



Water Quality Enhancement Activity – WQL23 – Protection of sensitive areas on winter grazing land

This enhancement is for the protection of riparian and other identified sensitive areas that are susceptible to degradation when used for wind protection by livestock.

State Criteria

1. Producers are required to use one type of alternative shelter to provide livestock with protection from wind.
2. Alternative shelter design criteria and placement must follow state Land Grant University guidelines or NRCS design criteria.
3. Fabricated shelter designs will meet the need of the entire herd.
4. Supplemental feeding or salt and mineral supplements will not be permitted within ¼ mile (1,320 ft) of riparian areas, water courses or water bodies.
5. Alternate livestock watering sources should be provided outside of the riparian/sensitive area, and be feasible and practicable for ready use by livestock. The producer should consider the source of alternate livestock watering sources, outside the riparian/sensitive area, in relation to the planned location of the fabricated wind shelter.

Documentation Requirements

1. A map showing the planned location(s) of fabricated shelter(s) in each pasture, and delineated riparian/sensitive area(s).
2. An approved fabricated shelter design.
3. Photographs showing shelters in the field.
4. Complete the following table.
5. Photographs of livestock unoccupied riparian/sensitive area following winter season.

In addition, complete the Table below:

1	2	3	4	5	6
Tract	Field	Planned Acres (Sensitive Area)	Applied Acres (Sensitive Area)	Applied Location of fabricated shelter	Applied fabricated shelter design
Ex. T1001	1	10	10	T1001 Field 1	NRCS design (see specs.)

NRCS completes column 1, 2 & 3 (Tract, Field and Acres Planned, etc). Operator completes remaining columns.



Alternative shelter to provide livestock with protection from wind

Structures. All structures shall be designed according to appropriate NRCS standards and specifications or NEH recommendations.

General Criteria for Livestock Fabricated Shelters for Winter Grazing

Fabricated shelters shall be located in areas where livestock protection is desired during typical storms. The site should be accessible by vehicle.

Locate the fabricated windbreak on uplands away from riparian areas and concentrated flow areas so any waste concentration will no longer impair water quality.

The shelter should be located on level, uninterrupted terrain, if possible, due to the complications on wind flow caused by hilly terrain. If the shelter must be located downwind of a hill, then place the shelter as far downwind as possible. Shelters upwind of a hill shall be placed a minimum of 75 times shelter height upwind of the base of the hill.

Shelters must be constructed with a solid face to divert drifting snow around ends of the barrier.

Shelters shall be 90° “V” shaped or semicircular shaped, for optimum protection from wind and drifting snow. Wind speed reduction of 60-80 percent is possible in the protected area extending 5H downwind of the barrier (Figure A). The V, or closed end, should point in the direction of winter and early spring prevailing winds. The shelters cause the snow to be diverted around the shelter and deposited in drifts extending five times the shelter width (D) downwind.

Shelter width (D) as measured across the opening between the two end posts of the shelter must be 15H or less. A minimum length is needed to protect from eddy currents (whirlwinds) at shelter ends, however if the shelter is too long, drifting snow is forced up, over the shelter into the protected area rather than being diverted around it. Generally, the length of each wing of the shelter should be 7-10 times the shelter height.

Design the shelter following Tables 1 and 2.

Table 1. Minimum Protected Area Needed

	Yearling Cattle	Beef Cows	Sheep
Ft ² /animal	35	50	10-15

Table 2. Protected Area at Maximum Wing Length (See Figure A)

Barrier Height, Ft.	Wing L, Ft.	Width D., Ft.	Protected area, ft ²
6	60	84.8	3,964
8	80	113.1	7,047
10	105	148.5	11,823
12	125	176.8	16,828
14	145	205.1	22,714

Semi-circular shaped shelters can be built with approximately the same quantity of materials as the “V” design. The ratio of protected area to shelter length is also about 27 percent higher than the “V” shape. Dimensions for the semi-circular shaped barriers should be based on a radius equal to one-half D for the “V” shaped barriers as shown in Table 2. Semicircular shelters are generally the most economical (material cost per protected square foot); however, the type of material used for board or panels can be a limiting factor due to the shape. The semi-circular shape also tends to be self-bracing.

General Structural Criteria for Fabricated Windbreaks

Panel covering shall be minimum nominal 1- inch lumber, 28-gage coated corrugated steel, or similar durability material. Boards or panels should be attached to the windward side of the shelter. Provide rub rails or other features as needed to protect the structure from animal damage.

Wood installed within eight inches of the ground must be pressure treated (or equal). Where a fabricated shelter is to be constructed of wood, the structure may be designed by an engineer, or sizes and spacing shown in Table 3 may be used.

Table 3. Post Spacing for Fabricated Windbreaks
(Minimum 6" Tops)

Barrier Height, Feet	Pole Length, Feet	Min. Depth, Feet	Pole Spacing, Feet	Girt Number & size
6	8	3.5	10	3, 2x8
8	10	3.5	10	4, 2x8
10	12	4	8	5, 2x6
12	14	4	6	6, 2x4

Stock Water. Proceedings, The Range Beef Cow Symposium XII, Dec. 3-5, 1991, Fort Collins, CO, 11 pages.

Johnson, D. Windbreak/shelter Fences. 1975. Great Plains Beef Cattle Feeding Handbook, GPE-5200. P. 5200. 1-4.

Jones, D. D. and W. H. Friday. Wind and Snow Control for the Farmstead. Emergency Management in Agriculture AE-102, Purdue University Cooperative Extension Service. 11 pages.

Meiman, P. 1993. Cost Analysis of Wind Protection Structures for Range Beef Cattle. Range Livestock Problem, University of Wyoming RGMG 4540-03. 15 pages.

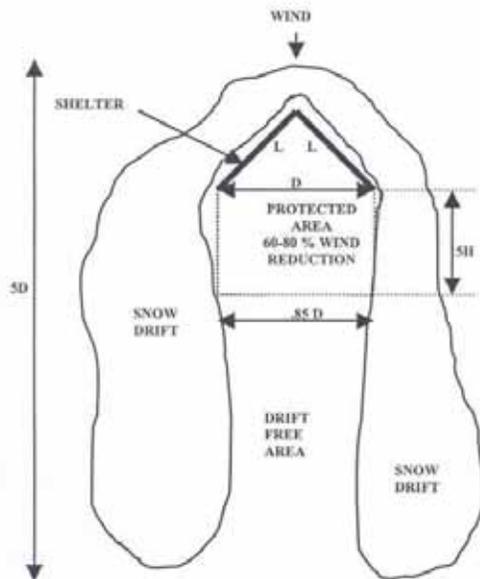


Figure A. Snowdrift Protection (Plan View)

REFERENCES

South Dakota (SD) NRCS conservation practice standard Heavy Use Area Protection (561), SDTG Notice 256, Section IV, NRCS-July 2007

Jairell, R. L. and R. A. Schmidt. 1991. Taming Blizzards for Animal Protection, Drift Control, and