



SNOW FENCES

help manage blowing snow

By Michael Smith

Wyoming is probably a lot better known for blowing snow than the amount actually received.

Blowing snow can close every road in the state – sometimes every winter – and blowing snow also creates problems for rural households and live-stock producers. Yards and corrals fill with windblown snow because of the obstructions created by facilities, buildings, and trees. The impact of obstructions, however, creates opportunities to determine where snow is deposited so it is not in the way and may be useful.

The right kind and placement of structures are key to managing blowing snow, according to research conducted by the U.S. Forest Service (USFS) and Wyoming Department of Transportation (WYDOT).

The height of residual vegetation on the area contributing the snow can limit the amount that will blow. Vegetation creates surface roughness, which slows surface wind speed. Shrubs and taller grasses catch

snow. Limiting grazing to leave residual vegetation or leaving stubble on mown or usually plowed fields is also effective until snow depth increases. Deliberate planting of taller growing grasses will add to the soil moisture by trapping snow. For example, crested wheat-grass planted in strips in a low-statured sagebrush rangeland doubled snow accumulation.

Tree shelter belts and snow fences are probably the most common snow management structures. Solid-walled wind shelters that both protect from winds and limit snow

accumulation within their walls are also becoming more common, according to the USFS/WYDOT research.

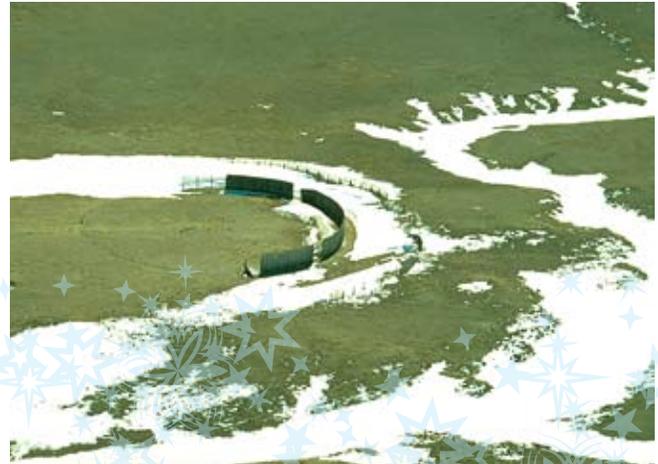
Designing an effective snow management system involves identifying the area to be protected, the amount of snow that must be controlled, and the height, length, location, and construction method of the structure.

Snow fences and shelter belts are placed upwind in the direction of the prevailing wind from the area to be protected. The height of the fence is determined by the size of area





A V-shaped shelter belt dramatically keeps the area free of snow.



This shows the flow of wind and deposit of snow when using a U-shaped shelter.

and snow depth on the contributing area. Length is determined by width of the area to be protected. Construction of typical highway snow fences is 1-by-6-inch horizontal wooden boards spaced 6 inches apart 14 feet high. This design catches the maximum amount of snow. Smaller contributing areas would call for a shorter fence. WYDOT is experimenting with other longer lasting construction materials.

Tree and shrub shelter belts are placed and the species selected using much the same criteria. Natural precipitation or irrigation water must be available to support the tree and shrub species. This can be a limitation in much of the Wyoming landscape.

A design flaw of many shelter belts and snow fences is that they are placed too close to the place intended to be snow-free. A snow fence that piles snow on the road or in a gate is counterproductive.

The length of the drift downwind behind a snow fence can be as great as 35 times the height of the fence.

Wind/snow shelters constructed with solid walls in a semicircle or V shape with the open side down wind (see photographs) can be very effective for protecting livestock from snow and wind. Nutritional requirements for animals decrease as the stress of heat loss due to cold wind is decreased, recovering the construction cost in high wind areas. The open side (D) should be less than 15 times the height (H). The protected area (60-80 percent wind reduction) will include the area inside the wings of the structure plus a downwind rectangle sized 0.85 times D by 5 times H.

Besides protecting roads, structures or livestock, snow fences have been effectively used to augment water supplies. Where soil permeability minimizes

percolation of moisture into the soil, the water captured in the drift behind a snow fence can be used to supply reservoirs or streams. On a reservoir, the snow fence should be placed upwind close enough a drift forms over the pit. The berm for the pit should be placed downwind at about the tail of the drift.

Snow fences properly placed along streams can effectively trap more snow than the vegetation and natural topography, with subsequent increases in the water delivered to the stream.

More information on snow management, including shelter belt design, is available from local conservation district offices and the Natural Resources Conservation Service (NRCS). Contact information for conservation districts is at www.conservewy.com/wacd/districts/index.html. Contact information for Wyoming offices of the NRCS is at www.wy.nrcs.usda.gov/contact/index.html.

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