



ADVANCED AG SYSTEMS'S

# Crop Soil News

<http://www.advancedagsys.com/>

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

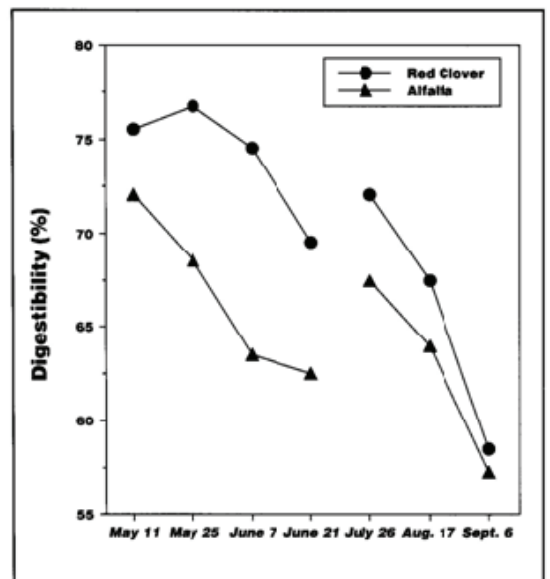
## The Ugly Duckling Forage

Red clover has the reputation of an ugly duckling. "Isn't that the wet slop we quit growing a number of years ago?" Unfortunately, because of this attitude, many farms are attempting to grow alfalfa on ground that will not support alfalfa. The stands only last 1 – 2 years before they thin to less than 50% legume and expensive nitrogen additions are needed to keep the field productive (note: I did not say profitable).

This is the kind of ground that clover will thrive on. Yield data from the Cornell Forage Research Trials show red clover producing equal to alfalfa – on alfalfa soils (note 2010 was very dry year). The seeding year also produces very high yields. Utilizing the triple crop system described in the July Crop Soil News (<http://www.advancedagsys.com/wp-content/uploads/2010/08/July-2010-email.pdf>), the clover can be planted with the winter triticale the previous fall. This saves time and work in the spring when the soils are often too wet to work. Because you planted the previous fall, you do not have a seeding year slump as you get 2-3+ tons of very high quality dry matter from the triticale, plus 2 -3+ cuttings of fully established red clover the same year. The second year the stand is at peak production. By the third year, clover root curculio and clover crown borer have weakened the stand. You get a good first cut and then can directly plant a short season corn. Because it is first year corn, you only need starter nitrogen as the clover crop will supply all the nitrogen needs of the corn. As it is first year corn, it will yield 15 – 20% higher than corn following corn. Both of these factors produce very inexpensive forage that can out-compete purchased concentrate in a high forage diet.

Clover has major advantages in the high forage (>65%) diets of high producing dairy cows. As you can see by the graph at the right from **Wisconsin** research, clover actually has higher feed value than alfalfa when harvested at the same time. It decreases in feed quality at the same rate as alfalfa but because it starts higher, could be harvested later and still be good (but not great) forage. This means it has more digestible components and so can support higher milk production on forage compared to alfalfa. This is critical for a high forage diet.

A more important factor is that clover contains polyphenol oxidase enzymes that inhibit protein breakdown in the silo. Red clover has more undegradable protein (bypass protein = 25-35%) than alfalfa (15-25%). This reduces or eliminates the need for more expensive purchased bypass protein. You can read more about this at <http://www.uwex.edu/ces/crops/uwforage/RedCloverCows.pdf>. High soluble protein from traditional haylage compared to wide swath haylage systems, is a major limit to the use of



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protein from legumes in high forage diets. This forage limiting problem of soluble protein becomes a non issue in clover as a forage and a protein source. Much more of the protein remains in the true form until digested in the cow. A third factor the Agricultural Research Service found is the presence of a compound that inhibits hyper-ammonia producing rumen bacteria from breaking down and producing ammonia from amino acids. This compound is present in hops. It is also present in red clover. Thus the protein can be used directly by the forage digesters and the cow, rather than being converted to ammonia with a loss of energy.

### Red clover as high quality haycrop silage or wet slop?

Two critical steps in the use of red clover are: **A**, you **MUST** use wide swath same day haylage; and **B**: if you want to make red clover dry hay, grow something else.

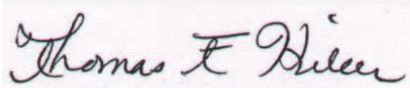
Those who have switched to the extremely profitable **Wide Swath – Same Day Haylage** (see May Newsletter in web site); already know that the key to rapid dry down is to have ALL the leaves exposed to the sun. Conditioning is not needed and actually can be counter-productive for the early dry down stage that encompasses haylage. For Red Clover, the massive leaves means the crop dries extremely fast down to 60 – 65% moisture. As alfalfa leaves dry, they tend to curl and so the sun can hit the next layer under and dry that also. The massive clover leaves dry flat as a sheet of paper, and 1/16 of an inch under the top leaf the forage is as green as you mowed it because of the shading effect. You can see this effect in graph #2 which is the dry down rate of first cut red clover and first cut alfalfa cut with a swath of 95% of cutterbar width, and no conditioning (sidebar sickle mower). Both crops dry at the same rate until about 75% moisture; at which point the alfalfa leaves on top start to roll and the clover remains flat. Thus the clover dries slower. If the crop is tedded at that point (the leaves are still wet and in wide swath haylage, leaves are last to dry so they don't shatter) the bottom layers of red clover are brought to the surface and exposed to the sun. The resulting photosynthesis rapidly dries the forage as can be seen in graph #3 where it was **tedded at hour 4**. Both the participating farmer and myself were stunned by just how **fast the clover dried in one half of an hour**. The heavy first cutting alfalfa and clover were ready to chop in 4.5 hours after mowing. Tedding earlier may have shorten this time even more.

Yes, you can mow it into a less than 85% of cutter bar swath; condition it with tine conditioners to remove most of the leaves; and let it sit for several days while the sugars and starch necessary for quick fermentation and high milk production are burnt off and the crop smells like old socks – but then why bother growing clover.

#### The Bottom Line:

Red clover is a very high quality haylage that can support very high forage diets. It fits in crop rotation systems that can significantly increase the forage yield from less than ideal drained soils. It needs to be harvest as haylage in a wide swath and tedded system.

Sincerely,



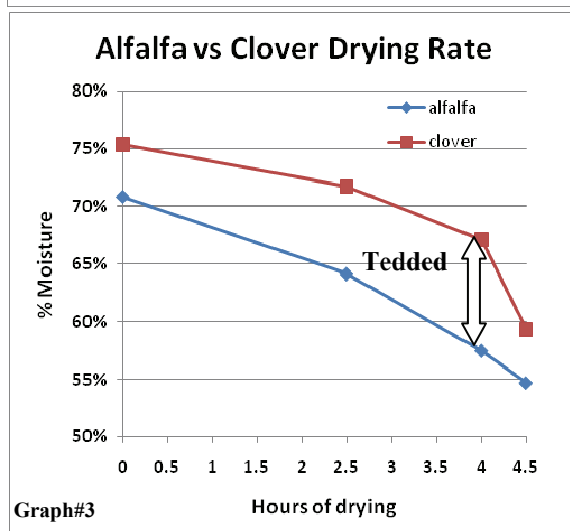
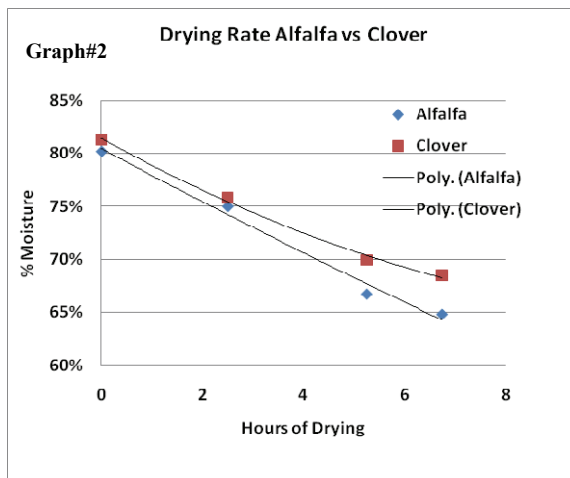
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**Graph#3**

Hours of drying