



# Managing the yield and quality trade-off

**Y**IELD versus quality: What is more important? Which is easier to comprehend?

When interacting and facilitating discussions during forage planning meetings, the conversations regarding yield and quality are fascinating. The industry influencers at the table (agronomists, growers, dairy owners, beef owners, harvest crew managers, and nutritionists) often understand or rank them differently. Yet, we often come to the realization that the entire team has similar goals. Typically, the entire forage harvest and management team aim for the dairy or feedlot to be as profitable as possible.

So, what drives farm profitability?

Yield or quality?

Additional yield tends to bring more dollars per acre but often comes at a detriment to quality and cattle performance in terms of milk or meat. Thus, how do we define profitability? The answer lies in assigning a dollar value to the yield and quality, then balancing these to find the optimum economic return per acre.

## Valuing yield

Dry hay yield is relatively easy to quantify and value, but Midwestern and Eastern farms harvest silage, where yield value and forage contracts should be based upon dry tons. Determining dry matter tons can get confusing. Spend time planning to accurately

determine both wet tons harvested and moisture concentrations to appropriately value total yield. Wet tons can be determined using a drive-over scale or through volumetric estimates of the storage structure or forage wagon. When determining moisture content, develop a moisture sampling protocol.

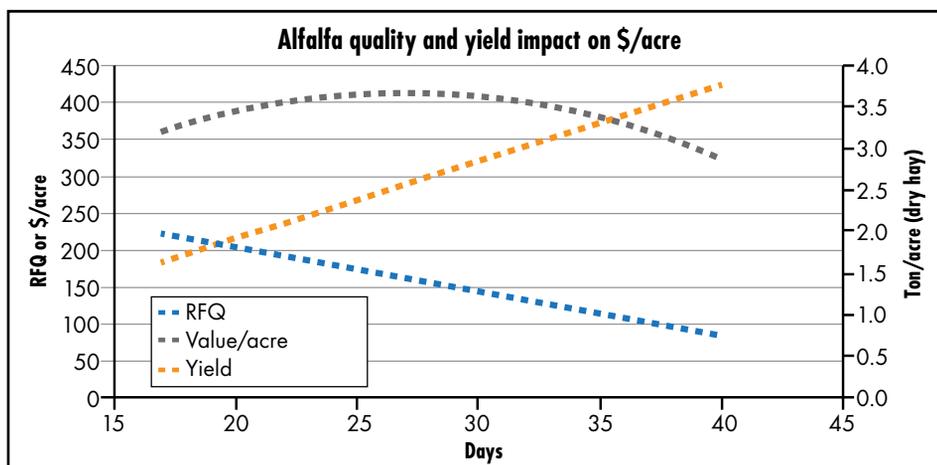
During harvest, record loads per field, then gather enough moisture measurements to accurately determine field moisture content. For fields that are 25 acres or larger, plan to sample from at least two or three loads, or consider making one moisture sample for every 10 acres. For each load sampled, take three to five subsamples into a 5-gallon bucket from the load after it has been dumped. Keep safety in mind and stay clear from power takeoffs or moving equipment.

Thoroughly mix the three to five subsamples with a hand-scooping, turnover technique (like a TMR mixer), and then scoop out two or three small samples from this mix for the moisture measure. Be careful not to use a “hand grab” technique, as this can leave grain and fines behind. The moisture sampling protocol may seem challenging and tedious, but this effort is critical to determining yield value.

## Valuing quality

Forage quality should be valued based upon the market hay price or milk value per ton of forage. In both cases, quality generally depends on two characteristics: nutrient content and nutrient digestibility. More fiber dilutes out energy value, and greater starch, sugar, and protein improve forage energy value and quality. Fiber is negative while protein, starch, or sugar are positive in energy terms because fiber digestibility (or energy value per pound) is always less than that of starch, sugar, or protein. Fiber digestibility through high-producing dairy cows averages around 40 to 50 percent whereas protein, sugar, and starch average 90 percent digestibility or greater!

Top-notch dairy quality corn silage and alfalfa haylage or hay will have less than



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40 percent fiber. Exceptional grass, small grain, or sorghum silages will have less than 50 percent fiber. To achieve lower fiber crops, select the best seed genetics and manage aggressively. Determine your harvest timeline based upon plant and grain maturity rather than the calendar. At times, a hay crop may be ready to harvest in less than 28 days.

With corn silage, cutting at 12 to 18 inches above the ground will increase the grain to stover ratio (less fiber). For further considerations in high-cutting corn silage, please reference the "Taking corn silage to new heights" article in the August 2016 issue of *Hay & Forage Grower*.

While less fiber is generally better, fiber and starch digestibility have also received considerable attention, and rightly so. Environment has a profound impact upon fiber and starch digestibility. Sometimes planting the best seed or implementing the most aggressive management practices yield less than desirable results. But rest assured that genetics and management will still influence digestibility.

Within corn silage, fiber content and digestibility have been estimated to be 50 percent heritable, meaning selecting the right seed can pay off. Management of the crop for less fiber, as discussed above, also tends to improve fiber digestibility. Cutting earlier for legumes and grasses, or cutting silage at a greater height above the ground, will also boost digestibility.

So, why wouldn't we seek to optimize forage quality? Unfortunately, quality typically comes at the expense of yield or stand life. Cutting earlier or higher off the ground typically equates to less tonnage. The best means to balance yield and quality is striving for maximum milk harvested per acre.

### Finding a balance

Yield and quality should be balanced to harvest the greatest economic return per acre (milk per acre or dollars per acre). For alfalfa or grasses, consider the relationships shown in the figure. Here the value of dry hay was determined as \$1 per point of relative forage quality (RFQ) per ton. Meanwhile, the yield gain per day is set at 160 pounds of dry matter and the RFQ declines at 5 points per day. In this example, the optimum economic return appears to be less than 30 days. Use this example to help make your own projections to hold this optimal balance.

For corn silage, build test plots into your or your clients' crop management plan and test the impact both hybrid

choice and cutting height can have on yield and quality. Weigh the plot loads or samples for yield estimates and then send representative samples to your forage testing laboratory for quality measures, including digestibility.

Combining yield and quality results into milk per acre estimates can then assist in choosing which cutting height makes sense for the operation in question. Finally, compile your results along with university plot results and seed representative recommendations to

make educated decisions with the next year's seed corn purchase.

Working with your nutrition and crop management team can improve your dollar-per-acre projections as you strive to balance yield and quality. Expand on quantifying dry matter yield using some of the tips offered here and work to better assign a milk value per ton. Integrating these two management schemes can then help you balance the forage teeter-totter and your checkbook, bringing home optimum economic return per acre. ●

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