

MAKING BIG BALE HAYLAGE

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The subject of this composition is baling haylage, or wet hay, as a means of forage harvesting and storage. This technique differs from conventional haylage harvesting and storage procedures in several important ways. In the first place, it is baled, not chopped or flailed in to short pieces, secondly the haylage is stored in a stack, rather than in a bag, bunker, pit or silo. Thirdly, the baled haylage can be readily loaded on standard trucks and transported short or long distances. It can be quickly unloaded at the delivery site, and easily fed. Finally, this is a high volume system where large tonnages can be quickly baled, hauled, stacked and stored. Haylage, for the purposes of this paper, is material that has a 40% to 60% moisture content, is either alfalfa or grass and is stored in an air-tight enclosure. To obtain information on optimum cutting times for achieving the best feed characteristics with haylage, inquire at the University of California, Davis. This paper proposes to describe a haylage processing technique that is new, more efficient, and less costly per ton than older systems.

In order to get started, we need a swather that will lay down a windrow from 40" to 46" wide. Wide windrows provide for fully formed, uniformed bales. Next we need a baler, and because the author is biased, we will choose a Freeman 1590 Big Baler. The five foot long bales, which we'll make, will weigh about 1500 to 1600 pounds, so we'll need a decent sized front loader or a squeeze to load the bales onto trucks in the field for transport to the storage site. At the storage site, another front loader or squeeze will be needed to unload trucks and build the storage stacks.

Two layers of .125 mm thick plastic paper will be used to cover and seal the haylage storage stack, air-tight. A supply of sand or dirt should be available. The width of the plastic paper should be enough to cover the top and sides plus two feet of excess on each side for sealing purposes. The sand or dirt will be piled onto the excess paper around the base of the stack for weight to achieve the necessary air-tight sealing. A supply of used tires and plastic twine should be available. The tires, tied together with a length of plastic twine, will be draped across the top of the stack. They will hang down on each side of the stack and serve as weights to hold the paper down during gusty days or wind storms. The tires should be spaced two to three feet apart along the stack for best results. For additional weight, fill the tires with sand. The object is to cover the stack so there are no air spaces, and that the stack cover is air-tight.

Once the stack is opened, spoilage will begin to occur in about three weeks; therefore "feed blocks", stacks within the main storage stack, are formed. These feed blocks are totally sealed units and two or more of these units make up the main stack. The feed blocks consist of the amount of haylage which will normally be consumed during a three week time period. The number of bales, and thus the size of the feed block, is determined by how many pounds of haylage each animal eats per day times the general number of animals to be fed per day times 20 days. The bales should be weighed to learn the average weight of each bale. That weight is divided into the pounds of feed per 20 days to provide the number of bales that will make up each individually sealed feed block. The size of the feed block, and the number of them per stack site will determine the space required for each main storage stack. Whether the feed blocks or stacks are three bales wide and three high, or two high etc., will depend on paper costs and available storage stack space.

Selecting the storage stack site is an important task. Mistakes made here can sometimes provide daily consequences. The major admonition is to locate the site on high ground with good drainage so it doesn't become flooded. A cement pad is best, but dry, level ground will also work. Next, if possible find a site that is protected from the wind. It is very important that the storage stack does not become unsealed. Good access, for building the stack to begin with and then feeding afterward, is vital. If the area becomes a quagmire during the feeding season, costs go up sharply.

To get started baling haylage, swath the hay into windrows which are 40" to 46" wide. Let one day pass if it's sunny and warm, add a day if it's cold and wet. Baling can begin anytime the material is between 40% and 60%. It is important to have the bale transport equipment in the field ready to go, and the equipment for building the storage stack at the

site ready. The sealing materials; the plastic paper, sand, used tires and twine should be ready at hand. The bales should be sealed up in the stack within 4 or 6 hours after they've been baled. Bales which can't be stacked and sealed within the time period, should be promptly fed. They won't store well in the open. As each feed block is completed, it should be sealed. As each stack is completed, it should be sealed. (See illustrations 1-5) In the typical feed block, the block is formed by laying three bales flat, end to end, and perpendicular to the direction of the length of the stack. The bales should be compressed tightly together to minimize air spaces. The next three bales are placed on top of the first three and compressed. This process is repeated, with the bales being stacked as tightly as possible until the feed block, or stack is completed. If the stack is a feed block, seal off the face of the feed block and start another feed block against the sealed face. When the storage stack is completed, seal it using the paper, sand and tires. Remember, the bales must be sealed in a stack within four to six hours after being produced by the baler. Therefore, bale only as many bales as can be stacked and sealed within the time constraints.

This system doesn't manage itself. Rather, it requires good oversight to assure that all the elements take place on time and that the procedures are performed correctly. The stack sites should be checked weekly to catch any seal problems that may arise and to keep the weights in place to prevent any problems from wind damage. Feeding procedures should be developed that include good re-sealing techniques to minimize or prevent spoilage. The haylage bales breakup readily and feed easily. Like baled hay; keeping track of the twine from the haylage bales for disposal purposes is important. The plastic paper can be re-used, if cared for properly, and the tires stored for next year's use.

The benefits to baled haylage are several; beginning with the bales being cheaper to make, to store and cheaper to feed. Additionally, the system is relatively weather proof, and is man hour efficient, all phases being mechanized except the final sealing procedure. To feed out, only a front loader is needed to remove the bales from the haylage stack. Haylage bales can be easily loaded on trucks for transport to feeding sites many miles from the storage area. Feeding the bale is quick and efficient using Kerby or Hesston bale processors. Green baling (not green chopping) the hay might, in some peoples opinion, increase annual crop yields somewhat. Bagging, filling pits, bunkers or blowing haylage up into silos all have their fans, however each of these systems is slow inefficient and costly. For those who might want to sell haylage to someone else, storing it in these bags bunkers or silos makes it difficult and expensive to load, deliver and feed. Not surprisingly the haylage market today is small and relatively inactive. Baling haylage, presently popular in Holland and Japan, will become tomorrow's preferred technique with well managed cost efficient operations in California and haylage will become an important component of the dairy feed ration.

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FORMING AND SEALING A HAYLAGE STORAGE STACK

