

Cold Comfort

Considerations for effective windbreaks.

by *Heather Smith Thomas*

Windbreaks pay for themselves in climates where wind chill can negatively impact cattle. The difference adds up — between reduced feed costs, decreased rates of illness and health costs, and less loss of body condition.

Natural windbreaks

Karl Hoppe, Ph.D., Extension livestock specialist at the North Dakota State University Carrington Research Extension Center, has been involved with cow-calf and feedlot management and nutrition for 34 years.

“North Dakota is a prairie state, and we get a lot of wind. If we want natural windbreaks, we must grow them. Soil conservation districts help people plant conservation-grade windbreaks, like seven to 15 rows of trees, and this will take about 20 years,” Hoppe says. “You need to plan for trees, but if you have that kind of windbreak, you also need to do regular maintenance. There are always a few limbs that blow down or trees that die and need to be removed.”

Joseph Darrington, Ph.D., former South Dakota State University agricultural engineer, says one problem with trees is they don’t have much foliage in winter to stop the wind.

“If you plant a shelterbelt, you need a couple rows of tall trees and a couple rows of smaller trees,” Darrington says. “In the fall, there may be enough understory of brush during early storms, but if you want more protection during winter and spring, you need some evergreens because the other trees lose their leaves.” And avoid ponderosa pine — if pregnant cattle eat those pine needles they may abort.

Hoppe says trees are great for slowing down wind but also work well for catching snow.

“If snow is drifting, trees slow down the snow and keep snow out of cattle pens next to them. This can greatly reduce the snow load in your pens.”

There is a downside, though.

“If you have windbreaks all the way around your farm barnyard and pens, in summer on a hot day when you need a breeze, it can get too hot for livestock,” Hoppe says. “Here in North Dakota, we usually only put windbreaks on the north and west side — and don’t do the south side. Unfortunately, there can sometimes be a cold, wet southern breeze, and then, the cattle have no protection.”

Making your own windbreaks

Deciding where to put windbreaks can be a challenge. In some cases, you might create portable or temporary windbreaks, such as using big straw bales or tarps fastened to fences.

“Permanent windbreaks made out of wood have been used for many years, but now most people are making them with metal — placing metal strips vertically or horizontally,” Hoppe says. “These last a long time but can also be bent and damaged if cattle rub on them or machinery hits them. Cost-wise, it’s about a tossup between wood and steel unless you are in a location where you can get cheap slab lumber.

“When you build windbreaks, permanent or portable, a rule of thumb is that each one-foot vertical provides 10 feet of downwind protection. If you have an 8-foot-tall windbreak, it will reduce wind speed for about 80 feet in a triangular shape, diminishing as you get farther out. When you plan for space, think about how much space a cow needs

to lie down. If she needs about 3 feet by 8 feet that means 24 square feet, so you probably need at least 20 square feet per cow. If you have an 8-foot-tall windbreak, you need to determine how wide it should be for a group of cows.”

You also need about 20% porosity, with space between the boards. Porosity is the ratio of the open portion of the windbreak relative to its total volume.

“If you have 20%, that would be an inch of space between every 1-by-6-inch board, or bigger spaces between bigger boards,” Hoppe says. “Wind will come through those slots fast, but as soon as it gets about a foot away from the windbreak, the air pressure is gone, and it loses velocity. Beyond that is a large area where it’s calm. This works well, because the cold area right by the fence keeps cattle from rubbing on it; they are not up tight against it. A windbreak should go clear to the ground, so the wind won’t blow underneath it.”

Research also supports leaving spaces between the boards rather than have a solid barrier, according to Darrington.

“The target porosity, according to several studies, is from 20% open and 80% solid, down to 65% or 70% solid,” he says. “If you have more than 35% porosity (and 65% solid) or closer to 50-50, you lose some benefits of the windbreak; you’ll have more air velocity coming through rather than being pushed up and over.”

A solid windbreak reduces windspeed next to the windbreak, dumping snow behind it. This reduces the protected area for cattle to bed or stand. With a porous windbreak, you don’t end up with a big snowdrift behind it.

“With 30% open and 70% solid, the protected zone behind the windbreak will extend 10 to 15 and sometimes up to 20 times the height of the windbreak,” Darrington says. “A 10-foot-tall fence slows the wind for about 100 to 150 feet behind it. If it’s a straight windbreak and the wind is coming head on, perpendicular to it, this creates a triangular protected zone behind it.”

Some producers make windbreaks using vertical metal roofing.

“A 30-inch piece of roofing metal gives enough space for calves to nestle against it and be protected,” Darrington says. “You need a bigger gap, however, to create adequate porosity, so snow won’t collect right behind it.”

For cows, some people feel these types of windbreaks are a little less effective because air speeds through the larger cracks so quickly that if cattle are right next to it, they may still get cold.

“But once you get one or two heights’ distance away from the windbreak, there is decreased velocity of air. Calves, however, can be very snug next to those 30-inch sections so you might get the benefits of both (solid windbreak plus some porosity),” Darrington says. “These are also fast and easy to build, with fewer total

pieces to put vertically. The spacing, if it’s a 30-inch piece of roofing metal, would be 5- or 6-inch gaps between them, or about 36 inches on center.”

Know the reason for a windbreak

Hoppe says you also need to think about the purpose of the windbreak — whether to catch snow or provide shelter for cattle — and plan accordingly.

“Here on my own farm, I have a windbreak to slow down the wind for cattle and another one to catch snow as well as slow down the wind,” Hoppe says. “This is why a person might have trees and then another windbreak behind the trees. A tree windbreak catches the snow before it gets to the cattle pens and a windbreak beyond it provides wind relief for the cattle.

“When I don’t have trees where I need them, I stack hay bales to stop the snow, and then the windbreak that’s made out of wood doesn’t collect snow. The only problem is when the wind changes and comes from a different direction.”

Portable windbreaks are also useful in certain situations. They can be moved when the cattle are moved, doing rotational grazing on winter pasture.

“Even in a pen, if you do it right, cattle can use all sides of a portable windbreak. Most of our windbreaks

are around the perimeter, but if you have portable windbreak panels, you can put those in the middle of the pen,” Hoppe says. “If you have a south wind the cattle will stay on the north side of the panel, and if you have a north wind they will stay on the south side. If you have a V shape, they have four sides to get behind.

“That way the cattle are protected no matter which way the wind is blowing, and if you don’t like where you have a windbreak, you can pick it up with a tractor and move it to a different location. They do freeze down, and wind can also flip them over if you don’t have them well counterbalanced or staked down securely.”

There are many options for windbreaks and a person can usually come up with something that works and fits their own operation. Preventing wind chill is key, especially if cattle are wet from rain or a winter storm with wet snow. If their hair gets wet and moisture gets clear down to the skin, they lose their natural insulation.

“Cattle can stay warm as long as the wind isn’t blowing through their hair, or they get wet. Nothing is worse than 34 degrees with rain on newborn calves,” Hoppe says. “They chill immediately. Snow is better than a cold rain.” **BA**



Photo courtesy of Heather Smith Thomas