

## Using Manmade Snow to Protect Outdoor Perennials

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Skagit Gardens is a wholesale grower of bedding plants and container-grown herbaceous perennials. We are located at sea level lat. 48.5°N in northwestern Washington state. We overwinter about 2 million plants per year outside

Hardiness varies greatly among varieties but, in general, a plant is much less hardy in a pot on top of the ground than it would be if planted in the ground. Our particular climate can be cold in the winter (below 10F) for several weeks at a time. Due to our strong marine influence, it can also be in the 50s and 60s in the winter. Our experience has been that greenhouse grown plants tend to be soft and leggy if the weather gets unseasonably mild and we cannot reliably produce a plant that will be hardy in the interior regions of the continent. We do carry a crop of perennial liners in the greenhouse through the winter and some of the 4-in. crop inside to help with early availability for the local and warmer climate customers. These houses are kept as cool as possible. Since the plant produced outdoors is the hardier and more desirable plant to our customers, we must seek ways to protect the crop and reduce shrinkage through the cold spells that we can get. Since the weather can get very mild causing the plants to begin growing, we are not able to simply cover the crop for the entire winter. Our best crops have been in years when we had a good snowfall preceding an extended cold period. These crops were actually better than the crops in mild winters since they didn't overgrow. With this in mind, we decided to make artificial snow to cover the crop during severe cold weather. The snow naturally melts, exposing the plants to the normal environment when the weather gets mild.

We purchased a snow gun, a fire hose and an after-cooler (a radiator to cool the compressed air) for the snow making operation. Two hoses transport water and air to the gun. The most expensive piece of equipment needed to make snow is the compressor. We rented it so we were able to keep costs quite low. Compressed cooled air is mixed with water at the gun and when the temperature is below freezing, snow will result. At least 100 psi at the gun is required for good results and it requires a considerable amount of time to get a good protective layer on. We were able to blow snow about 75 ft but the operation is strongly affected by even the slightest breeze and it is a very slow process. We place our crops in the field by hardiness and at the early signs of an extended arctic front we cover the plants with a fabric called Typar. When temperatures are cool enough we begin making snow to cover about 2 to 3 acres of plants with 2 to 3 in. of snow. This took us about 2½ days. The operation is carried out around the clock until the crop is covered sufficiently. This is necessary because the hose carrying the water would freeze if you stopped. Using this technique we have been able to maintain soil temperatures of near 32F when the ambient air temperature was reaching 9F at night and not above 20F in the day for about 10 days.

Since we used a combination of fabric and snow to protect the plants, we cannot know the extent to which the snow alone helped protect our crop. But the results were very good with excellent survival in the kind of winter weather that has produced substantial losses in the past. We are presently planning to use two guns next winter if the weather gets cold enough.