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Crop Soil News

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

Advanced Ag Systems
Research, Education, Consulting

Not Your Ordinary Harvest

Harvest is approaching. For many it will be very different from the past. A number of farms are growing sorghum or sorghum species for the first time. Its harvest timing is very different than corn silage if you want to get it right. In addition, there was a lot of corn silage planted in June and July. This corn could be very immature when it is harvested. Compounding that problem, multiple weather reports are saying that as this is a solar minimum year, cool to cold temperatures will return with a vengeance and the possibility of an early frost or freeze is above average. With the immature/late planted corn, this is not what we need. Immature corn silage is a lot like sorghum or sorghum-Sudan. It will be a wet, higher sugar, low starch forage. Chopping this with a short length of cut, and worse – processing, will produce forage the consistency of applesauce or soup. This is not beneficial to good fermentation, high milk components, or preserving nutrients (lost leachate is 100% digestible). The good news is that there are steps you can take to minimize these potential problems.

Our research in conjunction with Cornell University, supported by **New York Farm Viability Institute**, has found that there is no advantage to waiting for grain maturity with forage sorghum. In fact, there are major disadvantages. The first is lodging, which increases dramatically as the seed head matures (harvesting at Texas maturity stage - soft dough). The standard varieties were nearly all lodged. We found in our research that even the lodging resistant brachytic dwarf bmr sorghum fell down as soon after the tip of the seed head moved to soft dough stage. Second, if the seeds move to harder dough stage, they are the size of bird shot and as indigestible – going through the cow and out the back (too small for processing). Compounding the issue as the head matures or we move into September, is a significant decrease in fiber digestibility where most of the energy is stored. Thus, waiting for matured grain can decrease milk production. This means the sorghum species crop is ready for harvest before it is 30 – 35% dry matter. Many times, when the tip seeds reach soft dough, it will be just reaching 30% dry matter. Our research has found that **with proper steps we can make perfect sorghum silage at Dry Matters as low as 25% with NO butyric acid.** Many of these same key steps could be used with this year's immature corn.

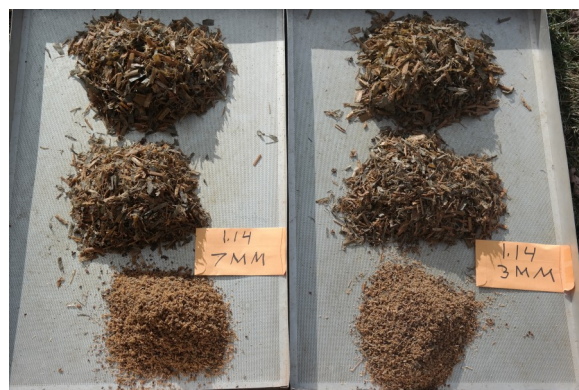
Directionless corn heads will chop sorghum very effectively especially if the plant is more than 4 feet tall. We have direct chopped sorghum, sorghum Sudan, Sudangrass, and Pearl millet. The harvest head needs to be down on the ground to get as much of the crop as possible as it is all highly



Directionless corn head successfully harvested headless photoperiod sorghum Sudan on right, headed pearl millet in center, and brachytic sorghum on left. With the head all the way down it all fed in to the chopper. Controlling your forward speed and a careful operator can make the harvest a success.

digestible forage. Watch your forward speed as it is so easy to chop that there is a tendency to drive faster and faster. You quickly pass the cutting speed of the head and then start leaving longer stubble in the field which is directly lost yield. The longer stubble is an immediate 10—15% yield loss of highly digestible forage from driving to fast. Plants that do not have a stem and/or head emerged and shorter than 5 feet will be all leaf and not feed in very well. These fields may need to be mowed to a windrow and chopped with a haylage head. We don't suggest trying to dry it wide swath as it is too thick and difficult to ted. The wide swath will also mix more dirt and contaminate when you try to rake/merge to a windrow.

The **first key step** is the length of cut the chopper is set at. Dr. Grant et al in Miner Institute's report ([effective fiber and feed quality](#)) found that as forage quality decreases, the shorter the length of cut the greater milk production from poorer forages. The reverse is true for highly digestible forages such as bmr sorghum species and immature corn. The smaller they are chopped, the faster they are flushed out of the rumen before you get the full extent of digestion. Larger particles will stay entrained in the rumen mat until the rumen bacteria extract the majority of the nutrient components. The other problem with chopping these silages fine and processing them, is that the higher plant moisture will turn the forage into the consistency of applesauce and produce hundreds of gallons of leachate which, besides making a smelly mess, removes the most digestible part of the plant. Each additional cut (shorter chop length) opens more plant cells for the liquid to run out. **Chopper set up is critical**. We harvested at $\frac{1}{2}$, $\frac{3}{4}$, and 1.14 inch length of cut (longest the chopper would go), with 3 mm processing. **We had excessive liquid (leachate) from the two smaller cut lengths but not the 1.14 inch**. Opening the processor to 6 mm (as wide as the chopper allowed it to go—I suggest wider) stopped the leachate from the $\frac{3}{4}$ and 1.14 length of cut. This is similar in wet corn. A cut length of a minimum of $\frac{3}{4}$ inch and preferably 1+ inch seemed to work best. Sorghum in Texas is reported to be chopped at 1.25 inch and the cows consume it all.



Utilizing the same length of cut but changing the amount of processing had little impact on the forage particle size on the top, middle, and bottom screen. It had a huge impact on leachate.

Processing vs Not processing. Our research has found **NOT TO PROCESS**. First, it is unnecessary as there are no hard kernels to break. There is NO increase in starch digestibility from processing the immature or nonexistent kernels. Thus, it is a waste of fuel and time. Second, the mashing and tearing vastly increases the volume of leachate and its lost nutrients. Supported by New York Farm Viability and with Dutch Hollow Farm (Claas), and Wil-Roc (Krone) farm's help, we tried multiple cutting lengths and processing gaps to figure out what was best for sorghum. We chopped at **1.14 inch length of cut** and took replicated samples processed at 3 mm (corn silage setting) and at 7 mm which was as wide as the Krone chopper's processor would go. We achieved a relatively uniform 10 – 11 pounds of dry matter/cubic foot from silage that was **21% dry matter** and nearly identical particle size (see photo on top at right). **The processing had a HUGE effect on increasing the amount of leachate coming out of our silo's. It increased more than 5 fold.** (lower picture of blue buckets). Analysis of the silos found that there was a significant sugar conserved for the 7 mm over the 3mm, reflecting less cell rupture and so preservation of nutrients within intact cells of wet forage.

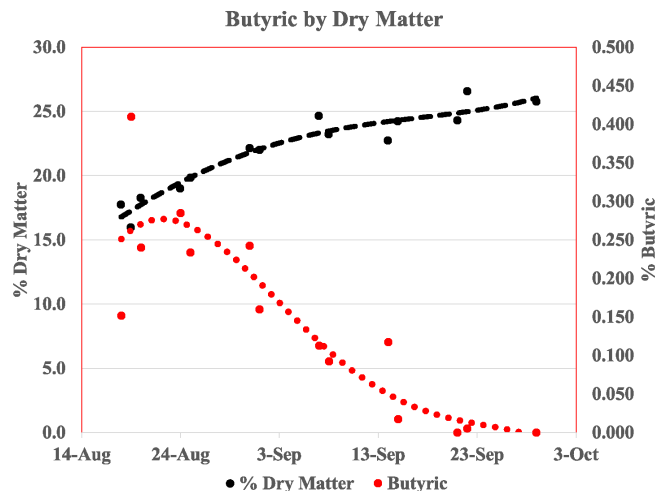


With the same 1.14 inch length of cut, 3 mm processor gap (2 on right) produced tremendous amount of leachate. The same forage with the same length of cut with the processor all the way open (7mm) had little to no leachate (2 on left).

For processing wet corn silage, Dr. Shafer found that when **CORN SILAGE IS 70% MOISTURE** or wetter, there is **NO BENEFIT TO PROCESSING**. Processing then is both a waste of fuel, wear on the processor, and simply increases the loss of nutrients running out of the silo. Pull the processor out or back before chopping any of the wet silage this fall. At the very least, open it as far as it can go. Setting it at start of har-

vest and **not changing will be a huge mistake this year.** This needs to be a **field by field decision.**

Sorghum species are a wet, very high sugar forage. Immature corn will be similar. The **USE OF A HIGH QUALITY HOMOLACTIC BACTERIA IS CRITICAL.** You wouldn't fertilize, lime, and till a field for a seeding; pick all the stones; then roll it and walk away to let whatever grows to be your hay field. The same is with this silage. Wine, beer, ethanol, cheese, and yogurt all use extracting inoculants to maximize the results. Having the right bacteria ferment your forage is critical to maximum preservation of nutrients to the mouth of the cow. In a replicated randomized test I ran on BMR sorghum, conducted with American Farm Products, the inoculated compared to the control was worth **2.3 lbs. of milk/cow/day more** in higher preserved NDFd. Another replicated study we did utilizing a Chs Hansen inoculant designed for wet, high sugar forage, we harvested at multiple replicated points from 17% dry matter to 30% dry matter. **No samples had any butyric over threshold (.500 on graph at right).** In fact, there was little to none detected when the forage was 25% dry matter or more.



If a light frost hits, don't panic. If the leaves just above and below the ear are ok, it will continue to mature the ear. Many times the frost will only touch the top few leaves. Allowing it to continue to mature brings the nutrient status closer to normal corn silage. The down side is that with considerable frosting of the plant the ruptured cells will leak their contents on to the leaf and be an excellent media for all types of bacteria, fungi, and yeast to grow and produce mycotoxins in your silage. The longer you delay for dry down the more of these organisms will be growing. It is very much a judgement call but early may be better than mold.



Immediately no-tilling winter triticale into the sorghum species stubble, will get it off to a good start for a high yield of very high quality forage the next spring.



The sorghum will die on the first frost and the winter forage will continue rapid growth into the winter. This is an excellent system for erosive fields.

Sincerely,

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Hand
to Better
Agriculture**

