

Silage Leachate: A Problem with Potential Benefits

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**Waste Management
Learning Center**

*Livestock Environmental
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Why is Silage Leachate a Problem?

Silage leachate (SL) is the term used to describe liquid runoff from silage piles in upright structures, bags or bunkers. Leachate is an organic liquid that is the result of pressure in the silo or the presence of excess water. Properly ensiled silage results in little or no leachate.

SL seeping from silage piles presents a serious environmental problem. On average, leachate is 40 times stronger than dairy parlor wastewater and up to 200 times stronger than raw sewage.

The acidity of SL nutrients can harm groundwater or kill vegetation in the area where it drains. It also has a high biochemical oxygen demand (BOD), meaning SL has a high potential for consuming oxygen. When leachate enters a stream or pond, it removes the oxygen necessary for marine life. High ammonia levels in leachate are also toxic to fish. The phytonutrients may also cause algae blooms.

Causes of SL Contamination

- Locating silage piles too close to a water source, where leachate may enter water through runoff or soil seepage.
- Constructing silage pits so ground or surface water can enter and drain through the silage.
- Improper moisture content before ensiling. This greatly increases the liquid content and causes leaching from the silage pile.
- Allowing silage leachate to enter surface or subsurface drainage systems.
- Poor coverage and sealing of silage stacks allowing rain and air in.

Control and Disposal of SL

- Locate silos as far as possible from water resources — surface water, wells, sink holes, and any direct path to groundwater. The minimum recommended distance is 300 feet.
- Divert leachate to a well-ventilated, open-top manure storage facility or filter it through the use of buffer areas or constructed wetlands. Do not add SL to enclosed storage facilities. When mixed with manure, SL produces hydrogen sulfide and other hazardous gases that can kill animals and humans.
- Keep clean water from mixing with the silage with diversion trenches, roofs or covers over the silo. This protects the quality of the silage and decreases the potential for leachate runoff.
- Dilute SL with equal parts of milk parlor wash water or feedlot runoff to use for irrigating crops.

Construction

Properly lined silage pits improve compaction and sealing of the stack.

The silage pit floor should be watertight and slope toward a drainage channel. Expansion joints should be sealed with a flexible compound. Note that silage leachate is extremely corrosive and can damage concrete and steel. Divert storm water with a channel on the hillside above the silage pit.

Covering

Poor covering lets in rain and air, which increases leachate and decreases silage quality. Cover stacks during and immediately after filling. Seal the edges to keep rain out. Keep the cover as intact as possible when you start to feed out.

Wilting of Silage

Well made, good quality silage will produce little if any silage leachate. Wilting the cut plant material before ensiling will considerably reduce effluent quantity and increase feed quality.

| Preparation of grass ensiled | Gallons of effluent per ton of grass |
|------------------------------|--------------------------------------|
| Leafy grass, no wilting | 125 |
| Wilted to 20% dry matter | 12.5 - 30 |
| Wilted to 25% dry matter | 0 - 7.5 |

Silage Dry Matter can be roughly assessed by twisting a handful of silage:

- Juice comes out easily = 18%
- Juice comes out with difficulty = 18–22%
- No juice, but your hands are moist = 22–27%
- No juice and your hands are dry = >30%

To maximize dry matter, allow a minimum of six hours drying time after cutting; 24 hours is preferable. Using mechanical conditioning and chopping increases the speed of wilting.

When the crop cannot wilt due to wet weather, make sure measures are in place to deal with the effluent.

Silage Leachate's Potential

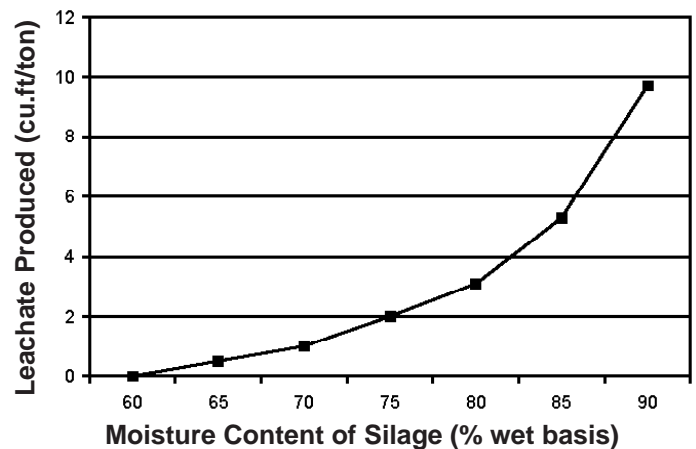
Silage leachate makes an excellent fertilizer. Diluted 1:1 with water and spread at a rate of 2,500 gal./acre the mixture can provide:

| Nutrient | Amount (lb/acre) |
|------------|------------------|
| Nitrogen | 25–75 |
| Phosphorus | 25 |
| Potassium | 100 |

Summary

Although heightened awareness of silage leachate and runoff is necessary at harvest time, producers must realize it poses a serious environmental risk year-round. As responsible stewards of the environment, all producers need to be aware of the risk of silage leachate and take appropriate steps to reduce and manage it.

Table 1. *Estimated Silage Leachate Production*



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