GUEST COLUMN

Managing Harvest Equipment to Minimize Leaf & Yield Loss

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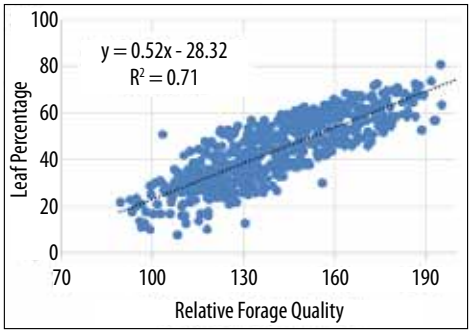
Harvest management can have a huge effect on yield and quality of harvested alfalfa. Leaf loss can result in dry matter yield loss of 10-15% during harvesting. Leaves have a Relative Forage Quality (RFQ) of ~500 while stems have an RFQ of 70-80. Thus, if we want quality forage, we must focus on harvesting leaves. A study of four rake types in three states showed leaf percentage accounted for 71% of variation in forage quality (Figure 1) – more important than maturity or any other factor!

Figure 1. Effect of leaf percentage on RFQ.



So, if harvested forage has significantly less than 50% leaves, analyze each harvesting process step to determine where loss is occurring; then choose methods to reduce loss.

1) Evaluate alfalfa stands to determine if many leaves fell to the ground prior to mowing. First evaluate if leaf disease was present; if so, a fungicide may be beneficial (evaluate carefully as fungicide is an expense that may not be needed). Determine if all varieties showed the same leaf loss – some varieties have more leaf disease resistance than others and should be considered for future planting.

2) Check after mowing and conditioning. Generally, small leaf loss is seen at this stage, but keep in mind:

a. A flail/impeller conditioner will result in increased alfalfa leaf loss compared to a roller conditioner or no conditioner.
b. Placing alfalfa into a wide swath after mowing will enhance drying rate and reduce non-fiberous carbohydrate (NFC) loss. NFC is 98% digestible to animals. The loss also results in a drop of RFQ. For larger operations, triple mowers are recommended rather than self-propelled mowers since they only make windrows narrow enough to fit between the wheels. When windrows are less than 70% of the cut area, forage yield loss from respiration during drying may be up to 8% of dry matter. Additionally, slower drying and delayed hay removal can significantly reduce next cutting yield (due to driving over regrowth and, possibly, delayed irrigation).

3) Consider that leaf loss occurs every time you move forage prior to harvest.

a. Try to rake/merge only, as each operation results in additional leaf loss (e.g., tedding, windrow inverting).
b. Wetter forage results in less leaf loss when moved. So rake/merge at >40% moisture if possible.
c. Rolling forage across the ground results in leaf loss.
   i. Reduce distance moved by raking to the middle, rather than to one side.
   ii. Mergers result in less leaf loss than rakes since they pick up forage and move it on a conveyer belt.
d. A recommended procedure would be to mow, place alfalfa into a swath covering 70% or more of the cut area, rake/merge at 40-60% moisture, and harvest. In the Midwest and Northeast, haylage made with wide swaths can often be harvested the same day it is cut.

4) Minimize leaf loss during harvest.

a. Harvesting windrows near baler or chopper capacity is more fuel- and labor-efficient.
b. Larger windrows result in less leaf loss at baler or chopper pickup during harvest.
c. Look behind the harvester – is there a layer of leaves falling behind the baler or a green cloud around the chopper wagon? Each of these are signs of leaf loss resulting in reduced harvested forage yield and quality.
d. Yield and quality losses can be reduced by harvesting dried hay overnight or in the early morning with dew. This approach may also be beneficial for harvesting haylage.

Standing alfalfa will normally have ~45-55% leaves at the bud stage. Leaf loss cannot be eliminated; it can, however, be minimized. By paying attention to "harvesting leaves" rather than "harvesting hay," you can observe where leaf loss is occurring in your operation and take steps to reduce losses. In some cases, different machinery may be called for but, in most cases, equipment adjustment and timing of use may significantly reduce leaf loss.