Should Brown Midrib Corn Silage be Managed Differently

Joe Lauer, University of Wisconsin

Some agronomists have recommended managing brown midrib (bmr) corn silage differently than other normal corn silage hybrids. Management decisions involving plant density, row spacing, planting date, and cutting height were investigated between these hybrid types beginning in 2009. The findings showed that no interactions between management practices and hybrid type were found. In other words, what one does for normal corn silage, one should also do for bmr corn silage.

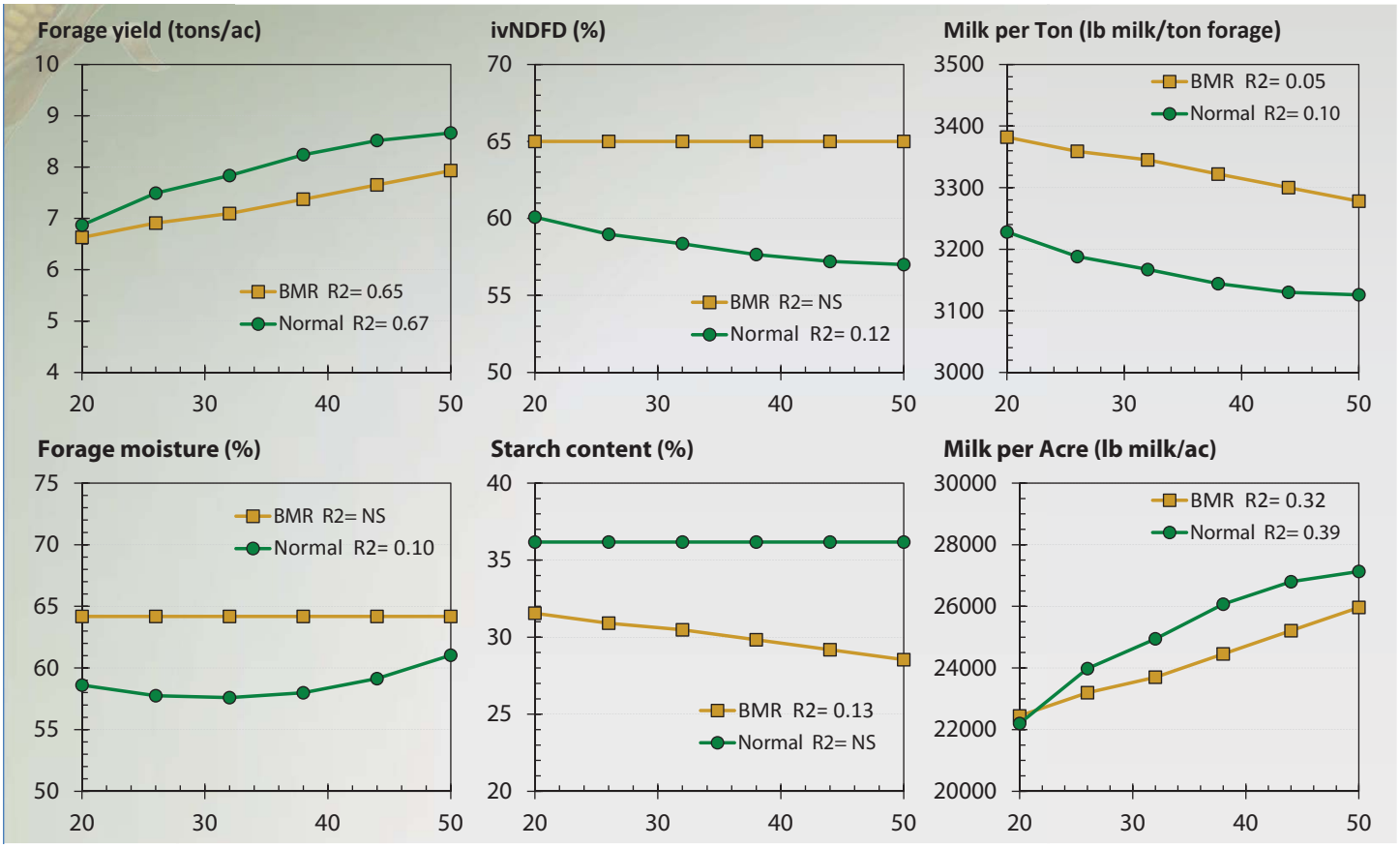
To illustrate, ask these questions, "How thick should corn silage be planted?" and "Should bmr corn silage be planted at different populations than normal hybrids?" Unfortunately, there is no simple answer to the first of these questions. Usually fields that are planted at too high of a population have greater lodging, poorly filled ear tips, and a greater number of barren plants. The ideal plant population depends on several factors:

- **Soil Type:** Heavier, finer textured soils have better water holding capacity and can support higher populations than lighter, coarser textured soils.
- **Planting Date:** As plant population increases, an early planting date becomes more important.
- **Hybrid:** Some hybrids tolerate high populations better than others. Maturity is important. Shorter, earlier hybrids are usually more responsive to high populations than taller, later hybrids.
- **Soil Fertility:** High populations remove more soil nutrients that must eventually be replaced.
- **Moisture:** Plenty of moisture is needed for higher populations to be advantageous.

The main problems encountered by plants in overplanted fields are problems associated with drought conditions and the hybrid's ability to withstand stress. However, the yields of well-fertilized corn do not fall off very sharply when population is above the optimum, even in dry years.

The effects of high plant population for corn silage production are less important because lodging is less of a concern. In the past, fields

Figure 1. Corn forage response to plant density for brown midrib (bmr) and normal corn hybrids grown during 2011 and 2012 at Arlington, WI (n= 482 plots). Values along the X-axis are Harvested Plant Density (number/ac) = number x 1000.



harvested for silage were typically planted at rates of at least 10% more than what was recommended for grain. Typically, grain yield decreased drastically at these extremely high plant populations.

The answer to the second question is more straightforward. Many workers have reported consistent forage yield increases with increasing plant population. Quality changes have been less consistent. In general, as plant populations increase, fiber levels increase and digestibility and starch content decrease. Some studies report no significant silage quality changes over a fairly wide range of populations.

In 2011 and 2012, bmr and normal corn silage reports were grown at various plant densities. Results indicate that whole plant yield increases with increasing plant population through the entire population range (Figure 1). Bmr forage yields were similar to normal corn hybrids at the lowest plant densities. Significant but small changes in quality were observed. Stover digestibility (ivNDFD) was always greater for bmr hybrids regardless of plant density. The trade-off was lower starch content for bmr hybrids as plant density increased.

How do these small changes in silage quality affect potential milk production? In this experiment milk per ton decreased as plant population increased with bmr corn hybrids yielding more milk per ton than normal hybrids. However, because of the lower bmr forage yield, milk per acre was lower except at very low plant densities. Milk per acre increased throughout the population density treatments suggesting maximum milk per acre was achieved at the highest plant populations.

Typical harvested plant population recommendations for corn grown for grain in Wisconsin range between 30,000-34,000 plants/ac. If fields have lighter soils, 28,000 plants/ac is about right. If a field will be harvested for corn silage (since there is less concern about lodging when producing corn silage) then increasing plant density 2,000-3,000 plants/ac over that used when producing grain is a reasonable decision, thereby increasing forage yield and milk per ton. The trade-off will be lower quality (milk per ton).

Hybrids react differently to increasing plant density, so check with the company of the hybrid planted. They know the population tolerances of their hybrids and make recommendations accordingly.