Covering Bunker Silos with Plastic

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Silage Field Day

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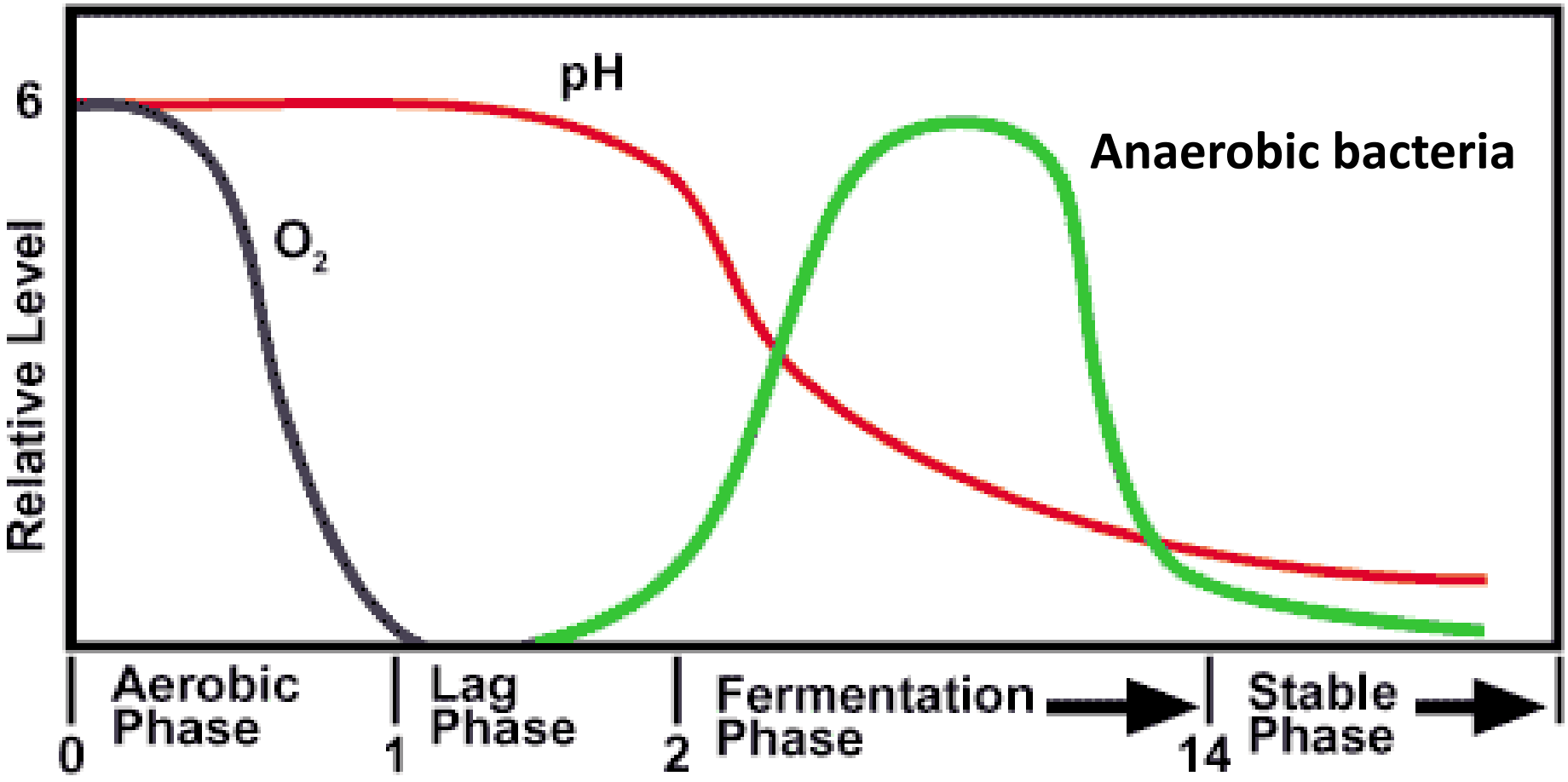
#1 Enemy of Silage is AIR

- **True from the beginning of fermentation to the opening and feeding of the silage**

- **Why?**
- **Bacteria that help change fresh forage into silage require an oxygen-free environment**
- **O_2 allows for growth of detrimental microbes; Yeasts can grow from 100 to 1 trillion in 3 days; Molds produce mycotoxins that hurt cow health**

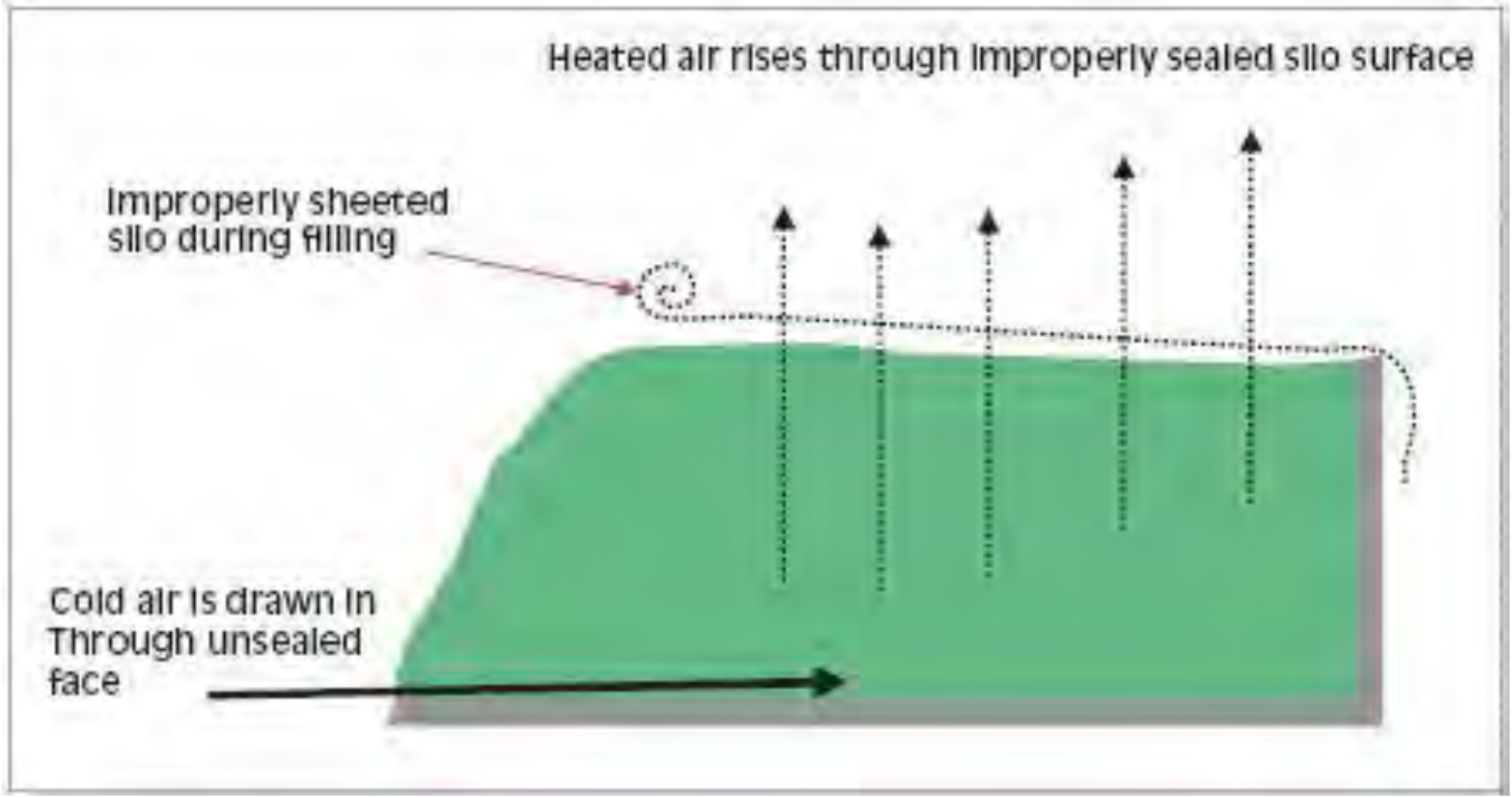
Shift From O_2 to No O_2 in 2 Days



“Flue Effect”

- **Heat is produced during aerobic respiration and bacterial fermentation**

- **A “Flue Effect” is created if silo is not properly covered resulting in continued entry of O_2 into the silage.**



Silage Preservation

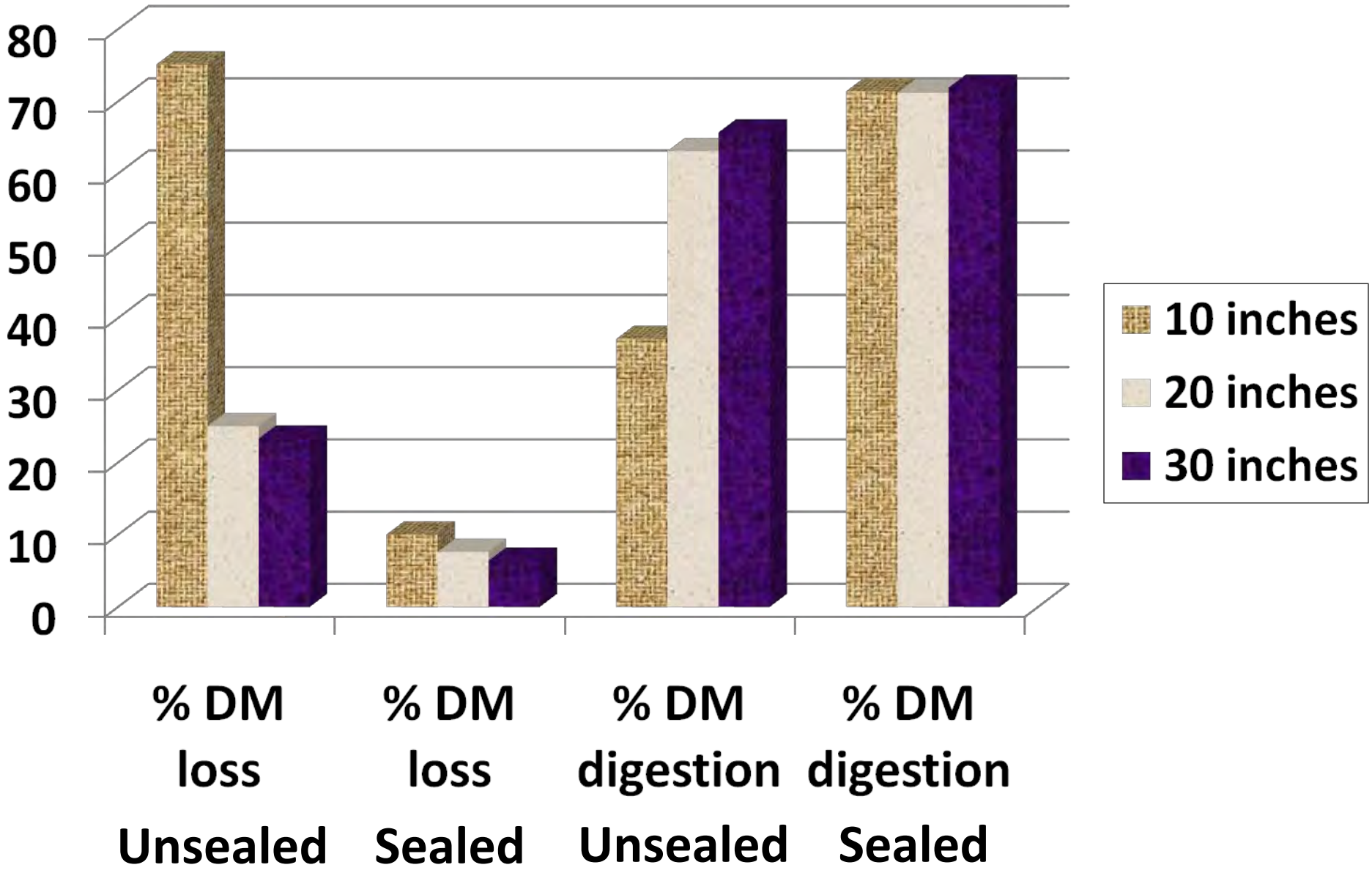
- **Farm manager survey of most important management practice for making silage:**
  - **Chopping**
  - **Use of additives**
  - **Filling**
  - **Packing**
  - **Sealing *** all managers ranked 1st or 2nd**
  - **Feedout**

- **Top 3 feet of silage is most susceptible to spoilage in bunker silos; ~25% of total silage**

Coverings for Ensiled Forage

- Lime
- Soil
- Roof
- Molasses
- Sod or sown crop like wheat
- Sawdust
- Straw
- Composted manure solids
- PLASTIC***

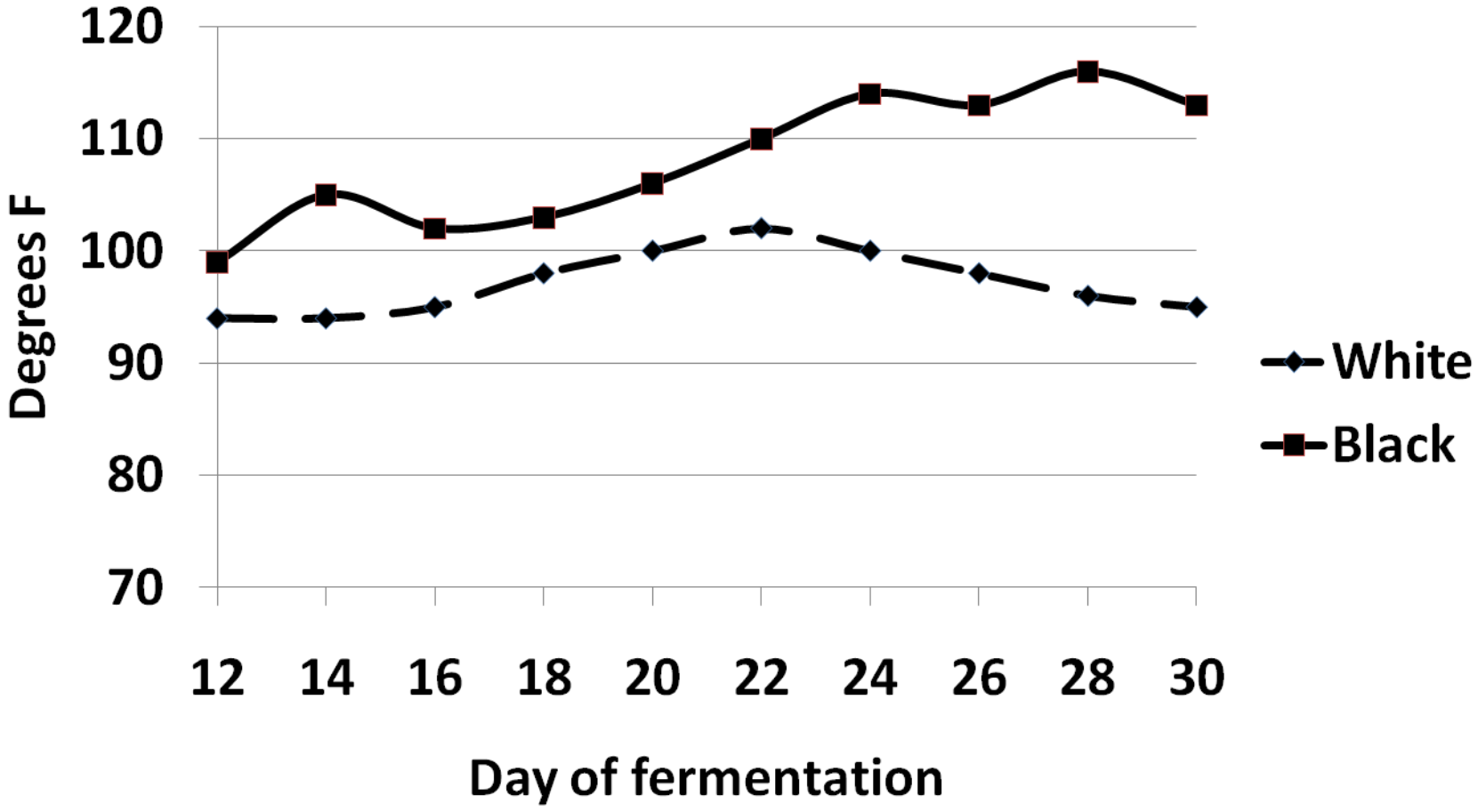
Effect of Sealing Bunker Silos on DM Loss & Digestion (Berger and Bolson, 2006)



Proper Plastic Sheeting

- 8 is better than 6 than 4 mil thickness
- Black on white with white on surface of silo
- UV protection
- 2 layers of plastic are better than 1 layer
- Oxygen barrier plastic (“Silostop”)
  - Very thin, 45 um
  - Not UV protected
  - Very effective
  - Requires additional cover due to fragility

Color of Plastic on Silage Temp



Sealing With Plastic Sheets

- Sealing the edges of bunker silos are the most challenging areas to seal and the most vulnerable to deterioration due to air.
- Packing along the side walls of silos is difficult and a tractor wheel can easily damage a sheet of plastic draped over a silo wall.
- Tucking a top sheet of plastic down the sides of a filled silo is impossible.
- To properly seal the silo shoulders, plastic sheets must be placed over the side walls before filling begins.

Plastic on side walls before filling to:

- **WHY?**

➢ **ensure quality silage at shoulders**

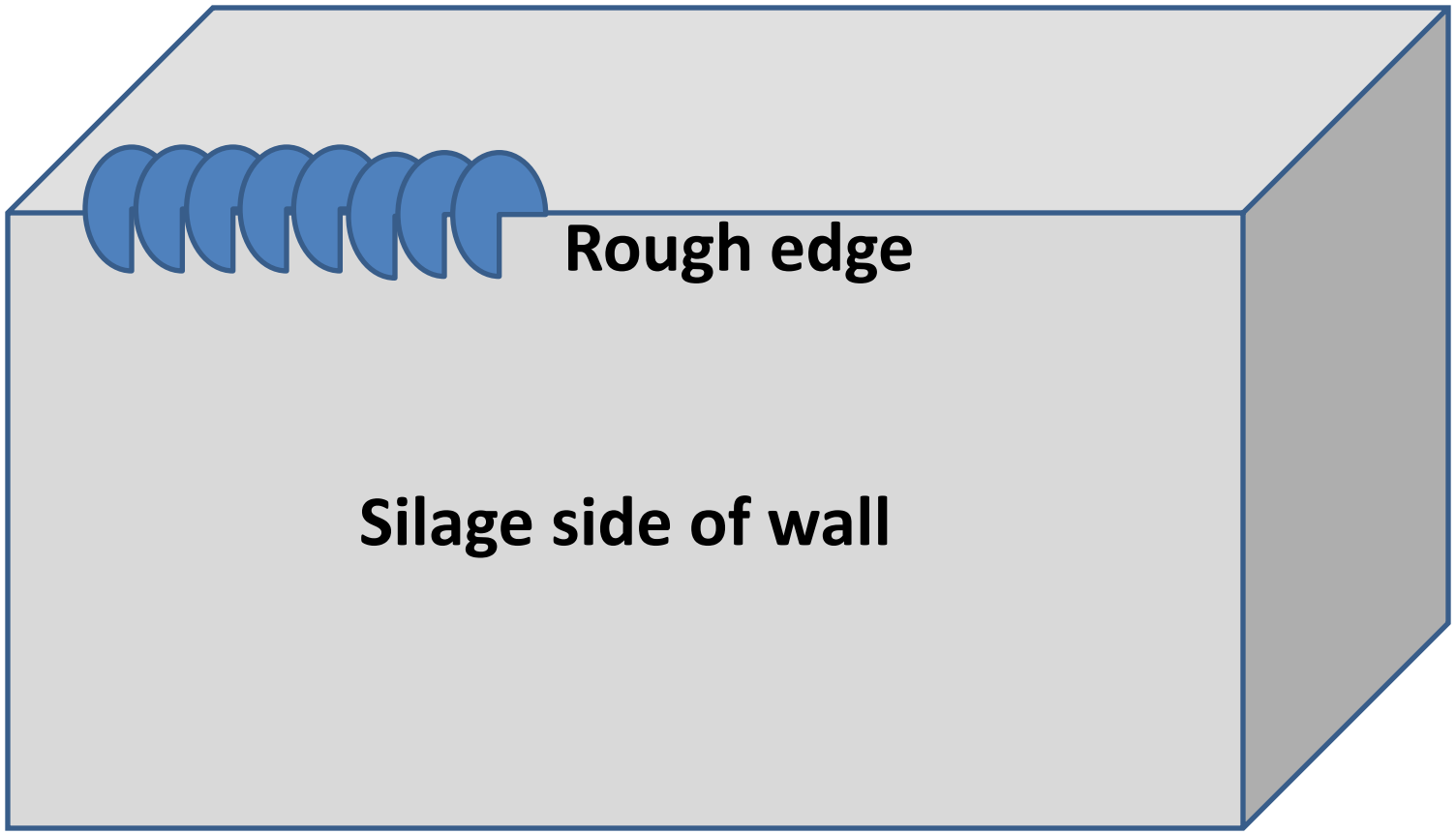
➢ **ensure a good seal between top sheet and side walls**

➢ **divert water run-off away from silage**

➢ **protect side walls from damage**

Key Steps of Lining Side Walls With Plastic

- **Prevent concrete wall from tearing plastic by putting carpet or half of plastic drain pipe along edge of wall.**



Key Steps of Lining Side Walls With Plastic

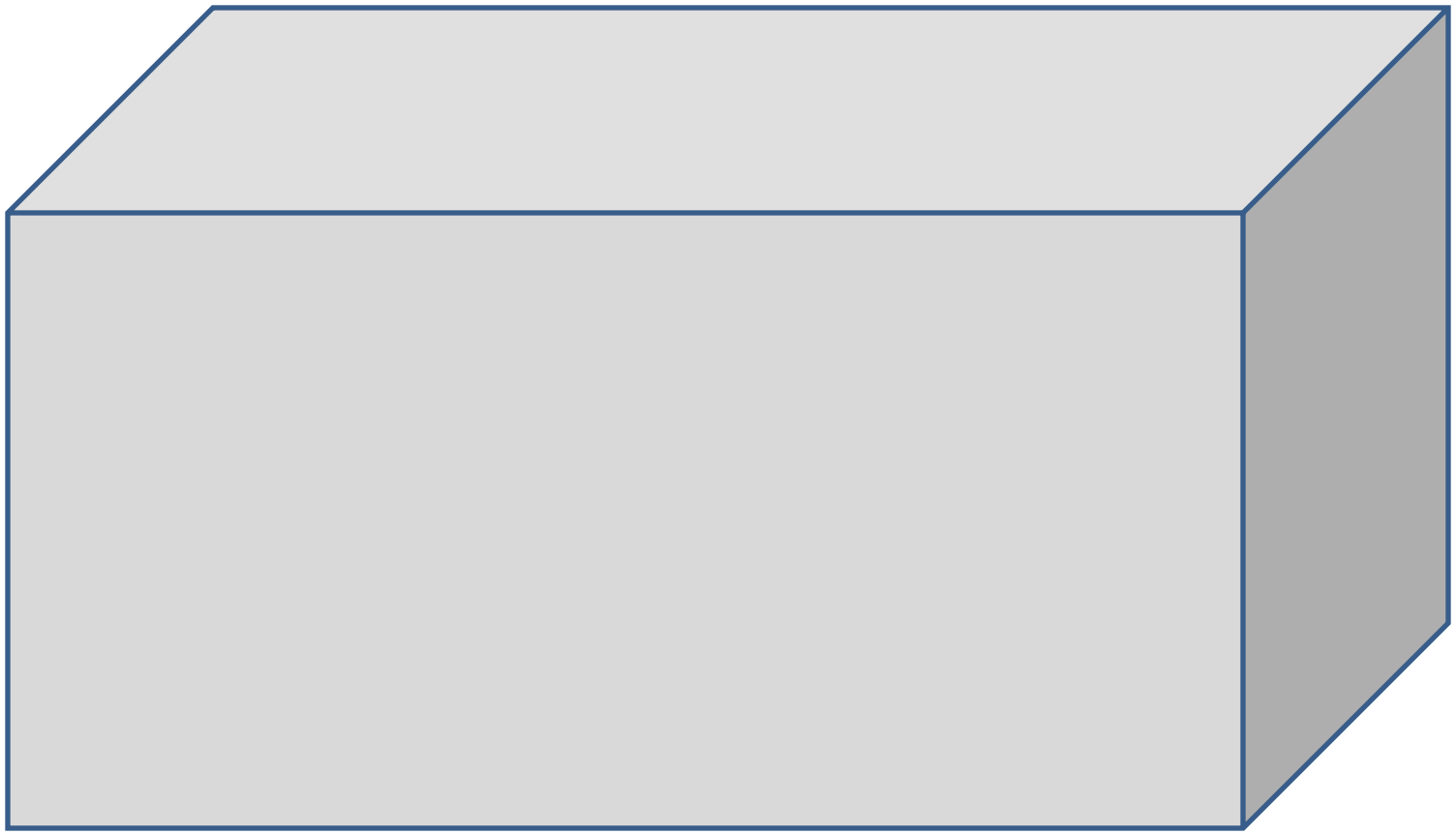
- **For our 12’ tall silo walls, we use sheets of 25’ wide by 100’ long**
- **Drap single layer of plastic over side walls with weight (gravel bags) on top of silo wall AND on opposite side of wall to hold plastic in place**
- **Overlap plastic sheets edges by 5 - 7 feet**

Key Steps of Lining Side Walls With Plastic

- **Plastic should extend onto bunker floor for about 2 to 3 feet from foot of wall**
- **Weigh down sheets on silo floor with chopped forage or bags**

Key Steps of Lining Side Walls With Plastic

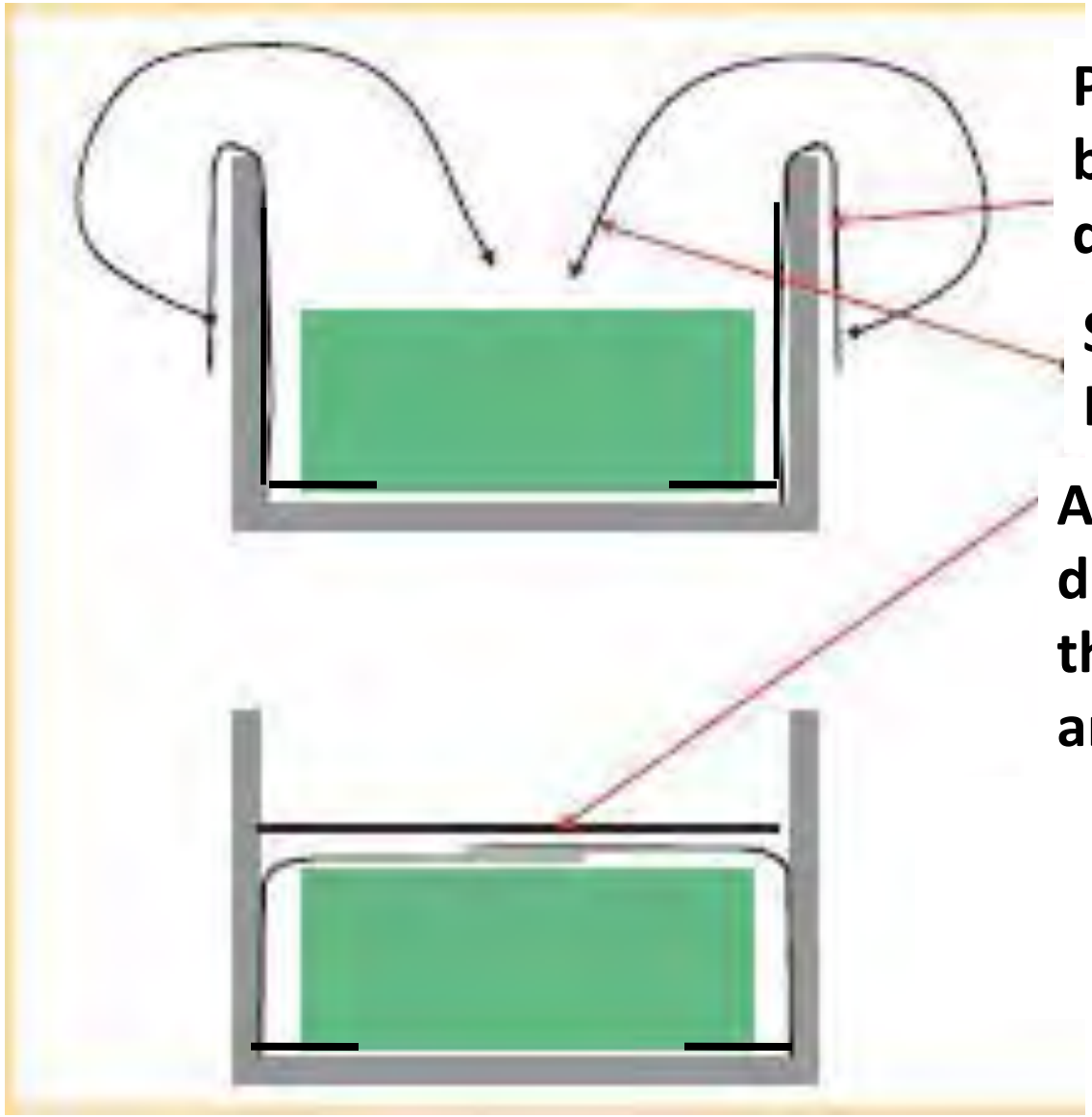
- Tape plastic to back edge of wall to prevent wind from dislodging plastic during filling



Tape plastic back here

Key Steps of Lining Side Walls With Plastic

- **After the silo is filled, pull the side wall plastic sheets that were drapped over the side towards the center of the pile.**
- **Then put down the top plastic sheet over the side sheets. This gives two layers of plastic on top.**



Plastic is laid down sides before filling begins and draped over sides

Silo is filled and plastic Is pulled to center

A final sheet of plastic draped over back wall is then pulled over the corn and sealed at the bottom

Modified from www.farmwest.com

Securing Plastic Seal to Silage

- **Hold plastic sheeting in place with sufficient weight to ensure good contact between the plastic and the silage.**
- **Tire sidewalls (20-25 lb); all touching**

www.napcomodern.com

Securing Plastic Seal to Silage

- **Sandbags filled with gravel which does not absorb water like sand**
- **Use gravel bags at seems and at edges of plastic including feeding face**
- **Straw or hay bales are of limited use because they can puncture the plastic.**
- **Repair rips and holes in plastic ASAP; inspect 2x weekly; use alcohol and special tape.**

Amount of plastic Needed to Cover Sides and Top of Bunker Silo

- **Bunker size: 40’wide by 200’ long**
- **4.5 rolls of 25’ by 100’ for sides**
- **2 rolls of 40’ by 100’ for top**

Costs of Covering Bunker Silos With Plastic Sheets and Tires

- **Plastic for sides: 4.5 rolls x $85/roll = 382.50**
- **Plastic for top: 2 rolls x $140/roll = $280.00**
- **18 man-hours of labor x $12/hour = $216.00**
- **Tires: $1100 (one-time cost)**
- **Total cost: ~$1000**

inputs	
Cost of the plastic sheets, tires, labor, $	$1000
Silage value, $/ton	$50/ton
Silage density, wet lbs/cubic foot	43
Silage lost in top 3 feet	
Unsealed, % of crop ensiled	50
Sealed, % of crop ensiled	15
Silage in the top 3 ft, wet tons	516
Value of silage lost if unsealed, $	$12,900
Value of silage lost if unsealed, $	$3,870
Value of silage saved by sealing, $	$8,030

Silo is 40’ wide by 200’ long; labor costs are $12/hour for 18 hours = $216.