Pros and Cons Of Methods To Speed Hay Drying

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High quality forage is recognized as an important requirement for maintaining maximum production of cattle, particularly in dairy production.

The greatest obstacle to producing high quality hay is rapid field curing. In our climate, adequate periods without rainfall are sporadic and hard to predict.

Conditioning Methods

Mechanical conditioning treatments are often used to speed hay drying. These can be categorized as either roll or flail conditioners. Rolls smash and/or break the plant stems, and flails abrade the waxy surface of the plant and break stems.

Both processes can improve drying. For alfalfa, however, roll devices are more effective — with less field loss.

Some roll designs are promoted for faster drying, but field and laboratory studies consistently show little or no difference in the drying of alfalfa or grass treated with commonly used crushing roll designs. Roll conditioning is most effective on a thick stemmed crop such as an early cutting of alfalfa. Flail type conditioners are better suited to grass crops, and they provide a greater throughput capacity when harvesting high yielding or entangled crops.

Adjustment of the conditioning mechanism can effect drying. Roll clearance and pressure often can be adjusted. A minimum clearance must be maintained. If the clearance becomes too close, excessive damage and loss of plant particles occurs. With too much clearance, plant material can flow between the rolls with little crushing. Too little or too much pressure on the rolls has similar effects. On flail type conditioners, the clearance between the rotating flails and a stationary bar can be adjusted to control the amount of breaking and abrasion that occurs.

Dry matter losses and the associated nutrient changes caused or promoted by conditioning increase with crop maturity and the severity of conditioning. Although more severe conditioning can provide faster field curing, harvest losses are generally greater. Normally moderate conditioning is recommended to obtain adequate drying with relatively low loss (1-2 percent of yield). This relatively low loss has little effect on forage quality.

Swath Manipulation

As forage dries in the field, the top of the swath dries more rapidly than the bottom. Manipulation of the swath can speed the drying process by moving the wetter material to the upper surface. There are three operations used in haymaking to manipulate the swath: tedding, swath inversion, and raking.

Tedding can be used anytime during field curing, but it is best to do so before the crop is too dry (above 40 percent moisture content). The stirring or fluffing of forage typically reduces field-curing time up to half a day. Tedders are sometimes used to spread a narrow swath formed by the mower-conditioner over the entire field surface. When done soon after mowing, the average field curing time is reduced up to two days compared to drying in a narrow swath. In addition to speeding drying, tedding also tends to create more uniform drying, so wet spots in the swath are reduced.

Disadvantages of tedding include increased losses and increased fuel, labor, and machinery costs. When tedding is done on a relatively wet crop (above 50 percent moisture), the resulting loss is less than 3 percent. However, applied late in the drying process, the loss can be more than 10 percent. Tedding will also increase raking loss. When a light crop (less than 1 ton/acre) is spread over the field surface, raking loss can be more than double that when raking narrow swaths.

Spreading the hay may also promote bleaching of hay color. Bleaching does not necessarily affect the nutritive value of hay, but it often affects the market value. When the costs of performing the tedding operation are compared to the benefit received, routine use of tedding is difficult to justify, particularly for alfalfa. Occasional use under difficult drying conditions may bring greater economic benefit.

Swath inversion machines have been used that gently lift and invert the swath. Exposing the wetter bottom of the swath speeds drying, reducing the average field-curing time a few hours. Swath inversion is not as effective for improving drying as tedding, but shatter loss is very low. With less drying benefit, there is less potential for reducing rain and respiration losses. The added labor, fuel, and machinery costs of the operation are generally greater than the benefit received.

Raking is another form of swath manipulation. Raking tends to roll the wetter hay from the bottom of the swath to the outer surface of the windrow, which improves drying. Following the initial improvement, the increase in swath density can reduce drying rate, so the crop moisture content at raking is important. Raking also causes loss, and the loss is related to crop moisture (2 percent when wet to 15 percent in a very dry crop). The best moisture content to rake for low loss and good drying is between 30 and 40 percent. In dry weather periods, hay can be raked in the evening or early morning when leaves are moist and less prone to shatter. Raking at the proper time can reduce field-curing time a few hours to allow an earlier start to baling.

In haymaking, the best recommendation is to dry hay rapidly. Mechanical conditioning should be used, and high yielding crops should be spread in wide swaths. Tedding may be useful in drying grass crops, but it should be avoided with alfalfa, particularly after the crop has partially dried.

In silage making, drying is a little less critical. Wilting in narrow swaths can reduce raking loss, particularly for low yielding harvests. Raking can be used to improve harvest capacity. A substantial economic benefit can often be obtained by rolling swaths together to allow large balers or forage harvesters to operate more efficiently.

Conclusions

Rapid field curing is important and a good mechanical conditioner can help. Spread hay in wide swaths to further speed drying, but avoid very thin swaths to reduce raking loss. Tedding may be useful in drying grass crops, but it should be avoided with alfalfa, particularly after the crop has partially dried.

Bale hay at about 18 percent moisture in low-density bales, but use a lower moisture content for high-density large bales. Avoid routine baling of high moisture hay. When damp hay is baled, use an organic acid based treatment to help preserve hay.

Remember that on the dairy farm, only about one third of the forage needs to be of the highest quality when that forage is segregated by quality and fed to animal groups accordingly.

Youth Grassland Contest Set

ROCKSPRINGS (Centre Co.) — The first annual Project Grass Youth Grassland Contest is set for May 7 in Rocksprings. The training session for FFA teachers and 4-H leaders took place March 12.

The contest is open to FFA and 4-H students who are either enrolled at the high school level or have graduated at the end of the school year prior to the contest.

A contest team will consist of a maximum of four or a minimum of three students. It is the goal of Project Grass to be able to offer each individual on the first place team a $500 scholarship, a $250 scholarship for each individual on the second place team, and a $500 scholarship for the highest scoring individual.

For more information, please contact Project Grass Youth Development and Outreach Chairman Bobbi Bailey, Donohoe Center, RR 12, Box 202C, Greensburg, PA 15601, phone (724) 834-3970 ext. 119, or e-mail bobbi.bailey@pagreensbu.fsc.usda.gov.

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