

Get Maximum Mileage Feed Silage

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Introduction to Silaging

Silage pits, bunkers and silos are seen all over the peace river area. What is the advantages to putting up silage?

Silage has several advantages over hay as a mechanically harvested product. Silage has more nutrients preserved per acre because there is less field loss. Silage is also less affected by weather damage because the forage does not lie in the field drying. The ensiling process has become more mechanized and therefore could be considered less labor intensive than haymaking. More crops can be used for silage and silage is well suited as an ingredient in mixed rations for livestock.

However like every good news story there are some disadvantages to silaging. There can be extensive losses in storage if the silage is mismanaged. The storage facilities for silage are distinct and not as multi-purposeful as barns and some of equipment must be purchased especially for silaging so initial investment in equipment can be high. Hay is very transportable, silage is heavy and can be difficult to move from place to place.

The quality of silage feed is traditionally higher than the quality of hay, and silage can be kept from one year to the next with very little spoilage or degradation if sealed properly .

Is it Worth Wrapping?

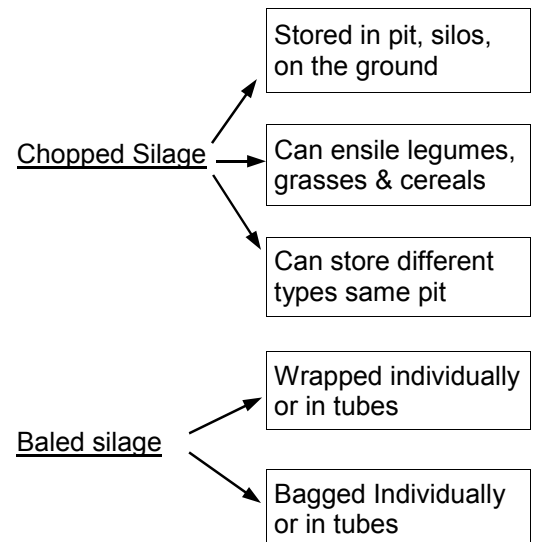
In dry outdoor hay storage the outside 25% of bale can be rotten by the end of the winter and quality of entire bale can decline over the winter.

By using a haylage system very little of the bale is spoiled, only where the plastic has been punctured and air has entered bale. Haylaging ensures quality of forage is maintained year round.

Silage & Haylage

Silage is cut, chopped and stored in silos, pits, or on the ground. There is also haylage, where the hay is baled at a higher moisture than dry hay and then wrapped or bagged.

The big difference between bagging and wrapping is that wrapping over laps at least 25% up to 50%, this provides 4 layers of plastic once wrapped, making it more airtight than a bag. In the bag system, there is only one layer of plastic, although it is thicker, once punctured air has access to the whole bale. In wrapping if plastic is punctured air can only access small portion of bale as next layer or strip is still wrapped on tightly.



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Silage Basics



Silage is made by packing plants in a storage container to exclude the air and allow fermentation to develop beneficial organic acids, which preserve the moist feed. Storage may be in upright tower silos or in trenches in the ground.

Best quality silage results when the forage is ensiled with a moisture content of 50 to 65 percent. Lower moisture levels can cause difficulty in obtaining sufficient packing to exclude air and may result in molding or other spoilage. Too high a moisture content causes nutrient losses by seepage and results in the



Fermentation

Fermentation can be described as the break down of complicated carbohydrates into simple sugars, and acids that can be more efficiently utilized by animals. The breakdown is done by anaerobic bacteria (they require absence of oxygen) which produces the acids that preserve forage as silage.

Lactic, Propionic and Acetic acids preserve the plant material by reducing the pH to 4.2 or lower. This low pH inhibits further bacterial growth and enzyme action. This process takes a varied amount of time depending on silage type usually from 3-6 weeks

The most critical time in silage making is during the first few hours of storage. Long exposure of the forage to air may result in the disappearance of much of the readily available carbohydrates. This may prevent the production of adequate amount of lactic acid and result in a

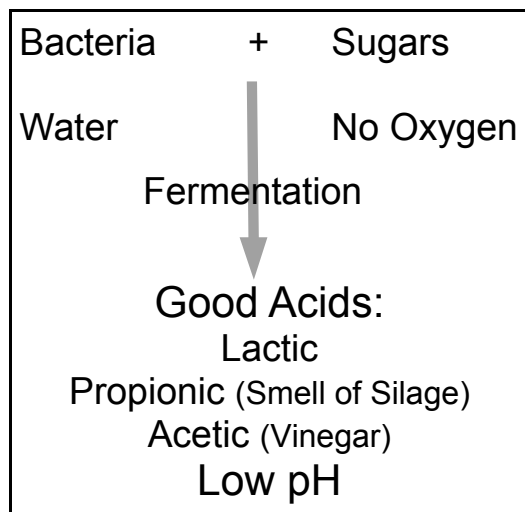
production of organic acids such as butric acid (turns off cows appetite) resulting in unpalatable silage.

When forages are chopped and stored in a pit or silo in the absence of air, fermentation occurs starting the breakdown of the carbohydrates in the plants. If the silage is exposed to air Ammonia is produced from the Nitrogen in the plants, tying up the protein in the feed, reducing the feed quality.

Ensiled forage can be stored for a longer period of time with lower loss of nutrients than dry hay. The nutritive value of silage depends upon the type of forage ensiled and how successfully it has been cured.

high pH conducive to deterioration of the plant material. Undesirable bacteria, belonging to the genus *Clostridium*, grow under high pH and result in butyric acid, ammonia, and various amines associated with poor silage quality.

By packing silage well, making storage airtight and sealing pit as soon as possible to prevent air from entering, production of poor quality silage can be prevented.



Economics Background

Producer **John Milne**, Fairview, provided these numbers as they reflected his farm operations. Things he felt were not included in these numbers were:

1. \$1.00 / ton for plastic.
2. Quality of silage was better as pit was open for less time with custom operation.
3. His time, which he could have used to do something else.
4. When he hired custom silagers, silage was up in 2-3 days with himself took 2-3 weeks with breakdowns etc.



Conditioning silage

Economics

Wet Year

Custom Processed
Average Yield 10 tons/ac
Processed 8 loads/hr @ 12 ton/load = 96 tons/hr

Cost:	
Chopper	\$350 / hr
3 trucks @ \$50/hr	\$150 / hr
Packer	\$ 60 / hr
Swather	<u>\$ 75 / hr</u>
	\$635 / hr
<u>\$635 / hr</u>	96 ton / hr = \$6.61 / ton

Production Cost	
60 lbs N / acre @ \$0.16	\$9.60/ac
Seed Barley 2 bus @ \$4	\$8.00/ac
Seeding Costs	\$7.00/ac
Taxes	<u>\$3.00/ac</u>
	\$27.60

\$27.60 / 10 ton/ac = \$2.70 /ton

\$2.70 + \$6.60 = \$9.31 /ton silage

@ 40% D.M. =\$23.28 /ton of D.M.

Dry Year

Custom Processed
Average Yield 4 tons/ac
Processed 4 loads/hr @ 12 ton/load = 48 tons/hr

Cost:	
Chopper	\$375 / hr
2 trucks @ \$60/hr	\$120 / hr
Packer	\$ 60 / hr
Swather	<u>\$ 75 / hr</u>
	\$630 / hr
<u>\$630 / hr</u>	48 ton / hr = \$13.13 / ton

Production Cost	
50 lbs N / acre @ \$0.20	\$10.00/ac
Seed Barley 2 bus @ \$4.5	\$9.00/ac
Seeding Costs	\$7.00/ac
Taxes	<u>\$3.00/ac</u>
	\$29.00

\$29.00/ 4 ton/ac = \$7.25 /ton

\$7.25+ \$13.13 = \$20.38 /ton silage

@ 40% D.M. =\$50.95

Using Own Equipment

Bought a used chopper & hi-dump
@ \$ 7000.00
Average Yield 4 tons/ac
Processed 3-4 loads/hr @ 5 ton/load = 15-20 tons/hr

Cost:	
Chopper Tractor	\$ 60 / hr
Chopper	\$ 30 / hr
1 truck @ \$40/hr	\$ 40 / hr
Packer	\$ 60 / hr
Swather/conditioner	<u>\$ 30 / hr</u>
	\$220 / hr
<u>\$220 / hr</u>	20 ton / hr = \$11.00 / ton

Production Cost	
20 lbs N / acre @ \$0.50	\$10.00/ac
Seed Barley 2 bus @ \$5	\$10.00/ac
Seeding Costs	\$6.00/ac
Taxes	<u>\$3.00/ac</u>
	\$29.00/ac

\$29.00 / 4 ton/ac = \$7.25 /ton

\$7.25 + \$11.00 = \$18.25 /ton silage

@ 50% D.M. =\$36.50 /ton of D.M.

Compare to hay: \$50.00 /ton

@ 85% D.M. \$50/0.85 = \$58.82 /ton DM

..... are sociologically, ecologically, and economically sound.

Timing of Cut

The earlier in the season forage grasses and legumes are cut the higher the quality; however, yield is not as high early in the year. By using multiple cuts or grazing the regrowth optimal utilization of the crop could be achieved.

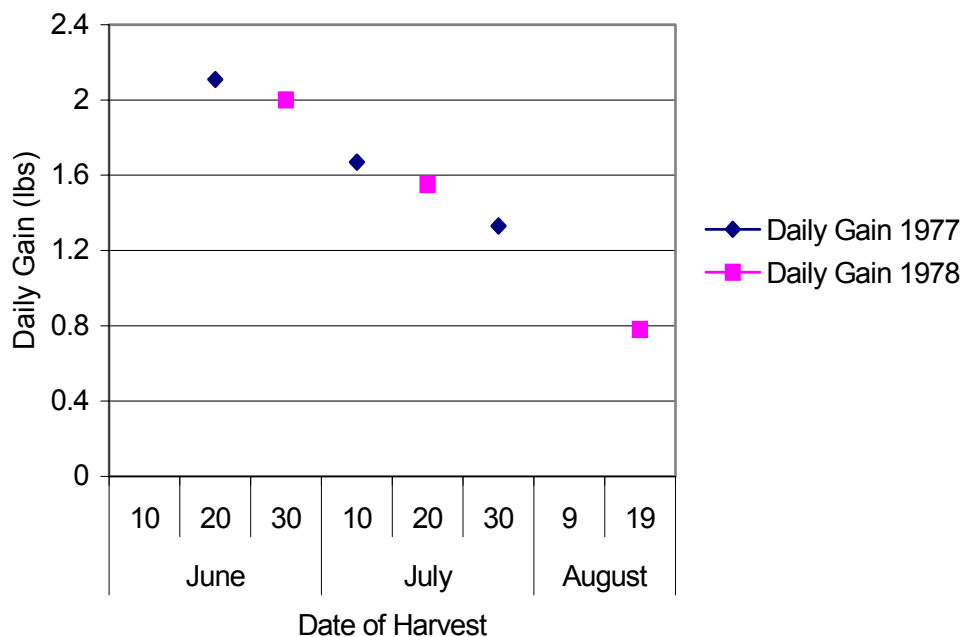
Piling Silage on the Ground Does Work!!!!

Excellent quality silage can be piled on the ground. The key to making good silage in a pile is to ensile at the proper moisture and pack sufficiently using a tractor.

Putting up silage too dry and not packing it correctly or long enough will result in poor-quality silage. Producers recommend packing silage across the pit as opposed to along it to get a better pack. Also make sure the system is airtight when done, by putting hay bales or tires on top of the edge of the plastic.

If silage will be fed during the wetter parts of the year, a gravel base in front of the pile may be necessary.

Relationship Between Ensiled Grasses Harvested at Different Dates and Daily Gains for Steers



Relationship between ensiled grasses harvested at different dates and daily gains of silage fed steers. Each point represents the mean of one silage fed to 12 steers for 112 days.
Reference: Viera, et al., 1982

Fungus Free Silage

1. Rain increases fungal growth
2. Dead material and dirt increases risk of fungus in silage
3. Increased plant density increases fungal risk
4. Plastic must be in contact with silage
5. Spaces in the silo or pit or tube increases the risk of growth
6. Leaky silage pits encourage fungus growth

Golden Rules of Silaging

1. Time the cutting of forage to match desired quality keeping in mind as yield increases later in season as quality is declining.
2. Get forage off field into storage as fast as possible for best quality.
3. Make sure forage enters silos at appropriate moisture.
4. Pack the silage, to prevent air from accessing silage.
5. Seal storage as soon as possible, air entering leads to spoilage.

Compiled by: Julie Robinson,
Sources: Robert Westra, John Milne, Bill Wilson

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