

GROWING THE RIGHT KIND OF ALFALFA HAY FOR DAIRY COWS

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The production of alfalfa hay with the objective of maintaining a high degree of quality means not only understanding what the factors are that contribute to quality, but having some idea of what the buyer, usually a dairyman, perceives a quality product to be. A discussion of quality will be largely concerned with the following items:

COLOR
LEAFINESS
MOISTURE CONTENT
CLEANLINESS
MATURITY
TIME OF YEAR HAY WAS PRODUCED

How we as producers try to meet the buyer's requirements and still try to maintain a profitable hay program is what I'll be discussing in this presentation.

The decisions influencing the production of quality hay begin long before the haying season. The farmer must be thinking about the kind of hay he wants to produce when he selects the land where he plans to seed the new crop. Fortunately, alfalfa has a wide range of adaptability, and while yield may be somewhat reduced on the heavier soil types, there is little excuse for failing to maintain high quality if attention is paid to proper procedures. Actually it seems that the dairymen who know their sources show a preference for hay from heavier soils. The finer-stemmed product has a better leaf/stem ratio than is possible from the lighter, higher yielding soils, resulting in a feed that simply produces more milk. Imperial Valley soils tend to be on the heavy side and no doubt this contributes to the reputation we enjoy as a source of good hay.

In selecting the land to plant alfalfa, certainly it is vital that this land be properly levelled for good water management. Good water management, combined with a good fertilizer program, is the key to a good, strong, vigorous stand ... and a good, strong, vigorous stand is your best and cheapest herbicide. And, speaking of herbicides, the farmer should know the weed history of this land. An infestation of puncture vine, or sandbur grass, is good reason to consider an alternate crop. Years of poor farming practices that have allowed weeds to proliferate should be followed by some years of good farming to clean up the land before making the heavy investment in establishing an alfalfa stand. In any case, even under any but the most ideal of circumstances, the prospective hay farmer should include a herbicide program in his land preparation to insure the cleanest possible stand. If the young seedling can grow in a proper environment, free from weed competition, it will develop into the kind of plant that will better withstand the abuses of the haying season, the adversity of the hot summer months, all the while tending to remain weed-free by shading out the competition. To insure that the alfalfa stand remains weed-free, one should consider seriously the use of a herbicide to inhibit the growth of summer grasses. Again, one needs to know his land to make this decision, and should consult with his PCA or the farm advisor. Timing is critical with these herbicides and I certainly advocate relying on the professionals in these matters.

Before we get into the mechanical aspects of hay production and their influence on quality, let me say a word or two about timing the cuttings. The farmer's desire to produce quality hay must be balanced against the need to maximize yield and longevity of stand life. Cutting hay at the 10% bud stage may produce great quality, but it is at the expense of yield and plant health. On the other hand, where production is the sole consideration then quality must be sacrificed. A happy compromise is to sacrifice a bit of yield and a bit of quality, yet retain enough of each to insure that the total result is hay of good quality from a strong stand that will last at least three or four years. How to accomplish this? I would recommend either a study of the literature or a session with your farm advisor for an explanation of the various stages of plant growth and their relationship to maturity. Our method is to watch the development of regrowth, and the bloom stage. Early in the season before the bloom period begins we wait until the regrowth is just reaching the height of the cutter-bar. Our cutter-bar is set low enough to cut all the hay without damaging the crown -- so we are talking about 2 to 2 1/2 inches of height of regrowth. Any less

is an indication of immaturity. Any higher results in injury to the new growth as well as possible increase in steminess of the hay. Later in the season as bud formation occurs we are then guided by both regrowth and bloom. Either one seems to be a good guide but it is helpful when one indication confirms the other. As a general observation, or rule-of-thumb, when regrowth has reached cutter-bar height, the plants are showing 10 to 20% bloom. As the season progresses to late summer then of course the bloom percentage goes up and quality goes down, but if the hay is otherwise clean, green, and leafy it is far more likely to find a ready market than hay that is grassy and bleached.

Now let us turn our attention to the mechanical process of producing top quality hay: We are starting with a crop of clean alfalfa that has reached the proper stage of growth, and we need to convert this into a product which will find a ready market at a price that will return a profit. At this point we must recognize that, having made the decision to cut, there is nothing we can do to improve or enhance the nutritional quality of the hay as it stands in the field. The process of producing baled hay is simply a method of getting the alfalfa to the cow in the most efficient and economical manner with the least loss of nutritional value. Indeed, once the haying process is started, all measures possible must be taken to insure minimal loss of quality. Many of these measures are obvious, and some not so obvious. I will try to cover as many as possible in the time available; at least those that I feel have the most to do with producing good hay. The cutting or swathing operation is simple and straightforward. A poorly adjusted machine may leave the hay in clumps which result in undercured masses which show up in the bale as slugs. A worn out or poorly adjusted crimper results in longer curing time. I have already mentioned cutter bar height, but I will repeat that I feel that it is essential that the sickle be set high enough to prevent crown damage.

The raking process is a good deal more involved and can make a tremendous difference in quality. Even the type of rake can make a difference, especially if one ignores the difference between the two basic types of rakes that are used. Briefly, the basket type is power driven, and the teeth may be set to lift the hay without touching the ground. With the teeth adjusted to the proper pitch angle, this rake will leave a fluffy windrow that can "breathe", or allow the passage of air. The second type is the wheel rake that derives its power by the teeth dragging on the ground at an angle which causes the wheel to turn and move the hay in the proper direction. This does two things; the windrow tends to be wound into a rope, especially if it is green or wet from dew, and it can't breathe, thus requiring longer curing time. Furthermore, the rake teeth dragging the ground are cleaning your field for you at the expense of the dairyman. Dirt clods, cow-pies, lost tools, and broken parts, and other assorted debris end up in the bale, and then are ingested by the cow to the distress of the dairyman. Of course, wheel rakes are simpler and more economical to operate and they have their place, but I advise close attention to their use to minimize their inherent problems.

As far as the management of the hay during the curing period is concerned, our objective should be to reach that critical point where baling can occur in the shortest time possible with the least loss of color and no danger of heating in the stack. My approach is to allow partial curing, at least a day or two depending on the time of year and the weather, before raking. Sometimes a further turning is necessary to assure uniform, rapid curing. Moving the hay allows air to pass through the windrow. This is what I referred to earlier as "breathing". You see, air is what dries the hay, not the sun. The sun bleaches the hay, but air dries the hay. True, the sun heats the air which helps dry the hay, but sun without air movement is not very effective. Remember: sun plus moisture plus time equals bleach. We can't do anything about the sun or the moisture but we can reduce the curing time with proper raking procedures. Reducing the time in the windrow will reduce bleaching and help maintain the bright color that the buyer prefers. Obviously the hay should be raked only when there is enough moisture present to prevent leaf shatter. Losing leaves not only reduces yield but also reduces quality and appearance. Since the raking operation is the least expensive of the various procedures in haymaking, yet is so critical, I strongly urge the investment in enough raking equipment to allow completion of the job in a minimum amount of time. For example, it takes about 9 to 10 hours to cut 70 to 75 acres with one swather. The field can be raked ready to bale in four hours using a set of double rakes that put two windrows together. With two sets of double rakes the job can be done in two hours which often times is about all the time that weather conditions permit. Sometimes not even that much, so it is essential to have enough equipment to insure a quality job in a minimum amount of time.

I've spent a lot of time talking about the raking operation compared to the swathing,

but I feel that this is the heart of the whole hay program. Hay is an expensive crop to plant; it is expensive to grow, harvest, and maintain, and it involves a lot of hard work and sleepless nights. Why undo all this expense and good effort by trying to save a little in the raking procedure when this is already the least expensive operation? The dairyman will show his appreciation for your extra effort through more dollars for your product.

Now for a few words about the baling operation. Basically we, as is customary, like to bale when the cured hay has absorbed enough moisture from the dew to prevent leaf loss or shatter. Bale weight is balanced between the needs of the trucker to make weight, and the dairyman's desire for a bale he can handle. We generally shoot for around 125 pounds, with little interest in the 140 to 150 pound range. The small amount of savings with the heavier weights is more than offset by the increased strain on the baler, and the added weight of the bale-wagon causing additional compaction. More important, I believe, are the adjustments of the feedfork and the adjustment and sharpness of the knives. The objective here is a well-formed bale with square edges and cleanly sheared ends. I believe that a bale of hay should look good as well as be good and this is possible with a little extra attention to proper maintenance. The result is better production from the baler, as well as a better product that has more eye-appeal. Please don't minimize the value of eye-appeal. Most dairymen want to see the goods they are paying top dollar for and perhaps a neat baling job may be the only difference between your hay and all the other loads in the yard.

Don't forget proper and uniform bale length, especially when there are two or more balers in the field. Long and short bales are troublesome to the truckers and make a bad impression on the dairyman.

Another concern during the baling operation is foreign material. We make a special point of picking up all loose wire, especially the little short pieces that come off the knoter during midnight repairs. I know that this is troublesome, but here again is the problem of this material falling into the bale then being ingested by the cow causing hardware disease. The same is true of shear bolts, old sprockets, pieces of roller chain, empty wire boxes, empty beer cans or bottles, and so on. I personally have great respect for the people who buy and feed my hay, and I have no desire to use their cow's stomach as my garbage collector. Our operators are cautioned to collect all this stuff and dispose of it properly.

Now for a couple of hints on when to start baling. We like to start as the dew comes in, usually at night, at whatever the hour. We almost always bale in reverse of the cutting pattern. That is to say, the last cut is the first baled...because that is where the hay is ready first. There may be as much as 10 hours difference in time of cutting from start to finish in a particular field and it follows that the later cut portion of the field will be fresher and the ground will have more moisture and it seems only logical that this is where the hay will soften first. As baling proceeds, the drier hay will be picking up moisture, and by the time the field is completed the dry end is about as moist as the fresh end. We like to bale with around 13 to 14% as measured by a Delmhorst moisture probe. When average moisture in the bale exceeds 15% we prefer to delay further baling until the next night. We almost never try to continue after daylight when the hay dries down. The leaves are the first to dry and the hay has a "raggy" feel. The bales may be excessively heavy, or soggy, and have a bad appearance. I feel it is much better to watch the hay carefully in order to get an immediate start when it is ready, then move rapidly to complete the job while the moisture level is still in an acceptable range.

To quickly summarize: the key indicators of high quality hay are: bright green color, leafiness, cleanliness, moisture content, maturity, and time of year the hay was produced.

Land preparation, water management, and fertilizer are essential to good clean growth. A good herbicide program will help keep a clean stand. Careful attention to stage of growth before cutting will maximize yield, quality, and life of the stand. Care in the mechanical handling of the hay will minimize the loss of nutrients and help maintain the quality and appearance of the hay. The raking operation is the heart of the whole program and requires careful supervision. The bale is the final package. When done with care and proper timing, the farmer has the opportunity to present his product with pride.