Growing Crops and Feeding Cows with Less Water... *utilizing sorghum silage*

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Sorghum and Dairy... Arid Companions

1. Sorghum hybrids are suited for arid climates
   - Western dairy migration
   - Sorghum more suited than corn if arid
   - Capable of roughage & starch production

2. Sorghum hybrids offer flexibility
   - Multiple cuttings possible
   - Flexible planting and harvest dates
One plant many feedstuffs!

- Silage
- Dry Milo Grain
- High Moisture Milo Grain
- Dry Hay
- Balage
- Dry Milo Stalks
- Stalklage
- Graze Fresh or Graze Stubble
- Milo Distillers Byproducts
Carbon and Nitrogen

For a dairy farm, carbon and nitrogen = $$$$$$

Milk Protein and Milk Fat lbs sold = dairy income

In arid climates, should more of the C and N come from SORGHUM species?
Carbons in Sorghum Crops

Fiber in sorghum stalks and leaves is abundant!
- This fiber is needed for rumen health
- End products of fiber digestion make butterfat

Starch level in sorghum grain almost equal to corn!
- Recent analysis indicate approx 70% starch
- Starch digestion drives milk protein production
- Discussion needed on processing hurdles

Sugars in sorghum stalks act similar to starch
Nitrogen a lesser player

Crude protein content important, but in 2nd place
- Depends on price of alfalfa
- Is SBM $500/t or $350/t

Why does protein vary in the plant?
- Level of nitrogen fertilization
- Stage of maturity at harvest
- Variety

Range in forage = 9-18% (remember nitrates!)
Is all fiber equal? BMR...

Fiber digestibility is key in the diet
- There is a limit to *undigested fiber* in the diet
  - Bulk fill limits intake and thus milk
- Stage of maturity at harvest... young is better
- BMR genetics increase digestibility for sure
  - Some interest but slow to catch on in dairy industry
  - Agronomic considerations (yield, water, lodging)
  - Definite value to the dairy producer
“This BMR sorghum will replace corn silage!”

Really?

**BMR genetics** improve **fiber digestibility** which is good but comparing BMR sorghum silage to corn silage is like comparing **pickups** to **tractors**...

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**Corn silage** is fed primarily for **starch** from the high grain content. Correctly fed **BMR sorghum silage** is fed primarily for the quality **fiber**.
But isn’t there lots of grain in my silage?

Yes, but we have a serious digestion problem!

*The problem is with the BB’s*

Variety trials with lab results from finely ground samples may not relate well to the true digested nutrients in an actual feeding situation.
DNMC Research- CSU

Determining starch availability in Sorghum Silage
- Use commercial dairies with high sorg sil diets
- Feed, forage, TMR, manure analyzed for starch
- Utilize literature accepted corn starch dig value
- Lignin as a marker allows for dig calculations
- Find out if the visual BBs in manure are significant
- Develop a model for various pricing situations
- Look for trends of better dig sorg sil starch
  - Ration roughage levels or plant maturity
Possible to process the BB’s?

The milo kernels are *too small* for normal kernel processing rolls in silage choppers.

There has been some discussion about a solution to this problem... will wait and see.

So, a 20% starch content from the lab may go in my computer at only 10%
In summary, forage is the focus

Until there is progress on a KP solution
- Focus on forage and fiber from sorg silage
- Interest in BMR for sure... help needed
- Perhaps male sterile or photoperiod
- Complete needed research on kernel dign
Questions?

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