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Crop Soil News

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"It is the crops that feed the cows that make the milk which creates the money."

How to make haylage-in-a-day fail!

Ensiling hay crop silage at the correct moisture the same day you mow it continues to expand across dairy farms. Yet there are some who have not been able to make it work. Here are a few of the reasons:

Mow when the sun is not shining and expect it to

dry. When we first started, a farmer switched to wide swath, no conditioning. He called the next day to say (irately) that it did not dry at all. I had mowed at the same time for dry hay using a conditioning mower and mine had not dried at all either. It was overcast and cool (damp, dark day). I noted to him that the sun was coming out in his area first and it should start drying. He called back two hours after and said the sun came out and he was chopping 35% dry matter material! The sun is absolutely critical for two reasons. First is that the early dry down is driven by photosynthesis. This is where the plant takes water and carbon dioxide (critical for plants to grow- not a pollutant) and makes carbohydrates (to support life) and oxygen (for us to breath). The more of the plant exposed to sun the faster it dries as photosynthesis is operating and using plant moisture. Moisture is also leaving through the stomata where the carbon dioxide comes in and the oxygen goes out. This continues down to below 60% moisture - where it gradually tapers and stops (unless the leaf is in the dark of a windrow – then it immediately stops). All that photosynthesis produces sugars and starches. They can't move to the roots because the plant is cut, thus increasing the feed value of your forage to almost equal to corn silage energy. The second reason the sun is critical is that the more of the plant material exposed to the sun, the faster it physically dries. This has been found to be the most important drying factor outside of photosynthesis. More sunshine hitting the swath increases the drying rate through higher temperature of that material and the temperature of the air in the swath. This increases the increases the vapor deficit (dries the air) in the swath allowing moisture to leave the plant quicker. These factors; sunlight on the swath; temperature of the swath; temperature of air in the swath; and the vapor deficit are the most important non biological factors accelerating drying. Without sunshine, they do not work just like your tractor can't work without fuel.



Sunlight is critical to photosynthesis that does the majority of early drying. Cloudy days like this, the process is greatly reduced or stopped.



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Run your mower at less than 80% of cutterbar width so you don't have to rake. Every inch the swath is reduced, the drying of that reduced area is reduced. Many machines make two windrows with a thin wide swath in the middle (photo at right). The middle dries fast while the side windrows dry only on the thin upper surface. As the swath gets narrower, the windrows at the edge of the swath get bigger (greater percentage of material not drying) until they eventually meet as one big windrow (60% of cutter bar width is where this occurs and many machines are at this width even all the way open). Many mowers cannot lay it out at greater than 80% of the cutterbar. This is a major source of frustration for both the farmers and myself. Some equipment companies have jumped on the opportunity to adapt their machines to this new, more effective wide swath technique. Others have simply ignored it and pretended there is nothing wrong and sell machines that reduce drying. Both Dr. Cherney at Cornell and myself have come to the conclusion that any swath less than 80% of the cutterbar width, will be problematic for same day haylage on heavy and first cut crops. As farmers are ingenious, the photo at right shows a simple solution to get a machine with marginal swath width and change it to over 90% of width. The center diverters were removed because there was no material being deposited because they worked so effectively. Actually, on the outer 2 or 3 is all that is needed to be spread out. The center of the machine feeds directly through and out the back without any windrowing. Only the outer edge is where the width is reduced and non-drying windrows made. Having the outer two at a slight angle to each other may push the gathered windrow apart as it spreads it out toward full cutter bar width. You have to play with it a little for your mower and conditions.



Bruce McCuaig, Lancaster, Ontario put his own spreaders on to increase his swath to full cutterbar width.

Use tipped knives to get all the down material and have high coned drums that make multiple small windrows. The photo at right shows a mower making 4 small windrows instead of a true wide swath. Some disk mowers with tipped knives (to get the down material and suck up the dirt to mix in you forage) and high coned drums do a really poor job of laying it out wide. This inhibits drying. Our suggestion is to put a small V shaped diverter right where the lines of material from the paired drums comes out in a windrow, so it splits it back closer to the uniform true wide swath.



Lower the deflector shields to make a wide swath. While researching methods to successfully make same day haylage from red clover, we found that the heavy first cutting clover **impinged into a lump on the deflectors designed to make a wider swath**, and then dropped to the ground. The better the forage quality (less lignin) the tighter the lumps. Thus on some of our tests, the wide swath was thin material interspersed with basketball sized lumps of wet clover. This dramatically inhibited drying almost to the level of a non-wide swath windrow. Where we removed the shields to let the forage flow through and disperse unimpeded, the swath was uniform density, dried faster and more evenly.



Deflector shields on the mower cause non drying lumps to be formed. The better the forage (less lignin) the worse the lump.

I don't need to do that. There are a number of farmers who have mentally decided that this is not for them. Without a positive attitude, no new concept will “work”. Change is uncomfortable. This change creates upheaval in the machinery, timing, and labor to accomplish it. Often this six inch problem (between the ears) is too big and so they abandon any attempt. That is fine, there is no requirement to change. For some the 300 pounds of potential milk increase in every ton of haylage harvest, is not worth the effort. They may also be in areas where there are very cold nights, and the night is short (upper reaches of Canada) which greatly reduces or eliminates energy loss from respiration. For most who have switched to wide swath – same day haylage, the ability to get the forage cut today into storage today has been a huge benefit in reducing the amount of days from start to finish of the haylage. It significantly reduces the weather delay and risk. It also has allow them to get higher digestibility of the forage they make so they get more milk from every ton.

Grow heavy, high yielding crops. Heavy thick crop ie. winter triticale at >2 tons of dry matter per acre; 2nd year stand, first cut red clover are a challenge to get dry under many conditions. This is a nice problem to have – stands are so thick and yields so high that it takes more time to dry. This is where having a tedder in your back pocket can make all the difference. Yes, it is a second trip over the field but increasing feed value and not getting the crop rained on are worth the effort. For both triticale and heavy red clover, we found that tedding two hours after mowing made all the difference in drying rate. It got the bottom layers up and exposed to the sun. Of course, with a heavy crop you need to run the ground speed slower as tedders are not designed to handle that heavy volume of material. To fast a ground speed will make nondrying tedder lumps. The added benefit is that if your mower does not leave a wide swath, tedding shortly after mowing will correct the problem and allow you to have same day haylage.



3 to 5 tons of dry matter winter forage (triticale) crops have been a challenge to dry for haylage in a day. A tedder has been key to bringing up the lower layers and exposing them to the sun.

For farmers who wanted to make this work, same day haylage has had a huge impact on the speed and ultimate quality of the forage they harvested. Several have said it has done more for their profitably than any other change they made. Eliminating the above limits can make it work on your farm too.

Sincerely,

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