



ADVANCED AG SYSTEMS'

Crop Soil News

<http://www.advancedagsys.com/>

September 2016

"It is the crops that feed the cows that make the milk which creates the money."

Advanced Ag Systems
Research, Education, Consulting

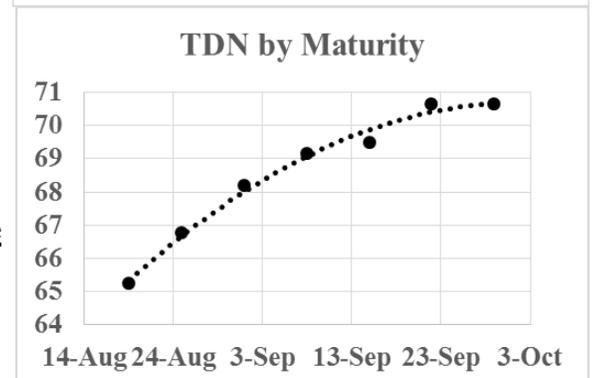
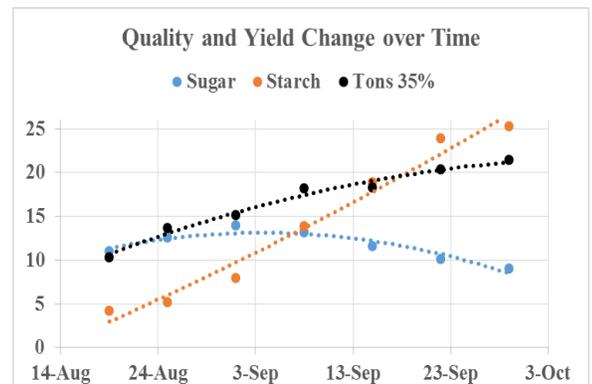
Harvesting Bmr Forage Sorghum

The season is quickly arriving at harvest time. This letter was supposed to go out September 1 but a seminar in Green Bay and preparing/planting 600 triticale plots in two different projects, kind of jammed my time – just like what happens on farms.

Our BMR brachytic forage sorghum has done well in spite of the extremely dry weather. It was planted the 25 of May but stood still for a while until it got watered (June 3 planting was killed by chilling injury from very cold temperatures). Soft dough stage was just reached today on most of the plants. Yields are running **22 to 25 tons of 35% dry matter** silage in spite of the very dry summer (we has some critical rains others did not). For those growing it for the first time the following are the questions you have asked or should be asking; the following are some suggestions based on our research the with the crop the past five years.

When to harvest: as the head comes out of the boot, sorghum is very different from other cool season grasses or winter forage. It continually adds both yield and quality. With the help of the New York Farm Viability Institute, we are determining exactly what the changes are in New York conditions and optimum time for milk production. Last year's data is presently being run through the Cornell Net Carbohydrate and Protein Synthesis model to determine the milk producing ability. Samples are being taken now to repeat the test this year.

Once the sorghum head is completely extended and pollination occurs; nearly all the growth effort is improving yield of quality and energy (see graph at right). As can be seen in the chart, as the crop goes from boot (Aug-14) to hard dough (Sept-29) the sugar levels initially increase until pollination and then slightly decrease as energy is moved to starch in the seed head. Even at close to maturity, there are still very high (for a forage crop) sugar levels in the plant. Conserving these plays a key role in rapid fermentation discussed later in this letter. TDN does increase slightly as it goes to maturity. Until we can complete the analysis we are suggesting that soft dough stage is optimum for maximum yield of milk/acre. **Soft Dough Stage is defined: the TOP seeds of the head, when squished, have the consistency of cooked oatmeal or mashed potatoes.** The nice thing



about this crop is that the seed heads start to change color when it reaches this stage. As you can see in the picture at right, the head goes from a green (on right) to a creamy tan color (two on left) as it goes to soft dough. Not all seed head mature simultaneously so you have to make a judgement call. **Do NOT make the MISTAKE** that some have where it reaches soft dough and then they start to sharpen the chopper, get the bunk cleaned out, buy inoculant, and a week later start to chop. The result as nutritionist have been reporting, is a lot of the energy in the sorghum seed goes out the back of the cow to feed the birds. Mature sorghum seed is hard like buckshot and about as digestible. Processors (discussed below) will NOT break much if any of the seed up. **YOU LOSE MILK PRODUCTION**. You are better to harvest a little early rather than a little late. Quality and yield seem to plateau at that stage. That said, from **boot to early soft dough the yield increased more than 40%**. From **flowering to early soft dough yield increased 20%**. The point is there is a right time and taking it to early leaves a lot of yield in the field. Another yield loss is the misguide idea that you improve quality by cutting higher. The stalk of BMR sorghum is very digestible; drop the head as close to the ground as you can run it. Get all the yield you paid for. Also because sorghum is so easy to cut, there is a tendency to go faster forward than the head can cut. You can't see it from the cab but the upshot is much longer stem left in the field and so significant yield is lost.



Lodging: with the sharp front and strong winds and downpours that came through on the weekend, some sorghums have started to lodge (including minor lodging in my brachytic dwarf at soft dough stage). For those growing the finer stemmed BMR sorghum-Sudan in a one cut system, or those with the standard bmr sorghum that has headed out, there may have been considerable lodging in spots. Don't panic. As you can see in the pictures at right, my standard bmr sorghum went flat in a hurricane. After about two weeks most of the crop had stood itself back up sufficiently that it could be harvested without going one way. BMR sorghum is amazing like that. Comparing BMR to traditional non bmr sorghum is like plastic tubing compared to copper pipe. One (BMR) bends the other (non BMR) permanently kinks. In worse case scenero, if it is down it can be mowed and chopped with a conventional haylage head. I do **NOT** suggest having the processor in the line as added soil picked up will put tremendous wear on the unit.



Above 1 day after hurricane; below 1 week after hurricane, crop is 2-3x taller.

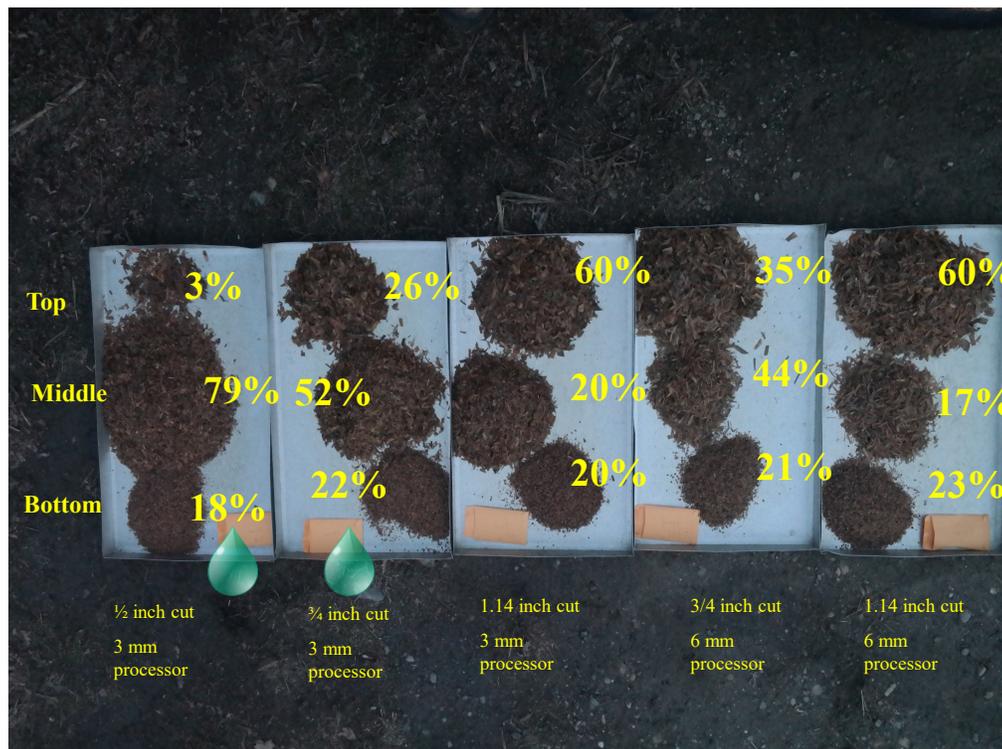
Chopping Length: Sorghum is a slightly wetter crop. Harvest moisture last year (2015) at late milk to soft dough, ranged from 28% to 31% dry matter across a number of sites. We harvested soft dough at the Valatie research farm site at 71.8% moisture and had perfect fermentation. **Chopper set up is critical**. We harvested at 1/2, 3/4, and 1.14 length of cut (longest the chopper would go). We started at 3 mm processing as that is what the chopper was set up for in corn. The silage was put in blue, oxygen limiting silo's (5 gallon pails from Lowe's – see picture at right) A jack and plate pressed the forage until it was the 11 to 15 pounds of dry matter/cubic foot that bunk silo's have. As can be seen in the photo at right and on the next page, we had excessive liquid from the two smaller cut length but not the 1.14 inch. Opening the processor to 6 mm (wires were backwards so it was as wide as it allowed it to go—I suggest wider) stopped the leachate from the 3/4 and 1.14 length of cut. We will be retesting again this year.



Short cut length and/or tight processing produces huge amounts of leachate—with loss of feed value.

Based on this we suggest **chopping at 3/4 to 1.25 inch** (longer cut does NOT mean using dull knives – keep them sharp, set correctly **with a square, properly adjusted shear bar**). BMR sorghum is highly digestible (like bmr corn) and can pass out the rumen before the majority of digestion is complete. Another benefit of a

longer length of cut is our research found significantly reduced amount of leachate from the silo even with very wet material. The longer length of cut also appears to preserve the sugars within the cells for use by the animal. The results of screening the various cut and processor lengths are in the photo at right. The first two on the left had excessive leachate. Remember, BMR forage falls apart quickly in the rumen and to get the extent of digestion, should not break down to small particles and wash out to soon. Processing will crack few if any seeds and so for that use is a general waste of power. For low populations of brachytic sorghum with very large stems, running the processor at 10 mm or more, will “debark” the larger stem and leave the pith as very effective but 100% digestible fiber in the rumen (see photo at right). Mostly we have found that opening the processor up in addition to longer length of cut, significantly reduce the amount of leachate coming out of the silo. (note: if bagging make sure the press fingers are square and not worn-otherwise it mashes rather than presses the sorghum and produces piles of leachate).



You are dealing with a higher moisture, much higher sugar forage than you are used to (unless you already are making money with winter triticale –another high sugar, highly digestible forage). We have had perfect fermentation with dry matter as low as 18%. The key is minimize leachate and **USE THE PROPER IN-NOCULANT.** We highly suggest a homolactic bacteria (without enzymes) to make sure you are preserving the forage properly. There are some now available that are designed for high sugar wet forages that also are said to inhibit Clostridia formation. With all the sugar and highly digestible fiber in sorghum, you don't want to trust fermentation to whatever is present in your field.

We don't claim to know all the answers. As we continue to research both growing and processing this crop we will keep you posted on any updates.

Sincerely,

Thomas Kilcer,
Certified Crop Advisor

172 Sunnyside Rd
Kinderhook, NY
12106

Tel: 518-421-2132

tfk1@cornell.edu

The Helping
Hand
to Better
Agriculture

