Wisconsin - Excellent Preservation of Wet Alfalfa 'Hay' Bales with Plastic Wrap

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Substantial DM yield and quality losses can occur when partially dried alfalfa is rained on before moisture reduction to levels acceptable for dry hay storage. This research assessed the feasibility of preserving alfalfa baled at <45% moisture by wrapping in plastic film.

Large round and large square bales were preserved as individually wrapped or tube-wrapped 'silage' bales at 2 moisture ranges: ~40-55% and ~30-40%. The tube-wrap system was 50% more productive while requiring 43% less plastic compared to individually wrapped bales.

Average DM loss during storage was only 3.5% and 2.3% for the high- and low-moisture ranges, respectively. After either 5 or 11 months in storage, DM losses were < 7% for all treatments (Table 1).

Generally, there were no differences in DM loss or nutrient retention between round and square bales, bales wrapped individually or in a tube, or high- and low-moisture ranges.

Table 1. *Bale moisture, DM loss, and fermentation products for alfalfa large-round bales formed in June (1st cutting) and July (2nd cutting) in 2000.*

Cutting & Days in Storage	Wrap Type	Moisture %		DM Loss % of total	pH	Fermentation Products % DM	
		Initial	Final			Lactic Acid	Acetic Acid
1st Cutting 154 Days in Storage	Tube	41	43	4.3	4.9	2.49	0.68
	Tube	32	33	2.5	5.8	0.31	0.25
	Individual	31	31	1.9	5.9	0.02	0.16
	LSD (0.05)	3	3	3.2	0.3	0.62	0.14
2nd Cutting 364 Days in Storage	Tube	47	48	2.9	4.9	4.29	1.52
	Tube	36	37	2.4	5.2	1.48	0.45
	Individual	37	37	1.3	5.3	1.17	0.49
	LSD (0.05)	3	2	1.9	0.3	0.62	0.25

Fermentation products were significantly affected only by initial moisture content; low-moisture bales produced lower levels of acetic and lactic acids and had higher pH than bales at higher moisture. However, heating rate of the low-moisture silage bales ~1 year after removal from storage was acceptable, taking ≥ 7 days to heat to 95° F.

Although below the moisture range usually considered acceptable for chopped silage in bunk or bag silos, preservation of bales at both moisture ranges was excellent despite the limited production of desirable silage fermentation products. However, the low levels of fermentation products could result in instability at feeding under some conditions.