



## *Walking Around in My Snow Globe*

*by Marilyn Loser*

2011 December 21

Mother Nature has flocked Alamosa with hoar frost several times this December. Some mornings are foggy, but a few have our brilliant blue sky backing the white crystalline landscape. My heart still skips a beat as I walk around the yard and shake a tree limb that replies with a shower of glittering white. I feel I'm inside my own snow globe – you know those spherical glass worlds you hold in your hand, turn upside down, and then back upright so you can view the magical falling flakes.

Naturally, I got to wondering why we're seeing so much and if the hoar frost damages trees. As far as I can tell from scouring the web, this type of frost doesn't harm trees. I'll get to damaging frost cracks in a bit.

Frost forms when water vapor freezes into ice crystals on cold surfaces. In winter, temperatures are usually low because the sun is low in the sky during the day and the nights are long. On clear nights, when there is no blanket of clouds to keep the warmth in, so any heat received during the day quickly radiates into space. The temperature drops, and frost forms when the moisture in the air freezes.

Why is frost white rather than clear if it is really ice? It is because the crystals contain air.

Have you ever looked closely at frost? We see three types of frost in Alamosa that occur in different ways, according to the Clouds R Us website.

1) Hoar frost occurs when water vapor touches a very cold surface and freezes on it instantly. This happens to the leaves and branches of plants when frost covers them with ice crystals that look like spiky fingers. Hoar frost can occur on other freezing surfaces such as soil and metal, so is often on cars. Hoar frost can occur at higher temperatures than other kinds of frost – usually when the air temperature is around 0°C (32°F). Because the ground is usually colder than air, the air must be moist for these ice crystals to form.

2) Rime frost: Rime is ice formed when a damp, icy wind blows over flowers, branches and other surfaces. Rime frost looks like icing around the edge of petals and leaves, and only occurs when temperatures are very low.

3) Fern frost: In particularly cold weather, fern frost may appear on windows. This happens when tiny water droplets (dew) first form on the cold glass. The dew turn into ice and more moisture freezes on top. As this process continues, more ice crystals form – the frost develops into what looks like feathery

fingers. Fern frost can create beautiful patterns of ice crystals, which often look leaf or fern like – hence the name.

The word hoar is off-putting for many people since it sounds like another word. I found two different explanations for the term. Wikipedia says, “The name hoar comes from Old English and can be used as an adjective for showing signs of old age in reference to the frost which makes trees and bushes look like elderly white hair.”

The Landreth Seed Company offers a different explanation. “The word hoar is derived from a very old German word, hehr, which appeared for the first time during the early 1300’s. In those days, hehr meant sublime – the meaning today is attached to the scientific phenomenon sublimation. Sublimation occurs when matter skips one of the three states it can obtain: gas, liquid or solid. It occurs when gases skip the liquid state and immediately become solids. We see this when dry ice ‘melts’ by forming a dense gaseous fog.” The word hehr evolved into the word hoar.

What about frosts that damage trees? Fall and spring frosts are more likely to damage trees than winter frosts. As trees enter hibernation or leave it, liquids begin to flow within the trees and a quick, extreme drop in temperature can cause the liquid to freeze within the tree cells, causing the cells to burst and damage the tree.

In winter, trees can develop frost cracks from internal stresses in the tree trunk. Frequently these cracks open up in coldest weather and close again as the weather warms. Ash and maple are especially prone to frost cracking. Frequently, cracks open in the same place year after year resulting in a callus ridge ("frost rib") down the side of the tree. As long as the tree is otherwise healthy, frost ribs do little harm.

*“The sun has ‘ears’ and the stars are bright at night – Heavy frost is coming.” “Hoar frost at night – a sunny day tomorrow.”* Russian weather proverbs