Side-by-side Snomax® test increases snow production by over 40 percent

A leading ski resort in New Zealand was concerned about the snow production at their resort. Although consistent, small particle snow was being produced, not enough of it was being made, or staying frozen for a significant amount of time. With a water shortage problem, the resort needs to get the most mileage out of the existing water supply.

Knowing that Snomax works on the water, not the gun, Johnson Controls suggested that the resort conduct a side-by-side Snomax test at the recommended concentration rate with their current snowmaking equipment. Johnson Controls indicated that by using Snomax, a 30 percent increase in snow volume can be achieved, or conversely, that trail coverage can be duplicated with 30 percent less water.
Testing procedures

1. The test was conducted by ski area personnel with support from the local Snomax distributors, using two identical guns. The guns were run on the fan gun manufacturer’s automatic setting and the snow quality settings were maintained at the same levels.

2. The water pressure was identical on the guns by using the main high-pressure manifold and another hydrant outside the pump house.

3. Snomax was injected into one gun using a fitting rigged to feed the Snomax gun. It was important that no Snomax be allowed to get into the other gun.

4. Bamboo was placed in grids 10m from the base of the gun in the down wind position.

5. A 10-meter by 20-meter rectangle grid was staked out with bamboo sticks one meter apart and two meters deep.

6. The guns were allowed to run all night.

Testing variables

Temperature gauges on the fan gun showed a difference of .2 degrees Celsius wet bulb and pressure was one bar or less on the Snomax gun at all times, which was attributed to instrument error, as the guns were so close together on the system.

Results

The results of the snow gun test showed an increase in snow volume of almost 45 percent! As shown by the graphs below, without Snomax, the gun averaged a height of 19.9 centimeters across the test grid. With Snomax, the same type of gun averaged a height of 28.6 centimeters across the test grid. This is an increase of over eight inches in depth! In volume, the snow pile made without Snomax was 3.98 m$^3$, and the snow pile made with Snomax was 5.72 m$^3$. That’s an increase of 43.7 percent in the volume of snow made by Snomax!

From these results, the snowmakers were able to disprove the claim that specific guns can’t benefit from the use of Snomax. In addition, they were able to see the significant increase in snow production with the use of the correct concentration rate of Snomax. After the results of this test, the snowmakers of this ski resort saw the 43 percent increase in snow with the same amount of water.