Conservation Practices that Save: Windbreaks/Shelterbelts

For homeowners in rural areas, well-designed windbreaks can cut home heating costs by 10 to 25 percent. Up to one-third of the heat loss from a building is caused by air leakage through cracks and other openings. High winds can force cold air through cracks around poorly fitting windows or frequently opened doors, aggravating the heat loss from unprotected buildings. Windbreaks reduce the force of the wind on the exterior surfaces of buildings and thus the amount of cold air that enters the home.

About 11 percent of the America's energy use goes to heating and cooling of residential homes. Nearly two-thirds of residential energy use is for heating (53 percent) and cooling (12 percent). Individual savings depend on local site and climatic conditions, the building's construction quality, an individual's living habits, and the design and condition of the windbreak.

Windbreaks or shelterbelts are barriers used to reduce wind speed and usually consist of trees, shrubs, or a combination. For the greatest protection, the windbreak needs to be oriented perpendicular to the troublesome winds. The reduction in wind speed behind a windbreak modifies the environmental conditions in this sheltered zone. The sheltered zone extends as far as ten to fifteen times the height of the windbreak downwind from the windbreak. The greatest wind reduction occurs between two to five times the height of the windbreak downwind. For maximum wind protection, the windbreak needs to be dense and tall.

A windbreak saves energy and adds comfort and livability to homes in open country.

A resident of Ft. Collins, Colorado, built a home on rural acreage in 1970 and planted a windbreak for protection at the same time. For the next 20 years, he recorded the amount of natural gas used to heat the home. As the windbreak matured, he observed a decrease in gas use with an estimated 40 percent savings overall in the 20-year period.

Home heating savings are not the only energy benefit from windbreaks. Windbreaks are very effective in controlling drifting snow. By strategically locating windbreaks upwind of roads and highways, blowing snow can be reduced, resulting in less snow accumulation and ice development on roads. This results in less fuel being used to remove snow from highways. This windbreak application is also known as a living snow fence. In a State like Minnesota, where the State spends an average of $100 million per year in snow removal, this can be a significant savings. Minnesota performed a cost-benefit analysis of living

snow fences and found that for every dollar spent on a living snow fence, there was a $17 return. This included not only the savings in fuel but also less economic disruption resulting from closed roads. The living snow fences also can save lives by improving driving conditions during the winter.

Agriculture Canada conducted a 2-year study comparing heating costs in a well sheltered farmyard with those of a completely unsheltered one. The study, conducted during the winters of 1981-82 and 1982-83 near Indian Head, Saskatchewan, used two identical, electrically heated trailers kept at 72 degrees F. The study found that the sheltered trailer used 27 percent less electricity.

Windbreaks also:

- Protect livestock – increase feed efficiency, increase weight gains, increase survival of newborns, improve animal health, and ultimately increase profits;
- Reduce wind erosion;
- Increase crop yields by 5 to 20 percent, and increase crop quality;
- Reduce pesticide drift;
- Improve irrigation efficiency;
- Filter dust and other air pollutants;
- Provide wildlife travel corridors and habitat;
- Store carbon; and
- Reduce noise.

NRCS supports conservation practices that save producers money and improve the environmental health of the Nation. For more information on energy-saving conservation practices, visit the NRCS "Save ENERGY, Save MONEY" Web site at www.nrcs.usda.gov.

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November 2006