planting too deep or anything that interferes with or constricts the bark. All of these things interfere with the uptake of water, oxygen and nutrients.
Planting the wrong tree for the existing site conditions.	For example, Colorado Blue Spruce are very sensitive to prolonged exposure to standing water, a leading cause of water stress leading to extreme needle drop. They do best in soils that drain quickly. If your site tends to be wet, try white spruce ( <i>Picea glauca</i> ). These are native to the northern boreal forest and naturally grow near streams and rivers.