

Viewpoint

Forage Good Enough for Cattle Production: When!

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The longest running promise in the South is probably having forage quality high enough to fatten beef cattle. We keep hearing about these new varieties, legumes and management techniques but the forage never quite makes it as good as we hope. Without reviewing in detail factors that influence forage quality, and actually digestibility, suffice it to conclude that all forage plants in early stages of growth have high digestibility and forage produced early will fatten cattle. By the same biology, forage on these same forage plants later in the year usually has long periods of low quality when cattle don't gain or may even lose weight. In the South, with its long growing season, low forage quality may persist for many weeks. We want and need to increase the length of time when we have high quality forage. Nation-wide we want to maintain spring-like forage all summer long. Then we can grow and fatten cattle all season long.

Perennial forage grasses usually are made up of three parts (1) green leaves, (2) dead leaves, and (3) stems. In the spring these grasses are almost entirely green leaf, and digestibility will be above 65%. In the case of winter grazing crops such as wheat, oats, and ryegrass digestibility of leaves may be 80% or higher (Kilcher and Troelsen (a) 1973).

Grass leaves live 60 to 80 days before being replaced by young leaves and then the old leaves die. At time of leaf death soluble energy and protein contained in the old leaves are translocated out to roots, new leaves, or stems and the dead leaf becomes a fibrous residue. The digestibility of the dead leaf is usually under 45%. Shortly after the leaf dies, molds, fungi, bacteria, and leaching strip the energy and protein further. When grazed by cows, dead forage may even require an outside energy input to digest it (doesn't contain enough energy to digest itself). Green leaves are energy accumulators and at leaf death they become energy dissipators. The end product of leaf energy loss is soil organic matter. Thus at any specific time a dead leaf may contain a large number of decomposition products. It is suspected that a number of the N-containing intermediate decomposition products are toxic. A forage such as tall fescue, where dead leaves contain up to 2% N, could contain substantial amounts of these toxic nitrogenous residues.

Green leaf death in late spring and summer is usually caused by shading of mature leaves by young leaves, old age, N transfer, dry weather, or seedhead production. When the seedheads start to grow, the mature leaves are sacrificed to get the energy to grow them. Consequently when seedheads appear, stems and dead leaves accumulate rapidly and forage digestibility decreases. The mature stems are only 35% digestible, far too low to fatten cattle (Kilcher and Troelsen (b) 1973).

We know that when seedheads appear on rye, wheat, or ryegrass grown for grazing, animal gains are over and it is about time to remove the cattle. We now know that soon after the seedheads appear the bottom leaves will be dead and in 30 days all leaves will be dead. Digestibility of the forage can decrease from 75% to 35% in 2 weeks. Dead rye, wheat, or ryegrass forage won't fatten cattle any better than dead fescue, Bahiagrass, or Bermudagrass. The leaves die faster during a drouth. Leaves in perennial grasses die of shading, old age, or stem production as in annuals except that the top leaves are almost always green. We don't see the bottom leaves that are dead. They are there, we just don't look for them.

Young cattle grazed for rapid growth and dairy cows require a ration that is 70% or higher in digestibility. Corn and cob meal with a protein supplement will be approximately 73 to 75% digestible on dry matter basis as is well-eared corn silage and both are good cow feed. Green grass leaves at 65 to 70% digestible are just barely digestible enough to produce rapid gains and milk but stems and dead leaves are too low in digestibility to produce much of either.

High producing dairy cows generally require feeds even higher in digestibility than do growing beef cattle. Dry beef cows can winter on forage that is 45 to 50% digestible. Heifers intended for breeding usually need to grow fast and need a pasture that is digestible enough to grow steers.

In short the only forage grass adequate to produce rapid gains on growing beef cattle or produce milk in dairy cows is green leaves. To check the quality of the forage in a pasture, cut a handful of the taller forage to a height of 1/2 inch, separate the sample into green leaves, dead leaves, and stems and using digestibilities mentioned earlier (70%, 45%, 35%, respectively) compute digestibility of the sample. If the digestibility is 65% or higher it will be green leaf and is an excellent pasture. If the digestibility is below 50% young cattle will lose weight and dairy cattle should not be allowed to graze it.

A pasture starts off in the spring with all shoots covered with green leaves. Before long old leaves are shaded by young leaves and die, or seedheads are produced and leaves die. We may run into dry weather in May or June and 50% of the leaves die. In the South after early spring, it appears that about all the forage in a pasture wants to do is die and over a 300-day grazing period two-thirds of it does. Unless the dead leaves and stems are removed, the value of the pasture decreases as the amount of dead forage increases. The decrease in forage quality as the summer advances is due primarily to a management that does not remove the stems and dead leaves. Correcting that management deficiency will greatly improve forage quality in summer and fall.

In the past we thought pasture management consisted of applying fertilizer and mowing weeds and seedheads. We now know that a pasture that starts out green leaves in the spring may be 60% green leaf in July and 25% green leaves in September. Successful pasture management in the future must involve maintaining green leaves long, and that requires different pasture treatments.

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Pasture management and cattle production in the South have made progress. By the time we include management factors which will keep forage digestibility above 65% season long, we will begin to benefit from our natural climatic advantages.

Our cattle producers will be on the right track when they expect forage management that produces a forage with a minimum of 60% digestibility. In 10 years the management should be available to produce a 70% digestible pasture.

We know now that southern forage with appropriate management will grow cattle. The mystery of why we couldn't grow young cattle is not such a mystery any more. In the past we were too busy growing pounds of dry forage (brag yields) and completing some visual color rating or rather meaningless chemical analysis and calling it forage evaluation. Our producing cattle need primarily digestible energy and we now know that we can produce a forage 50 to 70% higher in digestibility than is presently being grazed.

There are a few other popular ideas we need to replace. The concept that dead grass in a pasture is a hay reserve is misleading. It isn't; it is a plant waste product and digestible nutrients have been removed. Cattle forced to eat it will lose weight.

A pretty pasture isn't necessarily a productive pasture. Mowing makes a pasture look better by topping weeds, but low quality forage remains concentrated in the bottom 4 inches. Mowing at a height of 3 to 5 inches doesn't improve digestibility of the forage left. Pasture mowing as now done is rather cosmetic and is getting to be expensive. Properly done it can be a useful tool.

Most pastures that are high in digestibility will have a number of species in it. A pasture where one species dominates is usually low in digestibility. A pasture thick enough to shade out competition will be thick enough to shade itself out at the same time. An accumulation of dead grass parts shades out young clover and annual grass seedlings. The bottom leaves are also shaded. If we

prevent the dead grass from accumulating, it will be much easier to get the clover and grasses in and keep the bottom leaves green.

Once we lose green leaves in a pasture, usually 30 days or more will be required to grow the next crop. From a management viewpoint, keeping green leaves requires that management anticipates forage quality changes at least 30 days ahead. If we see the need, we missed the best time and can now either feed our cattle grain or allow them to gain weight slowly.

The single factor that will improve the economics of the cattle industry in the South most is a pasture management program that maintains high forage digestibility season-long and produces fast gains. We now have the know-how to produce such forage with most forage species. Making the change to high forage quality won't be easy. Change never is easy. We have every reason to believe that emphasizing high forage quality will produce better cattle much cheaper.

When will the change to better pasture management come? It depends upon when the manager wants it. We have the know-how now. Many, however, want to hold on to the old ways and don't understand that cattle production is half nutrition. Up to 10 years may be required for wide acceptance of the need for forage production to meet cattle nutritional needs rather than to have forage for cows to walk around in.

Literature Cited

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