



ADVANCED AG SYSTEMS'

Crop Soil News

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

Male Sterile BMR Forage Sorghum: the good, the bad, the ugly

The last newsletter covered the research breakthrough of enhanced nutrition in BMR forage sorghum. Now for the rest of the story.

With the data from the 8th-week harvest, Dr. Larry Chase of Cornell University entered it into the Cornell Net Carbohydrate and Protein System model. This gives us a prediction of how it would work in a real ration. The ration was balanced for an 85 lb./day production level. For the 2022 season, we went **8 weeks after heading** (same as corn silage after tasseling) instead of the 6 of the 2020 season (right side of table below). The longer enhanced nutrition of the 8th week required only 0.6 of a pound of corn meal to equal a good corn silage in the diet. This was the same for the Pennsylvania trial and the Northern NY trial. The 2020 study which only went 6 weeks after heading required 0.9 lbs. of corn meal.

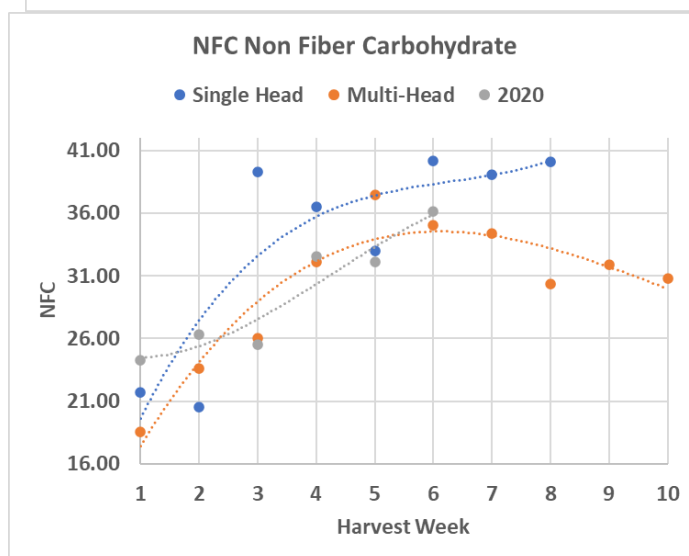
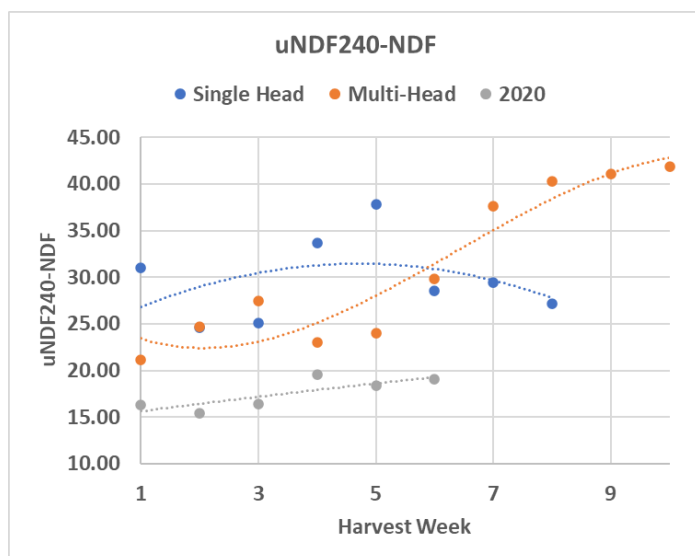
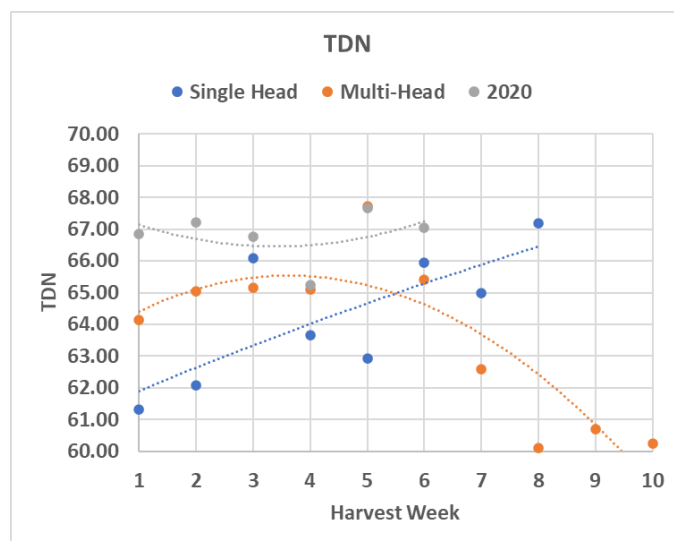
Item	Base Corn Silage 2022	Sorghum-PA 2022	Sorghum-NY 2022	Base Corn Silage 2020	Sorghum-NY 2020
Corn silage, lbs. DM	20	X	X	20	X
Sorghum silage, lbs. DM	X	20	20	X	18.8
Alfalfa silage, lbs. DM	13.5	13.5	13.5	15	15
Corn, lbs. DM	5.8	6.4 (+.6)	6.4 (+.6)	6	6.9 (+.9)
Soy Plus, lbs. DM	3.2	3.4	3.8	3.5	2.4 (-1.1)
Diet sugar, % (WSC)	3.8	12.5	13.7	X	X
Diet Sugar, % (ESC)	3.8	7.7	7.8	X	X
Predicted ME-Milk, lbs.	85.5	85.2	85.9	85.5	87.9
Predicted MP-Milk, lbs.	85.1	85	85.4	85.5	92.1

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A critical point in the economics is that the 2020 study had sufficient manure nitrogen to supply the latter part of the season. The resulting **forage crude protein (11%)** enabled the ration to be reduced 1.1 lbs. of protein/cow/day (\$5,000 savings/year on 100 cows). This more than offset the slight increase in corn meal cost. Both of the 2020 sites did not have sufficient nitrogen to support that protein level. Previous research found 11% crude protein is the normal for this forage if fertilized properly. We are planting a NYFVI research project in 2023-24 to determine the optimum nitrogen (plus sulfur) to raise the protein level in the forage. Our hypothesis is that the nitrogen for yield will level out before the nitrogen necessary for supporting crude protein. We have seen similar results in winter triticale nitrogen studies. We also hypothesize that manure may be a superior source due to the gradual release of organic matter throughout the summer. Any manure application needs to be incorporated within an hour of spreading to capture the ammonia nitrogen. This is why more farms are adding manure injection as a standard economic and environmental practice in their operation.

In selecting BMR male sterile forage sorghum varieties, you must work backward in the season. When will you harvest? Eight weeks before that is when the variety you select should head out. The number of days before that is when it should be in the ground. The latter number is determined by the genetics. Have your dealer clearly show you when it will head out, don't take a quick BS (bad science) made-up number. **It is important to get it right.** In northern areas, you are potentially squeezed between the time for heading and the soil temperature for planting. **Sorghum is NOT corn silage.** It is critical that the soil temperature be above 60F (preferably above 65) with the forecast for warmer temperatures the week after planting. Don't make the mistake I made of planting into soil that was 72F but 3 days later after planting got a 40F rain that killed the entire research project. Check the longer-term forecast.

The other season characteristic is for the southern half of the US of planting too short a season. In our trial the result was that we had a single male sterile sorghum head for the first 5 weeks with enhanced nutrition building. It then had warm and summer weather, so the plant sent out lateral shoots from each node. There were up to 9 male sterile heads emerged. As you can see in the graphs at right and below, the Total Digestible Nutrients (TDN) and Non Fiber Carbohydrate (NFC) components plummeted; and the undigestible uNDF240-NDF and lignin fractions increased tremendously. Here in Tennessee, you either have to select a full-season variety that heads out the second half of August or wait to plant a shorter variety that heads out the second half of August. This should keep the plant from activating lateral shoots.



Drilling in narrow rows or 15-inch rows is far superior to planting in 30-inch corn rows. My research found sorghum yielded 18% more when drilled than when planted in corn row width. The more uniform spacing increases stalk size and decreases lodging potential. Even without a heavy fertile seed head on male sterile sorghum, too high a population for the row space will increase lodging. If you insist on 30-inch row spacing, then we suggest a maximum of 4 pounds of seed/acre; 15-inch row 5-6 lbs. of seed/acre; and drilled a 6 to 7 lbs. of seed. Actually, we need to be talking in terms of the number of seeds/acre (just like we do with corn) as sorghums range from 12,500 to 17,000 seeds/pound. 65,000 is our population for 30-inch rows. Drilled into good soils with good fertility we want 100,000 to 110,000. Don't let anyone convince you to plant higher population or it will be lodged when you come to harvest. **We don't do that with corn, don't do it with forage sorghum.** Caution: check older drills when you plant these low populations as you may be planting sorghum flour instead of seeds. If at the low seed rate, the mechanism is smaller than the seed size, it will grind the seed and nothing will grow. If this happens, set the drill at double the desired population and then plug every other hole to increase the row spacing. This is not ideal but better than planting sorghum flour.



Planting male sterile BMR sorghum above 8 lbs. of seed/acre will lodge the crop before harvest. The center of the picture was too high a population and lodged. On the far right and left was correct population and it stood fine, even through two major thunderstorm events.

Unless you are organic, have the seed treated with a safener. This allows you to use atrazine and metolachlor (Dual type) herbicides to control weeds. Sorghum in warm wet conditions can emerge in 3 to 4 days so you need to apply herbicide as soon as you are finished planting. Any delay will allow weeds to get started.

Do not plant near or downwind of fertile sorghum, sorghum-Sudan, Sudangrass or Johnsongrass stands that are allowed to head. They will fertilize the male sterile sorghum and completely ruin the nutrient enhancement. The heads of male sterile sorghum are receptive to pollen for about two weeks.

Hopefully we will get a planting in the Catskill Mountains of NY this year. At 26% sugar on a dry matter basis, we want to find out if bears in this candy store will be a problem!

Sincerely,

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