

## Bunker Silo Cover Alternatives

by Brian Holmes

### Introduction

Silage is covered for two primary reasons. First, covered silage reduces exposure to oxygen. Oxygen is required for the growth of aerobic organisms. These aerobic organisms cause the decomposition of valuable feed. A second reason for covering silage is to exclude rainfall. Precipitation washes organic acids and other soluble feed components from the forage. Organic acids keep silage pH low resulting in an environment that prevents growth of silage-decomposing organisms. In addition, precipitation introduces oxygen to the feed. Seepage caused by either high-moisture forage or precipitation carries away valuable feed nutrients and increases the risk of surface and groundwater contamination. Bunker silo covers should be selected based on their ability to exclude both air and precipitation.

### What is the best material for covering a bunker silo?

Research and on-farm experience has shown 6-8 mil thick polyethylene plastic containing ultraviolet light protection works well to exclude air and precipitation. Precipitation runoff from the bunker silo cover should be diverted without passing through the silage (often a problem at the bunker walls). Plastic should be held in contact with the silage to keep air from moving under the plastic and coming into contact with the forage. This is often done with waste tires or tire sidewalls. The tires should touch each other to obtain good, uniform weighting. Soil or sandbags are often used to seal the plastic edges.

A new oxygen barrier system has been introduced recently. It uses a thin plastic sheet which has much lower oxygen permeability than polyethylene. A second layer of plastic or a tarp is used on top to protect the thin plastic layer. A weighting material

Brian Holmes, Extension Specialist  
Biological Systems Engineering Department  
UW-Madison  
Madison WI 53706-1561  
bjholmes@facstaff.wisc.edu

(tires, sand bags, rock filled bags etc.) hold the layers in place. This new system has proven to be better than 8 mil plastic for reducing dry matter loss at the top of the silage.

### What bunker cover alternatives provide protection for silage?

A variety of materials has been used on farms as an alternative to plastic covers. Some of these materials have been researched to study their effectiveness at preventing silage from spoiling. Producers often judge effectiveness by the depth of the spoilage layer (blackened forage) and the convenience of using an alternative cover. Extreme caution should be used when considering other producer's claims of alternative cover performance. Most producers don't understand that one inch of black forage may have been 2-3 inches of green, high quality feed when placed into storage. This represents a 50-65% loss of dry matter. They also don't understand there is a transition zone (1-2 feet) of brown-gray forage below the black layer where a substantial amount (20-30%) of dry matter loss occurs.

Research has shown that covering silage with **ground limestone** or **soil** may provide some silage protection compared to no cover at all. However, unless a cover excludes air and water, it does not compare very well to plastic covers.

Research has also shown that covering silage with **molasses**, "**nutri-shield**", **sawdust**, **sod**, or a **roof only** does not protect against spoilage loss any better than if the silage remains uncovered.

### Are there any spray-on products that can provide good silage protection?

This is the "Holy Grail" of silage covers. The concept would allow minimal effort and still provide forage protection. Several products have been developed and tested, but to date nothing has emerged as a successful commercially available product.

© University of Wisconsin Board of Regents, 2006