The Snowman Says:

Tame Blizzards *With* Proper Windbreaks

BY TROY SMITH

PHOTO COURTESY BOB JAIRELL

In northern climates winter is a season made fierce by piercing wind and drifting snow. In the absence of natural protection afforded by trees or the lay of the land, producers often construct windbreaks to shield cattle from winds that make cold temperatures seem even colder.

A popular rule of thumb estimates daily maintenance requirements for cows increase about 1% for each degree below zero (Fahrenheit), so the most tangible benefit to windbreaks is the reduction of feed required for animals to maintain body condition during the winter. However, if protection from drifting snow also is a goal, producers should be aware that most traditional windbreak structures are better for catching snowdrifts than preventing them.

Protection from drifts

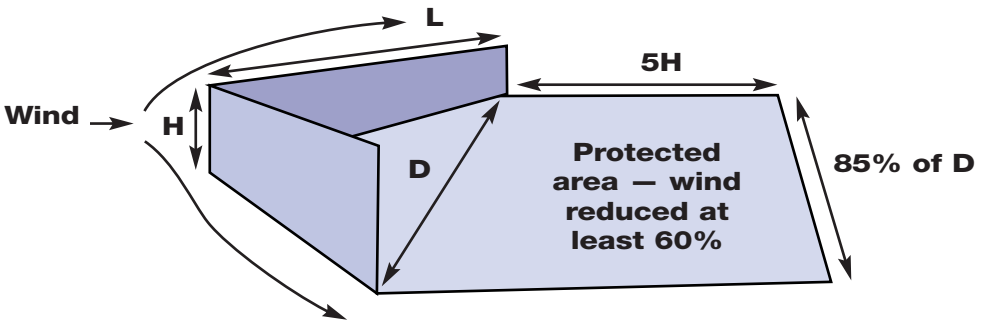
According to Bob "Snowman" Jairell, hydrologic technician for the U.S. Forest Service, common straight-line windbreaks aren't advisable in snow country. Jairell and his colleagues at the Rocky Mountain Forest and Range Experiment Station, Laramie, Wyo., specialize in taming blizzards by designing windscreens that reduce stress on livestock. Their studies show that V-shaped or semicircular shelters are most effective in deflecting both wind and snow.

"A straight-line shelter with solid sides will trap snow, first on the upwind side until it is full. Then it catches snow on the downwind side. Both the upwind and downwind drifts will be of equal size," warns Jairell. "A straight-line shelter with porous sides (gaps between the boards) will trap snow like a snow fence, with the downwind drift being larger. In either case, snow will be deposited in the protection area, and straight screens won't provide shelter from varying wind angles."

Jairell admits that porous barriers do create the greatest wind reduction, but windbreaks with solid surfaces will divert

CONTINUED ON PAGE 30

Above: Jairell suggests stacking bales two high, with each bale in the first row standing on end to keep the twine off the ground. Bales forming the second row are placed horizontally on top and will shed moisture.



Deflected snow will drift on either side of the windbreak but will leave the protected area clear. Protected area width will be approximately 85% of "D." To prevent drifting in protected area, distance "D" must be no greater than 15 × "H."

snow around the protected area. They will, at least, if the structures are built in the recommended semicircle or a "V" shape. With properly designed windbreaks, situated so they point toward the prevailing winter wind, producers can expect to maintain a drift-free protection area where wind speeds are reduced by at least 60%.

"Permanent shelters built from traditional materials generally are very cost-effective. Of course, costs of building materials and feed will vary; but often, feed savings match the cost of a shelter in two to five years," Jairell says. "A semicircular shelter provides about 25% more protection area than a V-shaped shelter using the same amount of material. A lot of producers prefer the V-shape, though, thinking it's easier to construct. We also suggest that producers consider stacking hay bales in a V-shaped wedge for a cost-effective temporary shelter."

Regardless of the materials used, Jairell says producers need to remember that the relationship between the shelter's height and width is important. Assuming that a V-shaped windbreak is being built, the sides of the "V" should join at a 90° angle.

For optimum deflection of drifting snow, the distance between the shelter's sides (width, D) should be no more than 15 times its height. If this relationship is maintained, blowing snow will be deflected to each side of the shelter, leaving a drift-free protection area extending downwind a distance equal to approximately five times the shelter's height.

If width exceeds the recommended maximum distance, instead of being diverted around the ends of the windbreak, drifting snow will blow over the top of the barrier and collect in the protection area.

Hay protection

When using hay, such as large round bales, to build a windbreak, producers still need to point the "V" toward the prevailing wind. Jairell suggests stacking bales two high, with each bale in the first row standing on end to keep the twine off the ground. Bales forming the second row are placed horizontally on top and will shed moisture. The result is a solid-sided shelter consisting of two walls, 10-12 feet high, coming together at a 90° angle.

When care is taken to maintain an acceptable relationship between height and width, so wind channels snow along the sides and away from the protected area, producers will find their hay often is more accessible. While traditional bale yards may drift full of snow, this stacking configuration won't collect enough snow to prevent access to the hay. However, the hay shelter must be fenced to keep cattle from eating the shelter before the worst of winter is past.

Not only is snowdrift prevention much less expensive than snow removal, it's usually much more convenient.

When blizzards strike during calving or in other situations where portable animal shelters might be useful, Jairell recommends making temporary windscreens fashioned from steel corral panels and plastic tarps. Two standard panels can be attached together, forming a 90° angle. This V-shaped frame is then covered with a tarp, or plywood sheets could be attached to form a solid surface. Steel posts or stakes to anchor the ends of each panel may be advisable when wind direction is variable.

"Even with these small shelters, 60% to 80% wind reduction can be achieved within 25 feet downwind of the point of the barrier," notes Jairell. "However, there can be as much as 40% wind reduction extending more than 50 feet."

Catching snow where you want it

There are times when producers may want to catch snow in certain areas to prevent drifting in others. Shelterbelts and snow fences can be effective in preventing snow deposition in stackyards, corrals and roadways if they are properly placed. And not only is snowdrift prevention much less expensive than snow removal, it's usually much more convenient.

Snow fences work best when placed perpendicular to the wind, and porous fences are best for trapping snow. Jairell recommends 50% porosity over the total height. Clearance equal to 10%-15% of total fence height should be provided between the bottom of the fence and the ground. Whenever possible snow fences should be continuous, without gaps or large openings.

Snow fences should be of sufficient length to intercept snow carried on winds varying 25° on either side of the prevailing wind direction. Generally, the required length of snow fence equals the sum of the protected area's width plus the distance between the snow fence and the downwind end of the protection area.

Jairell says fences should not be placed closer to the protection area than a distance equal to 30 times the fence's height. A 6-foot-tall fence protecting a driveway, for example, should be at least 180 feet upwind of the driveway.

"There are things producers can do to prevent problems from snow," offers Jairell, "but if you do them wrong, your problems just get worse." AJ