Four Keys to Improved Forage Management with Silage Hybrids

by Dan Gard and John Osthus, Monsanto Dairy

Monsanto Dairy has a new forage nutrition program that helps producers get better control over four key opportunities to maximize milk production, increase profits and reduce environmental impact. With the launch of the SEED to FEED^{sm} forage nutrition initiative, Monsanto will help producers manage these important aspects in their corn silage operations.

Seed Selection – Proper selection of forage hybrids can lead to superior forage yield and quality. MILK2000 estimates silage DMI and NEL values using CP, NDF, fat, starch and sugar, plus organic acid fractions, along with cell wall digestibility. It is a good resource to aid you in your hybrid selection (www.uwex.edu/ces/crops/uwforage/Milk2000silage.html).

Easier Weed and Insect Control – Use of herbicide-tolerant and pest-resistant varieties makes weed and insect control easier and improves the agronomic yield of corn silage.

Harvest and Storage Management – Improved silage hybrids will only provide a nutritional advantage to cows if harvested at the proper moisture and maturity and stored under conditions that promote normal fermentation. For example, harvesting corn silage above 70% or below 60% moisture can increase DM losses during storage by 5-10% over corn silage harvested between 61 and 69% moisture.

Larger Profits, Reduced Environmental Impact – This is possible through traits that facilitate use of conservation tillage practices and traits that produce in-plant insect protection. Conservation tillage has well-documented environmental benefits, all of which are inextricably linked to economic benefits that result from reducing tillage. Hybrids can help preserve soil, protect water quality and decrease costs for labor and machinery compared to conventional weed and insect control programs.

Monsanto offers expertise on harvest and storage techniques that deliver optimal forage qualities via a nationwide network of sales and technical service professionals. The Monsanto team works in partnership with nutritionists and other on-farm advisors. For more information on the new SEED to FEED^{sm} forage nutrition initiative, call Monsanto Dairy at 1-800-233-2999 or, email Monsanto at team.monsanto.dairy@monsanto.com.

Determining Bunker Feedout Rate –

Now that the corn silage or haylage is in the bunker, it's time to think about maximizing economic return through good feedout practices. Feedout rates are fairly simple to calculate. All you need are three pieces of information: 1) silage density, 2) silage face area (height x width) and 3) pounds of silage fed per day.

Worksheet:

A) Silage Density = _____
(lbs of DM/ft^3, haylage apx. 15, corn silage apx. 13-15)

B) Silage Face Area =_____
(ft^2, average silage face height x average silage width)

C) Silage Fed/Day =_____
(lbs of DM taken out of silo/day)

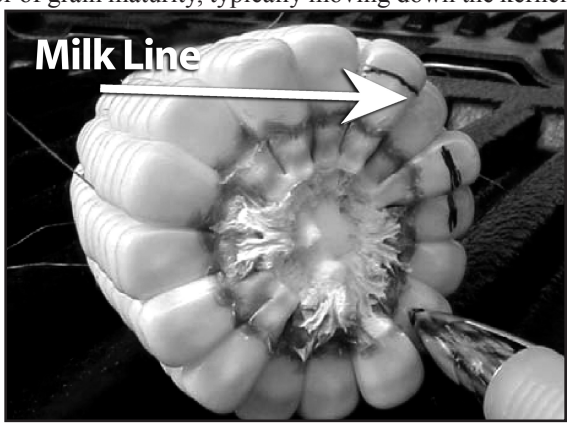
Example*:*
2,000 lbs of haylage DM fed/day; 30'x8' silage face (240 ft^2).
Feed Out Rate =
(12 x 2,000) / (15 x 240) = 24,000 /3,600 = 6.67 inches/day

You can use "as fed" weights instead of dry matter weights for A and C — but both must be the same unit of measure. What should your feedout rate be? Most studies with corn silage or haylage in small to medium-sized bunkers find that silos fed out slower than 5"/day had higher DM losses. Silos fed out faster than 5"/per day average 10 % or less total DM loss!

Watch the Milk Line to "Trigger" the Start of Corn Silage Harvest

by Jeff Hinen, Monsanto Dairy

The "milk line" is the divide between the milky sugars in the maturing kernel and the starch, which is the storage form of those sugars. It is actually a weak relationship between the milk line stage of the corn grain and the whole plant moisture, which can vary as much as 25% at 1/2 milk line depending on the hybrid and the growing environment. Use the 1/3 milk line stage as a "trigger" to start checking whole plant moisture to determine the optimum timing for silage harvest. The milk line can be visually inspected by breaking an ear of corn in half with the ear tip in your right hand. View the portion in your right hand. Notice that the starch develops from the top of the kernel (at the dent) and progresses to the tip attached to the cob. The starch line is an indicator of grain maturity, typically moving down the kernel at about 1/4 of its length per week. Timing for whole plant moisture is critical for silage harvest and is best determined by taking plant samples, weighing them, then drying them in a Koster tester or microwave, and then weighing them again to determine total moisture. If the corn is chopped too wet, it will go through poor fermentation and the added moisture will enhance the seepage of valuable nutrients from the bunker. If the corn is harvested too dry, fermentation will be inconsistent, which promotes more mold development, less digestible grain and fiber, and poor bunklife. Optimum nutritional quality is also achieved at or near 1/2 milk line. The following table shows the changes in nutritional quality as kernel maturity progresses. At or near the 1/2 milk line stage, the whole plant yield nears its maximum and does not increase significantly beyond this maturity. As the plant matures past the 1/2 milk line stage, fiber content increases and digestibility decreases, thus reducing the overall nutritional quality of silage and potential



Whole plant dry matter, crude protein, ADF, NDF, and digestibility for corn silage at five stages of kernel maturity.

Maturity Stage	**Dry Matter** *(%)*	**Yield** *ton/ac*	**CrudeProtein** *(%)*	**ADF** *(%)*	**NDF** *(%)*	**Digestibility** ***(in vitro)*** *(%)*
Soft dough	24	5.4	10.3	27.2	52.7	77.1
Early dent	27	5.6	9.9	24.3	48.0	79.0
1/2 milk line	**34**	**6.3**	**9.2**	**22.8**	**45.1**	**80.0**
3/4 milk line	37	6.4	8.9	23.8	47.3	79.6
No milk line	40	6.3	8.4	24.0	47.3	78.6

Source: University of Wisconsin

Figure 1. *Forage yield, moisture, NDFD, starch content, milk per ton, and milk per acre of corn harvested at Arlington during 1998 and 1999. The arrow indicates the average silking date of July 25. Derived from Darby and Lauer (2002).*