



ADVANCED AG SYSTEMS'

Crop Soil News

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

September 2017

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

Three Critical Concerns This Fall Harvest

1, What You Drive In The Field:

The first concern is the wetter than normal soils across much of the northeast, and upper Midwest. That is BEFORE any hurricanes make it this way to dump on us. The naturally occurring Atlantic Multidecadal oscillation has switched to warm which will generate more powerful hurricanes until it goes cool again. Thus, the chances are greater one will wander over us to dump even more water. **WET SOILS HAVE A VERY HIGH POTENTIAL FOR PERMANENT YIELD-LIMITING COMPACTION.** Last week there was an outstanding **soil compaction meeting** in Ontario, Canada, by the Innovative Farmers Organization. <https://www.realagriculture.com/2017/09/innovative-farmers-take-action-on-compaction/> A complete report will be uploaded soon. Dr. Matthias Stettler from Bern University in Switzerland, a world authority on soil compaction, gave a background seminar and then ran field trials with a wide range of everyday farm equipment. Each was driven over sensors buried at 6, 12, and 20 inches. The results were stunning.

Governments limit road weight to 10 tons/axle to prevent the roads from being destroyed. When I was in Nigeria the roads were a mess because of single axle trucks overloaded. Yet we think nothing of running 18 to 20-ton choppers, or 38 ton loaded combines, with nearly all the weight on the front axle and tire pressure 35+; on living soil that deforms under pressure. **This is permanent damage to your yield.** With the wet soils this year it could be worse. Adding insult to injury, the trucks with road tires fully inflated are driving alongside the chopper. We saw serious compaction from a pickup truck with 250-gallon full fuel supply tank in the back (I will not comment on the size of the farmer driver!).



Tire footprint is critical for reducing surface compaction below threshold. Canadian farmers are switching to on the go tire pressure change. They drop below 15 psi when they pull in the field, and boost to 35 psi on the road.

Dr. Stettler found with compaction from tires that were over 15 psi at surface, you lose 15% yield the next year. It never reaches full yield again over the 10 years. Dr. Hakansson in Sweden found repeated compaction drove yield down 20% over 7 years. **"Soil compacts within seconds and takes decades to recover"** (Dr. Stettler). Our equipment today is turning the soil into bricks and then we buy very expensive deeper tillage tools to break up the bricks. Instead of soil we have fields of broken bricks. This is showing in real life as Canadian and US farmers are putting tile lines between tile lines trying to remove soil from fields that are evermore compacted by larger equipment running on the **wrong tires**

Advanced Ag Systems
Research, Education, Consulting

that are **inflated wrong**. Tire pressure controls top soil stress, the total load affects the more permanent subsoil stress. Total weight affects deep compaction (20 inch) which is a permanent 3% loss per each occurrence.

Bottom line: field tire pressure less than 15 psi, wheel load pressure less than 5 ton/axle. You can look at the damage from your own equipment at Dr. Stettler's site: <http://www.terrano.world/CH/light/Default.aspx?language=en>

A real surprise was that tracks were not the answer we expected as they added several tons to the total weight. The compaction pressure is NOT spread uniformly over the track but concentrated at the big wheels and each of the smaller roller wheels. What a number of farms in Canada are installing on their tractors, choppers, and combines is an on-the-go tire pressure. As they pull into the field the pressure is dropped to less than 15 psi to make a wide flat tire. On the road, it quickly brings it up to road pressure. Yes, this is a cost but not as much as permanent compaction yield loss and less than tracks. (Note: for packing bunks do the exact opposite of this; narrow tires with high pressure for compaction.



A shock to most of us watching the test, was the compaction from a loaded spray rig with narrow tires of high pressure. Wider tires helped (on right) but only if they were adjusted to less than 15 psi when in the field.

2, Corn Silage Harvest: Chopping Length, Processing Yes/No?

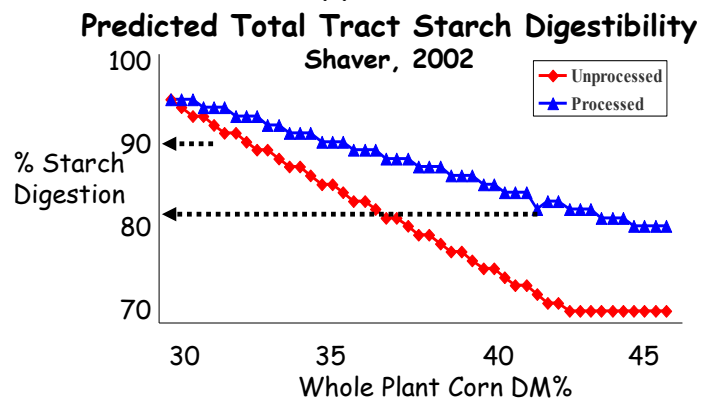
The variable weather this year was coupled the coolest end to summer in 26 years, with the first 10 days of September being the coldest in decades. This, plus late planted corn from wet soils, means acres of immature corn silage. The potential good news is that the second half of September will be normal to warmer than normal to help move the crops along. Fortunately, the past 5 years we have been working with wet energy forage – sorghum. This is similar to immature corn. In addition, many farms grew sorghum sp. this year when they could not plant corn. We have been testing different harvesting and processing systems and have some experience that we can pass on to you.

Chopping Length: With wet, higher sugar crops, it is **critical to change your chop length**. Harvest dry matter of sorghum (2015) at late milk to soft dough, ranged from 28% to 31% 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), 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 it allowed it to go—I suggest wider) stopped the leachate from the 3/4 and 1.14 length of cut. This similar in wet corn.

Processing vs Not processing. In another sorghum trial 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**. **The processing had a HUGE effect on the amount of leachate coming out of our silo's.** Processing increased the leachate more than 5 times. **Dr. Shafer found that when CORN SILAGE**

IS 70% MOISTURE or wetter, there is NO BENEFIT TO PROCESSING. (see graph above). Processing wet corn silage or sorghum forage is both a **waste of fuel, wear on the processor, and**

When is Processing Most/Least Effective?



*Based on data of Bal et al., 2000; Dhiman et al., 2000; Rojas-Bourrillon et al. 1987

simply **increases the amount of leachate coming 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 harvest and not changing will be a huge mistake this year. This needs to be a **field by field decision**. 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.

NOTE BAGGERS – Don't make corn squeezings: If you are running a finger press bagger, check the fingers to see that they are square edged, not rounded off (photo at right). Rounded ones mash like a fork through potatoes, rather than compress the silage. This increases the leachate tremendously. For both finger and rotary presses, we suggest backing off the pressure somewhat. Yes, it will take more bags, but can reduce the leachate by not over compacting. Wet forage packs well, excessive pressure is like squeezing grape juice from grapes – this is not what we want from silage. Remember, leachate is 100% digestible components that you are losing.



Worn press fingers on baggers act like a fork mashing potatoes on your plate. It just crushes plant cells and squeezed out the juice. Replacing or squaring them is critical for proper compaction without excessive leachate.

3, Don't Lose What You Paid to Grow and Harvest:

First, if you don't have an inoculant applicator, install one on your chopper and calibrate it. I prefer the liquid systems for better coverage, but either powder or liquid is better than none at all. There is a real potential with all the moisture and stress conditions this year to have molds and mycotoxins on the forages. Haylage reports coming in are not looking good. We are concerned that it will be worse for the high energy silages. Letting "natural" bacteria do your fermenting this year is like letting "natural" seed grow your new seeding instead of planting alfalfa. Plant the correct tested fermentation bacteria for preserving your forage. (note: check your water supply; chlorinated water will kill the inoculant. Aquarium stores have compounds to remove chlorine).

In 2016 I tested replicated samples treated with inoculant. Inoculant controls what is doing the fermentation. For those who think you don't need an inoculant, the **control had significantly higher lignin** than the two treatments, **indicating that considerable more dry matter was converted to CO2 and water and so lost**, leaving the indigestible lignin behind. The Net Energy of Lactation and the Kd/hr VanAmburg digestion rates (the good stuff in silage) were both significantly higher for the inoculants than for the control. The NDFd-30 was significantly higher compared to the control. Again, as the more easily digested components of NDF were lost in fermentation without an inoculant, the remaining NDF was less digestible. The loss of NDFd digestibility from no inoculant was equal to 2.3 pounds of milk/cow/day. For a 100-cow farm that is equal to **\$12,000 loss**. Even if it was half of that, you are still money ahead by using a homolactic inoculant and that was BEFORE we dealt with mycotoxins.

Dr Kung, a world authority on inoculant use said for this potentially wet fall corn silage, "*For a wet crop, a homolactic is better...do not use Lactobacillus Bucneri on a very wet corn silage crop - or the odds that you will get an inversion of lactic to acetic (more acetic than lactic) is high. Wet corn silage fermentations will make a lot of acid, and a lot of wild acetic. This may cause issues at feed out.*"

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**

