

Analyzing cultivar performance utilizing both yield and quality factors

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Yield performance, stand persistence, disease resistance and forage quality are important criteria for variety selection. The use of yield as the primary criteria for variety selection is usually justified, given the large impact of yield on profitability. Yield potential integrates many factors, including stand persistence and disease resistance. However, forage quality factors have become much more important in recent years—we estimate over \$300 million in value is ascribed to quality factors in California alone. Yield and quality are negatively correlated in practice, and optimum profitability rarely occurs at maximum yield or maximum quality, complicating variety selection.

Fall dormancy (FD) has a large effect on both yield and quality of alfalfa. Yield was increased between 0.4 to 0.6 tons/acre DM per unit of FD rating in UC Davis trials. Quality factors (CP, ADF, and NDF) were also influenced by FD score but with more variation in the relationship. Time of year (cutting) and specific varieties are important sources of variation in addition to FD.

Analysis of the yield-quality tradeoff of alfalfa is fundamental to this question. Varieties claimed as ‘high quality’ may also be lower in yield, resulting in overall reduced returns. While it is important to judge yield potential over years, quality differences may only be apparent in only one or two harvests—differences which nevertheless may be important to growers.

Generalizing the average relationship between alfalfa FD and yield and quality enables these factors to be analyzed economically, and allows the use of FD score as a guide for rational variety decisions. But more interesting are varieties which exhibit ‘exceptions to the rule’, for example, lower-than expected fiber values at high yield levels. It seems axiomatic that forage quality potential of alfalfa varieties should not be viewed in isolation from yield potential. Analysis of data from Davis has shown varieties which exhibit quality traits sufficient to alter forage quality several marketing categories at the same cutting schedule—in some cases with substantial yield penalties, in other cases not. Integration of yield and quality factors as selection criteria are a challenge for breeders and agronomists. However, consideration of quality factors necessitates an integrated approach, and forage quality factors are likely to become more important in the future.

