The Economics of Bale Wrapping

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Numerous options are available for storing haylage on livestock operations. The most common methods are bunker silos, bagging haylage and bale wrapping. Interest in bale wrappers as a method for storing haylage has grown in recent years. It can be a cost effective way of producing and storing haylage, not requiring a bunker silo capital expenditure.

A grass-based beef producer in Milan, MN, invested in a bale wrapper to produce haylage for his beef herd's winter feed supply. The costs of owning and operating a bale wrapper have been assessed.

After the forage has been cut, it is allowed to wilt to 40-50% moisture, then baled into round bales and brought to the wrapper. The bales are wrapped in plastic immediately after baling at the place where they will be stored. A 5x4 ft bale weighs 2,000-2,500 pounds. After the bales are wrapped, the forage is allowed to ferment into haylage.



How much does it cost to own and operate a bale wrapper? The purchase price of the wrapper is \sim \$20,000. Fixed costs include depreciation, interest, insurance, storage, and repairs. The total fixed costs are \$2,671 annually. Assuming 1,000 bales/year are wrapped, the annual fixed cost/bale is \$2.67 on an "as is" basis. The assumption of wrapping 1,000 bales/year is based on the amount of wrapping that is done by the beef producer in this project. If fewer bales are wrapped, the fixed cost/bale will increase.

The plastic wrap costs \$80/roll. Two rolls can wrap 70 bales in 5-6 layers of plastic. Plastic caps are placed at the ends of the row of wrapped bales. Plastic and end caps cost ~\$2.43/bale. Estimating the amount of time required to wrap 1,000 bales is an important part of calculating operating costs, affecting labor cost and cost for operating the tractor needed to place the bales in the wrapper. The amount of time needed will depend on the number of bales that can be wrapped/hour. Manufacture specifications suggest 120 bales/hour can be wrapped assuming bales are continuously fed into the wrapper. If 100 bales were wrapped/hour, it would take 10 hours to wrap 1,000 bales. If 60 bales were wrapped/hour it would take 17 hours to wrap 1,000 bales.

It takes two people to run the wrapper, one to transport the bales from the field to the wrapper while the other feeds the bales into the machine. Labor is charged at \$13.50/hour/person. In addition to labor, the estimated cost of operating the 100 horsepower tractor is \$17.50/hour. This includes both overhead and operating costs.

	Cost/bale (100 bales/hour)	Cost/bale (60 bales/hour)
Plastic wrap	\$2.43	\$2.43
Fuel & Lubrication	\$0.11	\$0.11
Labor	\$0.71	\$1.18
Tractor	\$0.17	\$0.29
Total Variable Cost	\$3.42	\$4.01
Total Fixed Cost	\$2.67	\$2.78
Total Cost	\$6.09	\$6.79

Table 1. Breakdown of costs associated with owning and operating a bale wrapper.

A breakdown of the costs of owning and operating the wrapper assuming 1,000 bales/year are shown in Table 1. Wrapping fewer bales/hour affects the labor and tractor costs. Increasing the wrapping rate from 60-100 bales/ hour reduces the variable cost by \$0.59/bale wrapped, while reducing the fixed costs by \$0.11/bale.

Calculations were done on an "as is" basis assuming 2,500 lb bales at 50% moisture and 60 bales/hour. The total cost/ton of DM is \$10.86. Some estimates indicate the cost of bagging haylage to be 20-50% higher than the cost of bale wrapping, depending on the number of bales stored/year.

It is important to note these costs are for the bale wrapping operation only. They do not include the costs associated with mowing, baling, storing or feeding the haylage. The cost of a forage storage system is just one item that must be considered when choosing a haylage system. Storage and feeding must also fit with the management of the farming operation.