By Keith Bolsen

ASK YOUR SILAGE ADVISORS

IS YOUR SILAGE PLASTIC CONTRIBUTING TO SILAGE LOSSES?

Silage plastic plays a critical role in preventing oxygen from getting into silage. Keeping oxygen out decreases costly dry matter losses and protects silage nutrients. Your goal is to prevent as much oxygen from seeping into silage as possible during the entire storage and feed out periods. Start by asking the right questions when purchasing silage plastic.

Up to 20% of U.S. forages never make it from the bunker silo or drive-over pile to the feed bunk. Poorly covered silage is a major culprit in these losses.

According to the National Agricultural Statistics Service, the U.S. produced 117.85 million tons of corn silage and 18.45 million tons of alfalfa haylage in 2013. But 16-20% of these forages will never make it from the bunker silo or drive-over pile to the feed bunk. That's $1.4-1.8 billion of feed inventory out the window. Poorly covered silage is a major culprit in these losses.

By simply doing a better job of protecting the surface of bunkers and piles, it's possible to reduce the loss of feed inventory by $200-450 million every year. Choosing the right plastic and achieving a proper seal are key to making this happen. Here are some questions to ask when selecting silage plastic.

1) Why is oxygen transmission rate important when choosing silage plastic?

The measurement used to determine how effective plastics are at keeping oxygen out is called oxygen transmission rate (OTR). Laboratory test results, using the American Standard Test Method (ASTM), show that silage plastics have a wide range in OTR, from about 6,000 cubic centimeters to less than 30 cubic centimeters of oxygen per square meter in 24 hours in a 100% oxygen environment. The lower the number, the less oxygen gets through the plastic and the better the protection is.

It's not just a matter of doubling the layers of plastic to prevent oxygen from getting through. A true oxygen barrier film with a 1.8-mil thickness has an OTR of 29 compared to an OTR of 1,811 for standard white-on-black silage plastic with a 5-mil thickness. For comparison's sake, it takes 60 sheets of regular plastic to equal the protection provided by one sheet of oxygen barrier film.

Silage plastics are not created equal in terms of the protection they offer. Before purchasing a product, ask what the OTR is and ask to see independent lab test results.

2) How does oxygen barrier film work?

Oxygen barrier film stops more oxygen from passing through the protective plastic covering, which initially minimizes aerobic respiration, and then continues to prevent aerobic spoilage throughout the storage and feed out periods.

In addition, oxygen barrier film achieves a proper seal by following the contours of the surface, clinging to the forage, and filling in the gaps. This helps eliminate visible surface spoilage. In contrast, standard plastic will trap oxygen underneath, which leads to surface-spoiled silage.

Bunkers and piles should be sealed immediately after filling is complete, and the most effective way is to use a two-layer system. The first layer, an oxygen barrier film, prevents oxygen penetration, while the second layer, a standard plastic, protects the oxygen barrier film from damaging ultraviolet light. How quickly after filling is complete are you covering? Are you utilizing a two-layer system?

3) How much does oxygen barrier film reduce dry matter loss in bunkers and piles?

University research and field trial results show that an oxygen barrier film reduces dry matter (DM) loss in the original outer 1 to 3 feet of silage or haylage by 40-50% compared to standard white-on-black plastic. A recently published meta-analysis, which included 41 trials, found that DM and organic matter losses in the original top 0.4 to 2 feet of bunker silos and drive-over piles were, on average, 19.5% for standard plastic and 11.4% for oxygen barrier film.

Sealing with an oxygen barrier film can

reduce the total DM loss by 2.5-5 percentage points alone, depending on the size of the bunker silo or drive-over pile.

Ask for independent research and field trial results before purchasing a silage plastic.

4) What is the economic benefit of sealing with an oxygen barrier film?

The economic benefit of sealing with an oxygen barrier film has been well documented. Here are two examples:

In a bunker silo of corn silage with a 3,000-ton capacity, which is 50 feet wide x 210 feet long, with a depth of 12 feet and above average density, sealing with oxygen barrier film would produce a net saving of $3,000-5,000 more silage compared to standard white-on-black 5-mil plastic.

In the case of a drive-over pile of corn silage with a 3,000-ton capacity, which is 90 feet wide at the base x 210 feet long, with an apex height of 14 feet and above average density, sealing with oxygen barrier film would produce a net saving of $4,500-9,000 more silage compared to standard white-on-black 5-mil plastic.

If producers also consider the financial impact of feeding surface-spoiled corn silage or alfalfa haylage to dairy cows and replacement heifers, there are even bigger savings to be gained by sealing with an oxygen barrier film.

Think safety first! It's simply too dangerous to pitch surface-spoiled silage off the top of most bunkers and piles today. When used properly, oxygen barrier film can eliminate the need to remove spoiled silage.

Calculate the profitability of reducing DM loss in the top 1.5 to 3 feet of your bunkers or silage piles.

Protecting the surface of your bunker or pile will help protect your investment in the time, labor and dollars put into your high quality forages. Choosing the right type of oxygen barrier film is one way to make sure your feed makes it from the pile to the feed bunk. Ask your silage advisors how you can protect your feed investment.

■ **Dr. Keith Bolsen** is a silage management expert and professor emeritus at ***Kansas State University***. Contact him via phone: (512) 301-2281 or e-mail: keithbolsen@hotmail.com.