ADVANCED AG SYSTEMS'

Crop Soil News

http://www.advancedagsys.com/

JANUARY 2016

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

Advanced Ag Systems
Research, Education, Consulting

BMR Sorghum Planting in the North

My apology to those who missed the letter the past couple of months. I had a huge number of winter forage and sorghum samples to harvest/process/ship out. There is only one of me and only so many days in the month. I just ran out of month – sort of like farming.

There has been a growing interest in the use of sorghum as a corn replacement or partial replacement across much of the northeast and southern Canada. Many areas are constrained by short seasons already. A large number of farms have decided to get off the "long season corn" train. They were sold on the idea that the only way to high yield is by longer season. That drives harvest late into the fall when weather is poorer and fields are often wetter. The farmer takes all the increased risk. Based on a number of corn silage trials, the longer season corn does not always out yield the shorter corn. There are a number of companies with short season corn with floury endosperm (much shorter season corns often are derived from varieties with flint type kernels so even with processing; this hard corn passes through the cow without digesting). Even with the new varieties, there is a lack of BMR corn varieties shorter than 90 day. Thus the interest in the 85 – 89 day BMR sorghum.

Driving shorter season corn is the phenomenal growth of winter forage double cropping all the way into Canada. My replicated research over the past decade has found that the number one factor to high yields on winter forage (3 to 5 tons of dry matter/acre) is the date of planting in the fall. Earlier planting allows for more fall tillers to be produced which is what creates the high yields the next spring. Earlier planting crowds the corn season which pushes farmers toward shorter season corn. This is where the BMR sorghum comes in.

Although not very tall, this crop produced over 21 tons of silage/acre in 30 inch rows.

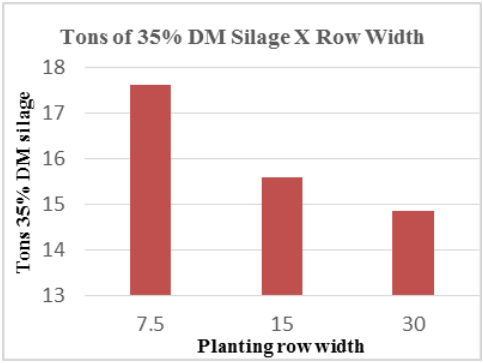
Sorghum for silage is not new. Bmr sorghum is nothing new. It has been around for years. I worked with it in the early 1990's and got very good yields – as long as I had enough people to help hand harvest it. When the grain head fills on the end of a pencil thin 11 – 12 ft stalk, it all fell down. There are newer brachytic dwarf varieties that have good standability. Caution: there are a number of "dwarf" varieties out there. They have fewer nodes and leaves (think grain sorghum), which means less silage yield. A **brachytic** dwarf has

Non Brachytic bmr sorghum yields well but lodges as soon as the head starts to fill.

the same number of nodes as a tall variety, but each node is slightly shorter. This produces a plant with all the leaves of tall one but less lodging problems. The stalks are very thick if planted at the correct population. Unfortunately, some farms did not check their planter and hence planted 100- 300% more than they should (see planter discussion below).

Tons 35% DM Silage/A	Yield Mean	Yield Max
2012	20.42	23.7
2013	24.78	26.99
2014	24.28	26.55
2015	16.57	20.15
2015 +rain	21.4	

The critical yield has been very competitive with corn. The table at the right is nitrogen trials from the past couple of seasons (corn is 18 - 22 tons of silage). Sorghum has always been thought of as a second class crop to corn. It is rapidly closing the gap. Yields the past several years are in the table at the right. The mean of all the nitrogen rates (including the 0 rate) is the second column. The third column is the highest yield with appropriate nitrogen, from the same trial. 2015 was probably the worst year for the crop. It started cloudy and wet (8 inches of rain in June) and then when we were supposed to be in July heat, temperatures went into the low 40's at night and the crop stood still. Adding insult to injury, we had a rain July 10, August 10, August 20 and September 10. Corn stopped growing and some died, and the sorghum even rolled. Every time it rained, the sorghum awoke and put on tremendous growth (sorghum produces twice the dry matter yield on an inch of water than corn does). Where they had decent rains, yields were 30% higher than what I got (2015 + rain in table).



We have grown the brachytic variety for the past couple of years. We are learning as we go, as cropping systems are very different in the rainy Northeast than in Texas where it was developed. Because the crop isn't planted until the **soil is above 60 F and climbing**, we are planting after most of the first cutting haylage is ensiled. This constrains the season even more (winter forage presses on the end of the season). In most of the areas, we just don't have the season to allow a crop to take its time closing between the rows and intercept all the sunlight. Thus farms that do not need to put it in rows, (direct cut corn heads), are able to both spread the seeds for greater light interception, and get stronger stalks to resist lodging, The critical advantage, as you can see in the graph at right, is the significant **18%** (over 30 inch row) **yield increase** by planting BMR sorghum in narrow rows (overall yield was reduced due to drought) . NOTE: narrow row planting is only for farms that can direct cut with a row-less head. If you have a row head corn chopper, plant in rows that match it. I would NOT suggest running 18 – 26 tons of forage sorghum through your hay mower!

As we learned with corn, exact seed placement is critical for uniform stands that maximize sunlight interception and produce thick stalks for maximum yield and standability. Corn planters with sorghum plates do an excellent job – for 30 inch rows. This misses a tremendous amount of sunlight before row closure. Corn planters (or soybean planters) on 15 inch row spacing will cover the ground a month sooner. A modern drill will do an excellent job if set up properly. It needs a gear reduction to allow the very low 8 – 10 lbs. seed/acre to be accurately dispersed. A huge factor we found in uniform planting was in the drop tubes. Most are corrugated inside. With the much smaller seed of the brachytic dwarf bmr sorghum, it easily hangs up in the grooves and then dumps in a concentrated cluster in the row (see photo at right). This plagued both my 1960's press wheel drill and the nearly new Great Plains drill I borrowed from a farmer. Replacing the corrugated tube with a **sleeved tube** made a day/night difference in the uniformity of the stands on both drills. If you are using a drill for either sorghum or triticale, it is highly suggested you

Typical seed dump from non-sleeved tubes found on most drills. This produces weak plants that tend to lodge and do not yield.

make the switch. They are not that expensive. (http://needhamag.com/innovative_product_sales/Smooth_Internal_Rubber_Seed_Tubes_For_Box_Drills.php I have no business connection with the company, only telling you about the product)

Utilizing drills without the sleeved drop tubes was an exercise in frustration, especially when we were trying to determine the optimum seeding rate for our northern, higher rainfall growing conditions. The seeds of the brachytic dwarf sorghum are much smaller than normal sorghum (18,000 seeds/pound compared to non-brachytic 13,000 seeds/pound). The smaller seed is slower to emerge, especially if planted greater than an inch deep. We were trying to shoot for ½ to ¾ of an inch deep but that is difficult with the drill. A cultipacker seeder (Brillion is one company) does a good job with alfalfa which needs to be ¼ - ½ inch deep. The guys from Texas absolutely cringed at the idea, but I put the sorghum in a cultipacker seeder and gave it a try.

The first issue was the potential to plant sorghum flour. Many of the older drills when narrowed to the low seeding rate we use, are too narrow to allow a whole seed to pass and so it gets broken or ground to flour before planting. Switching to the legume seed mechanism of the cultipacker seeder (relatively new, not worn out) allowed the smaller brachytic dwarf forage sorghum seed to meter through. I only found about 1- 2 % of the seeds were cracked. We planted into tilled soil that had been harrowed smooth. My estimate is that about 3 – 5% of the seeds were on the surface. We were planting 153,000 seeds/acre (8.5 pounds/acre) so that meant that 148,410 – 145,350 remained to produce the crop. When the stand emerged, it was uniformly dispersed across the area (see photos at right). We feel a slightly higher seed rate may be beneficial both to offset any losses from potential seed crack and that from un-germinated seeds on the surface. It also may allow for increased yield as increasing the number of mature stems that do not fall over increases the yield. We hopefully will be able to do a more replicated seeding rate study with the cultipacker seeder next season. A word of caution: we have only tried this on a fine sandy loam soil with only small stones. If you have a carpet of fist size or bigger stones that are not pushed down before planting, the drill will spend most of its time in the air rather than in the soil and the un-germinated seed on the surface may increase tremendously.

The above two pictures show the uniform stand we were able to get using a cultipacker seeder's legume box to plant the much smaller brachytic dwarf BMR sorghum seeds.

A huge concern of mine was that we would run into the perfect storm of poor germination where we get enough moisture to germinate the shallow planted seed from the cultipacker seeder; and then it will turn dry and they will die. It rained July 10, I put in the trial July 15 (it was just a planting/emergence test we do NOT recommend planting this late). It rained again August 10, with very low humidity in between. Sorghum is adapted from dry climate areas and the seeds germinated with no problem.

Future newsletters will cover the research we have completed on stage of harvest and length of cut with/without processing and milk producing ability based on stage of harvest.

Sincerely,

Thomas F Kilcer

Thomas Kilcer,
Certified Crop Advisor

172 Sunnyside Rd
Kinderhook, NY
12106

Tel: 518-421-2132

tfk1@cornell.edu

The Helping Hand to Better Agriculture