WISCONSIN - Prolonged Field Exposure After Cut-Alfalfa Receives Rain Reduces Ensilibility & Nutritive Value

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Conserving high-quality alfalfa silage during unstable, inclement weather is a challenge. Within a series of experiments, rainfall events were applied to wilting alfalfa by both simulated (using a rainfall simulator) and natural methods across four different harvests.

Simulated rainfall was applied to relatively wet alfalfa, which was then dried to ensiling moisture under near-ideal conditions in a constant-temperature/humidity environmental chamber for ≤ 21 hours. With this rapid wilting after simulated rainfall, indicators of ensilability and nutritive value changed minimally. There were consistent reductions in water-soluble carbohydrate (WSC; sugars) and starch content, but WSC changes under ideal drying conditions following simulated rainfall were modest, possibly due to breakdown of starch into sugar subunits.

Table 1. Changes in quality and ensilability of alfalfa after ~2" of rain and prolonged field exposure.

	At Cutting	After Exposure
Fresh pH	6.5	7.4
Water-Soluble Carbohydrates (%)	6.1	2.9
Starch (%)	2.3	0.5
Maximum Moisture (%) to Avoid Butyric-Acid Silage	63	59

When alfalfa was subjected to natural rainfall events followed by prolonged field exposure, indicators of ensilability and nutritive value were reduced much more markedly. In one trial in which wilting alfalfa received ~2" of natural rainfall over a prolonged 8-day field-exposure period, fresh pH increased significantly (Table 1). Furthermore, there were sharp reductions in WSC, starch, and thus the maximum moisture content allowable to avoid clostridial fermentation and butyric-acid silage.

Based on these experiments, ensilability of alfalfa is affected only minimally by a single rainfall event shortly after cutting, as long as the ensuing weather supports rapid dehydration to an appropriate ensiling moisture. However, achieving good silage fermentation with cut-alfalfa subjected to prolonged exposure under less-ideal field-drying conditions appears to be far less likely. It also should be noted that these studies did not include assessments of bacterial populations associated with the forage; these populations also could be altered by rainfall events and subsequently affect silage fermentation.