Feeding BMR Corn Silage

Corn silage is very popular in the Northeast, although the escalating price of corn grain has increased the proportion of NY State's corn crop that is harvested as grain. A variety of traits are being promoted for high milk production through improved forage quality.

Because of high farm land costs and sometimes limited land availability, dairymen are faced with the challenge of harvesting the most milk production per acre of land. Digestible fiber is seen as increasingly important for its potential impact on DMI and milk production. Two traits considered to improve fiber digestibility are the leafy and brown midrib traits.

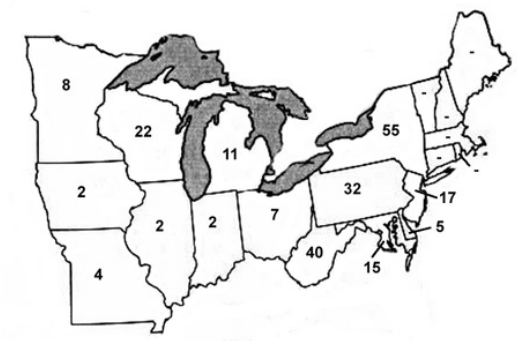

Figure 1. Percentage of corn land harvested as silage (NASS statistics, 2003). Data is not collected in some states.

A long history of brown mid rib (BMR) feeding trials vs. normal counterparts for corn and sorghums has resulted in inconclusive findings. Decreased DM yield (15-20%), despite improvements in fiber digestibility, resulted in generally unsatisfactory BMR performance in the past. Newer BMR hybrids continue to increase in yield potential, now only about 8% lower than conventional hybrids.

Feeding Trial

Eight corn silage hybrids were grown at the Teaching and Research Center located near Harford, NY and harvested at a DM of about 34% in mid-September 2002. Four of these hybrids selected for a range in fiber digestibilities were used in the feeding trial: a leafy hybrid (Mycogen TMF 100), a brown-midrib (Mycogen BMR F407), and two hybrids with a range in fiber digestibilities (Pioneer 36B08 and Pioneer 35P12).

Table 1. Ingredients in corn silage TMRs, as a percentage of the total ration.

Ration component	Mycogen F407BMR	Pioneer 35P12	Mycogen TMF 100	Pioneer 36B08
Corn silage	58	58	50	54
Alfalfa silage	9	9	9	9
Wheat straw	1	1	1	1
High moist. corn	7	6	13	10
SBM	22	22	23	22
Vit./Min. other	3	4	4	4

Diets were formulated to provide 1.05% of BW as forage NDF (approximately 31% NDF). Diets were balanced to meet or exceed requirements for NRC requirements. In addition to corn silage, alfalfa silage, wheat straw, high-moisture corn, soybean meal (SBM), soy hulls, urea, and a mineral-vitamin mix were used. Diets were formulated using CNCPS v5.25. Dry matter intake was targeted to be 48.5 lbs per day for cows in mid-lactation producing about 85 lbs of milk per day.

The four TMR were formulated to be similar in chemical composition and predicted daily milk. This resulted in lower forage in the ration for TMF 100 and Pioneer 36B08. Alfalfa silage was included at a constant 9.3% of the ration, so lower forage in the rations was accomplished through reductions in the corn silage in the ration. High moisture corn accounted for the majority of the increase in concentrate.

Table 2. Corn silage (CS) composition and diet dry matter intake (DMI) and milk yield.

	Mycogen F407BMR	Pioneer 35P12	Mycogen TMF 100	Pioneer 36B08
CS NDF	40	44	45	45
CS NDFD	75	65	61	57
CS pH	3.7	3.7	3.7	3.6
DMI, lbs/day	50	46	50	48
Milk, lbs/day	92	86	93	86

Feeding Trial Results

Daily milk production was higher for cows fed leafy hybrid TMR than for those fed either of the normal hybrid (35P12 and 36B08) TMRs, and milk production of BMR tended to be higher than for normal hybrid TMR (Table 2). There was an effect of day, but in general cows fed the normal TMR did not produce as much milk as those fed the BMR and leafy hybrids.

Dry matter intake generally followed milk production, and likely accounted for some of the differences observed in milk production. As with milk production, cows fed BMR and leafy hybrids had generally higher intakes than those fed normal TMR.

Higher DM intake can result from higher digestibility, higher rate of digestion, and/or higher rate of passage. In our study, the BMR silage had higher in vitro true digestibility (IVTD) than the other hybrids at all time points measured. The leafy hybrid tended to be higher in IVTD than the normal hybrids, but was generally lower than BMR silage.

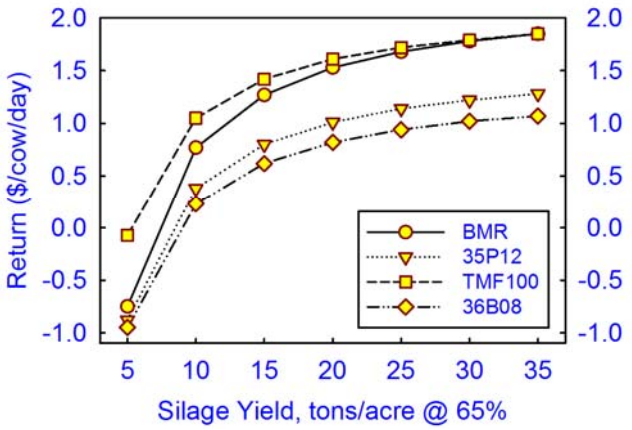

Figure 2. Influence of corn hybrid and yield on economic return.

BMR silage had the highest digestible NDF (NDFD) from 30 h on. Because DMI was as high or higher by cows fed the leafy hybrid as those fed BMR, differences in NDFD did not account for all differences in DM intake. DMI of the leafy hybrid diet was positively influenced by having twice as much corn grain in the diet than with BMR.

Economics

Silage yield strongly impacts returns, and higher seed cost of BMR becomes important when yield drops below 15 tons/acre, as seen by the more rapid drop in BMR returns below that yield level (Fig. 2). On the other hand, corn silage yields much below 15 tons/acre will be difficult to justify economically.

Summary

Hybrids selected for improved forage quality traits, such as BMR and LEAFY, should result in more cow DMI and milk production. Improved forage quality is not without cost, however. BMR hybrids typically produce lower yields than normal hybrids, and more challenging to harvest, especially if there has been lodging or dry-down problems at harvest. BMR hybrids typically require a segregated bunker silo for ease of feeding. Greater seed costs also are generally associated with improved hybrids, but seed cost will impact returns only at low yields. Dairymen must evaluate the benefits and risks associated with improved forage quality varieties.

Additional Resources

- 2011 Cornell Guide for Integrated Field Crops Management. Electronically accessible at: http://ipmguidelines.org/Fieldcrops/.
- Cherney, D.J.R., J.H. Cherney, L.E. Chase, and W.J. Cox. 2004. Milk production in Holstein cows as influenced by corn silage quality differences. Prof. Anim. Sci. 20:302-311.
- Cox, W. J, and D.J.R. Cherney. 2001. Influence of brown midrib, leafy, and transgenic hybrids on corn forage production. Agron J. 93: 790-796.

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