GUEST COLUMN

Take the Risk Out of High Moisture Hay

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Hay and dairy producers are familiar with problems associated with putting up the perfect hay crop. Establishing a good stand, choosing the right weed control, and managing equipment breakdown, all while battling the weather, means every cutting is different. Improvements in genetics, chemistry, and metallurgy make hay production more predictable, but nothing can change the weather. One technology to shorten the time between cutting and baling is the use of buffered organic acids. Baler acids are sold by many companies and most use propionic acid as the main ingredient. Applying a preservative which is propionic acid-based will control mold and yeast growth in the bale, allowing baling at moisture percentages of up to 25-30%. Hay and dairy producers often ask, "Are these products worth the investment?"

Research conducted in central California by Dr. Ken Griswold of Kemin Industries (California trial) and Dr. Wayne Coblentz at the USDA-ARS Dairy Forage Research Center in Marshfield, WI, (Wisconsin trial) attempted to answer this economic question[1,2]. Both trials evaluated the application of a buffered blend of organic acids to large rectangular bales, internal bale heating, and final bale weights.

One of the major concerns when producers use a baler acid and bale wet hay is heating. Mold and yeast produce heat when they grow. This heating can cause browning reactions which bind nutrients and energy loss from the bales. In some cases, the heat generated has caused barn fires.

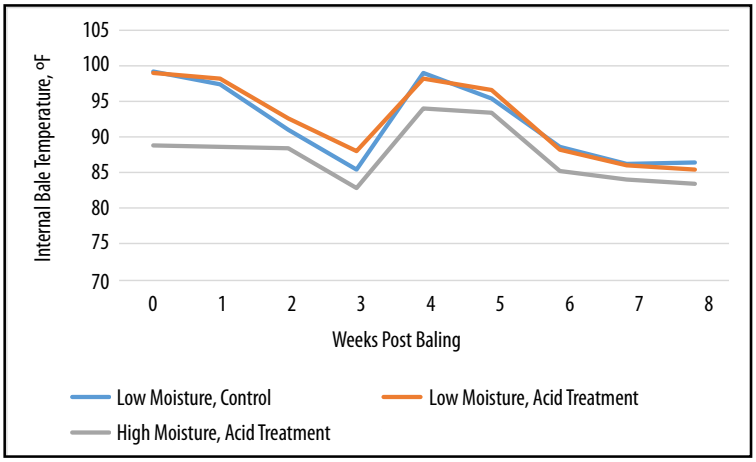
The Wisconsin trial monitored bale heating for 73 days. The application of the blended, buffered acid product reduced the maximum internal bale temperature during storage by 20.5°F. When the blended, buffered acid product was applied at a 1% rate to alfalfa/orchard grass, the hay baled at 27% moisture. When a preservative was applied to the same hay at a 0.6% rate, the maximum temperature within these hays was reduced by 9°F.

The California trial showed similar results. In this trial, the hay was baled at two moisture levels, high (22-25%) and low (10-12%). The treated bales received the label recommended level of acid (8 lbs/ton for low moisture and 12 lbs/ton for high moisture hay). Temperatures were recorded weekly (Figure 1) during the curing period. At every recording period, the temperature inside the high moisture, treated bales was lower than either of the low moisture bales – regardless of treatment.

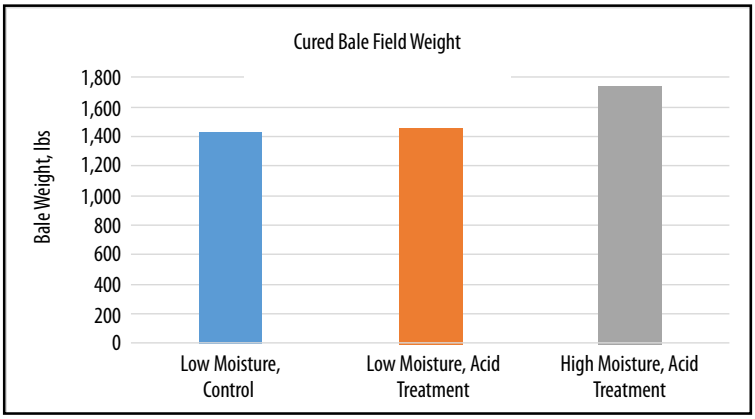
Producers use a baler acid to retain more leaves, a large source of protein in alfalfa hay. Leaf loss associated with handling hay when it is too dry can be significant. In one study, hay was raked at 20% moisture content and 21% of the leaves were lost[3]. The loss of leaves can reduce the nutritional value of hay. For dairy producers who feed the hay they grow, retention of leaves is an extremely important parameter to measure.

Another benefit of additional leaf mass, especially for producers who sell hay, is increased cured bale weights. In the California trial, hay baled at higher moisture and preserved with an acid treatment was significantly heavier than hay baled at low moisture, regardless of treatment with acid (Figure 2).

[1]Figure 1. Effect of moisture level at baling and FRESH CUT® Plus on internal bale temperature over time.



[1]Figure 2. Effects of moisture level at baling and acid treatment.



In the Wisconsin trial, following the 73-day storage period, final wet bale weights for the 1.0% and 0.6% acid-application levels were 57 and 53 pounds greater than untreated control hays.

Time after time, baler acids are valuable tools producers can use to help harvest the perfect hay crop. Using baler acids reduces the risk of bale heating and preserves more leaf mass. This forage management tool can result in higher quality hay and a greater quantity hay crop.

References
1 Griswold, K. G, R. Almada, A. Lipata and E.E. Rodberg. Effects of moisture level at baling and FRESH CUT® Plus on quantity and quality of harvest alfalfa hay, 2014 ADSA-ASAS-CSAS Joint Annual Meeting.
2 Coblentz, W.K., K.P. Coffey, A.N. Young and M.G. Bertram. Storage characteristics, nutritive value, energy content and in vivo digestibility of moist, large rectangular bales of alfalfa-orchardgrass hay treated with propionic acid-based preservative, J. Dairy Sci 96:2521-2535, 2013.
3 Orloff, S. B., and S. C. Mueller. 2008. Harvesting, Curing, and Preservation of Alfalfa. In: UC-Davis ANR Publication 8300: Irrigated Alfalfa Management, Ch. 14, 1-18.