
TOMORROWS FORAGES TODAY

QUICK INTRODUCTION

COFFEY FORAGE SEED

COFFEY FORAGE SEED

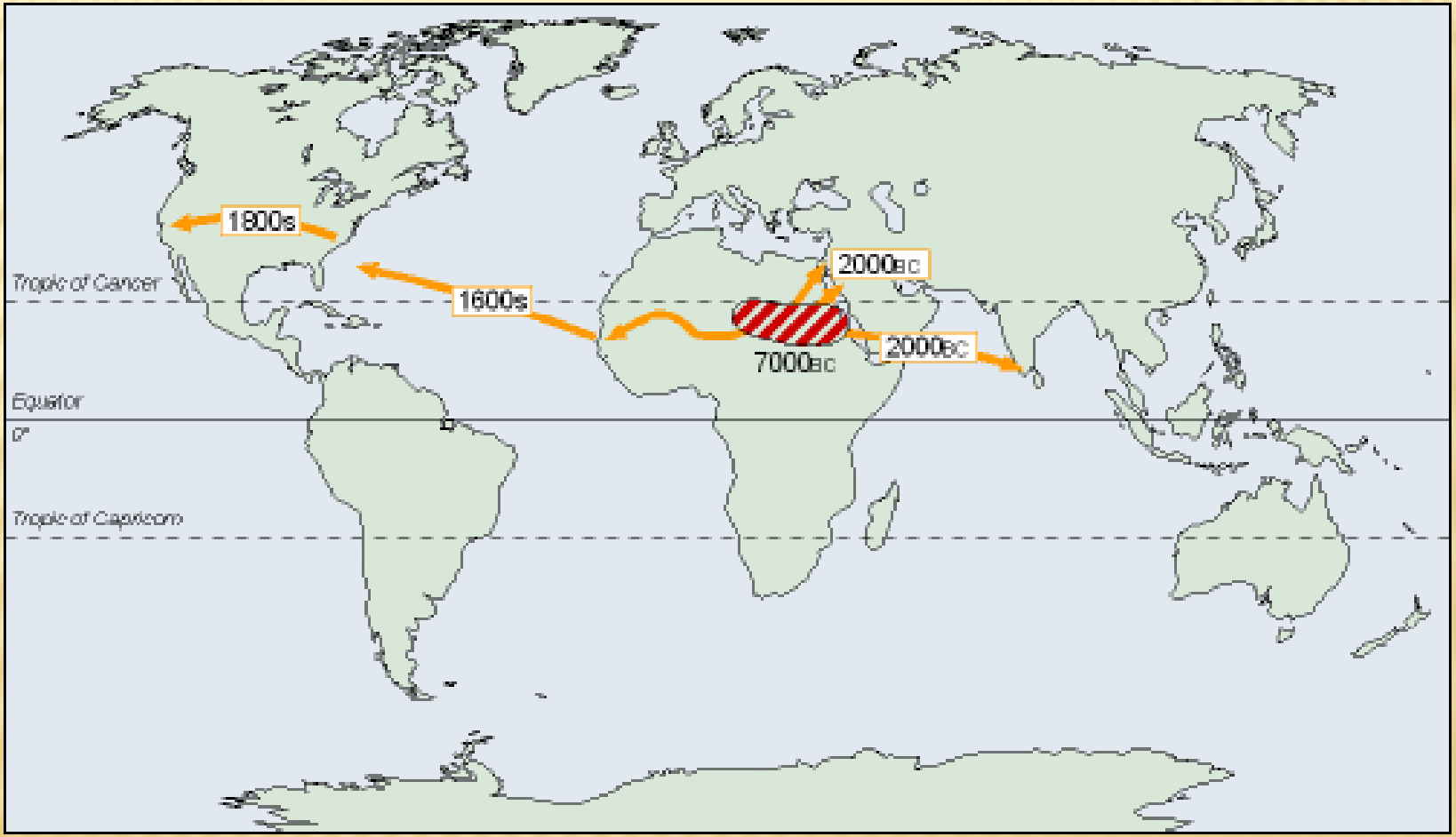
- Founded in 1978
- One of the largest breeding program in US
- Wholesale Worldwide
- One of the only working forage millet nursery in the world.
- Family owned to this day.

WHY WE'RE HERE -

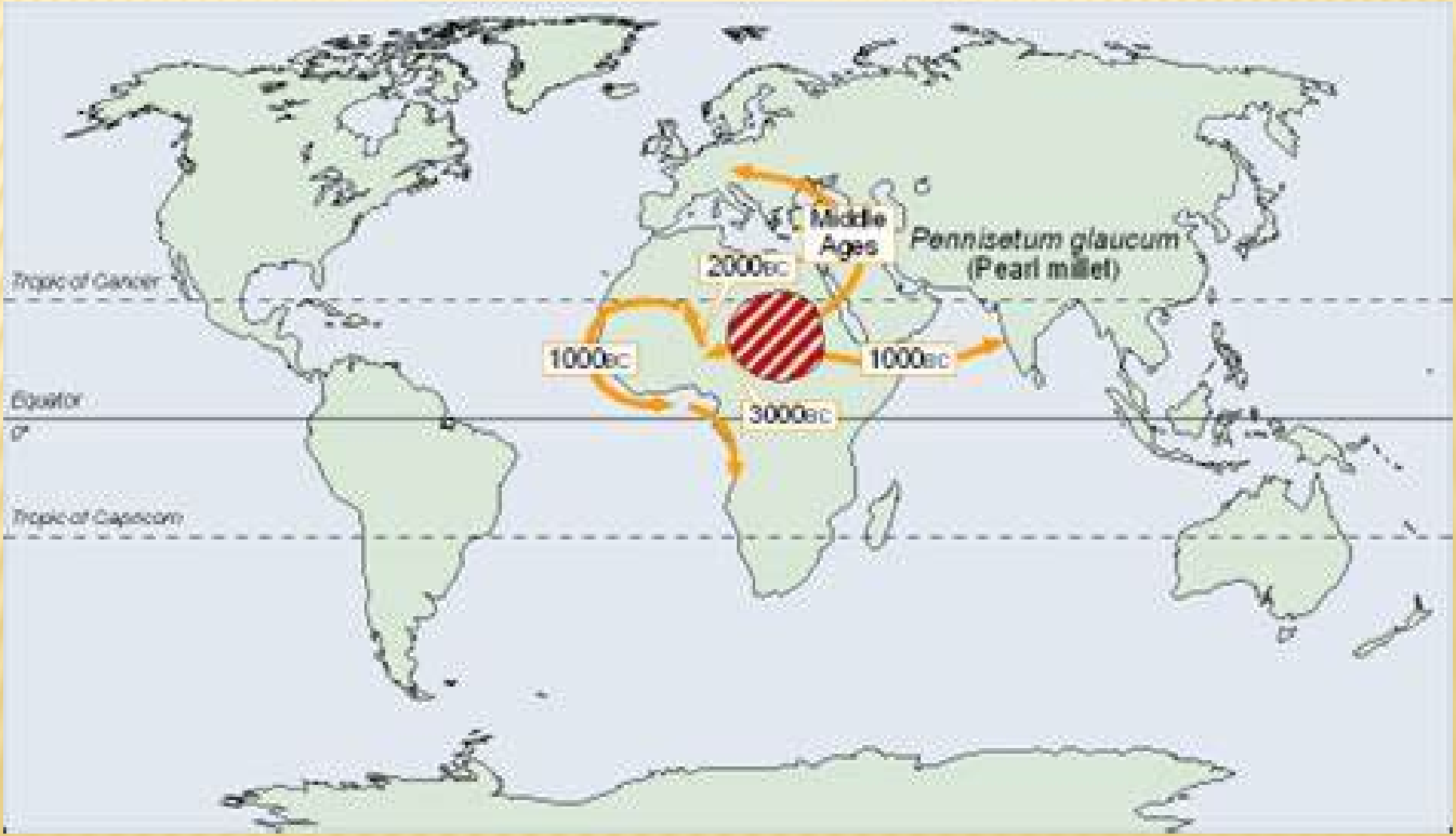
- Learn how to be better forage growers.
- Learn how to put more dollars in our pockets.
- Ultimately to create value for future generations to keep enjoying the industry.

TODAY'S BMR AGENDA

FROM THERE TO HERE FOR SORGHUMS



FROM THERE TO HERE FOR MILLETS



FAST TRACK TO TODAY

Early 1900s – Introduction as Forage

1960s: Hybridization & BMR Found

Late 1990s BMR Trait Commercially Used

WHERE BMR CAME FROM

- Natural genetic mutation found in sorghum.
- Not a genetically engineered trait.
- BMR stands for Brown Mid Rib

WHAT IS A BROWN MID RIB FORAGE

- 20-40% Lower lignin content
- Less Lignin equals:
  - More cellulose and hemicellulose are accessible to rumen microbes.
  - Higher fiber digestibility (more total tract NDF digestibility or TTNDFD).
  - Improved animal performance, especially in dairy cows and growing beef cattle.

FIBER SHORT COURSE - CELLULOSE

- Cellulose – Tough, but Digestible
- Long-chain glucose fiber in plant cell walls.
- Broken down slowly by rumen microbes via cellulase enzymes.
- Fermented into VFAs (energy source).
- Digestibility drops as plants mature or become lignified.

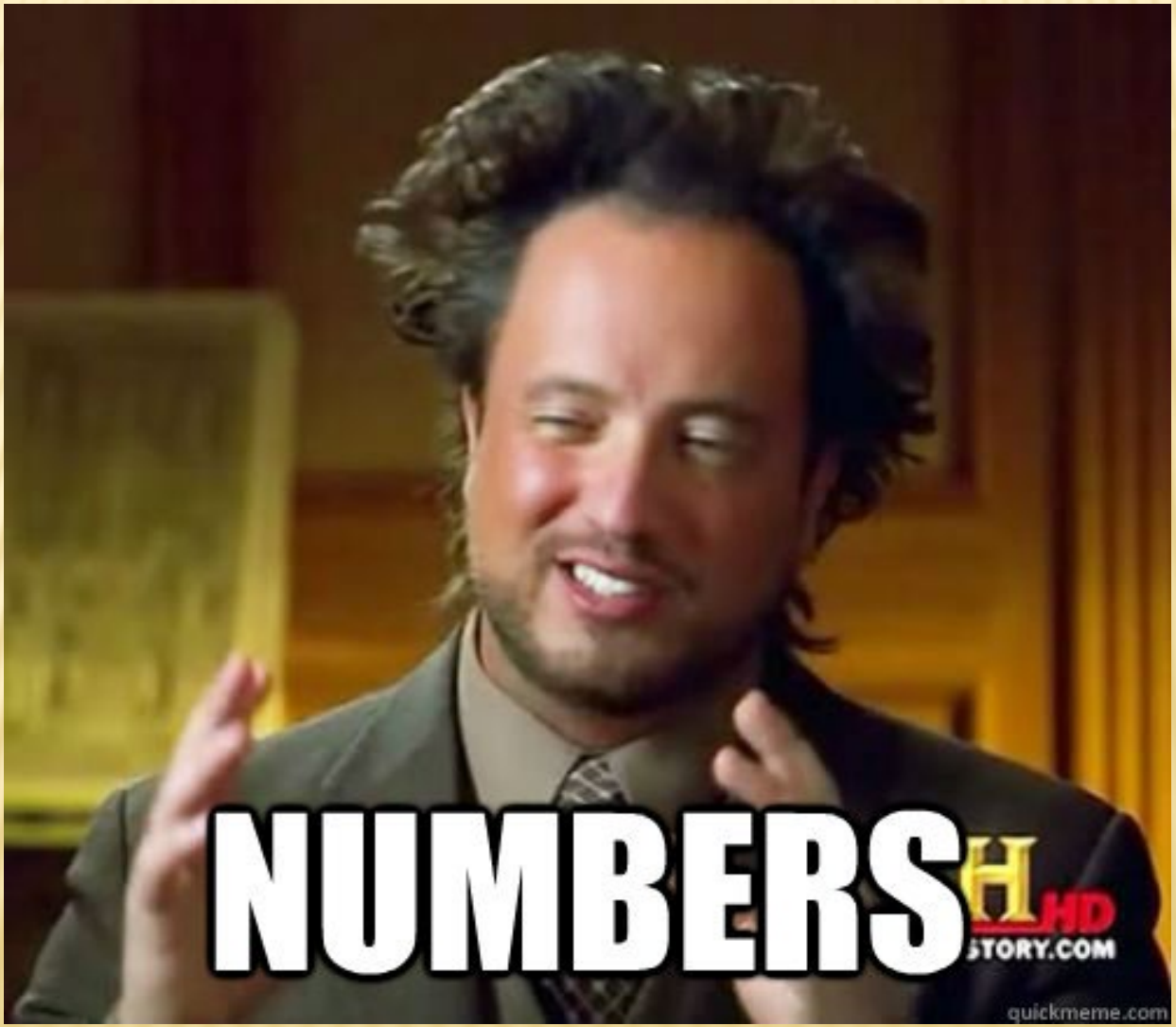
FIBER SHORT COURSE - HEMICELLULOSE

- Hemicellulose – Easier to Digest
- Loosely structured fiber made of mixed sugars.
- More rapidly fermented by rumen microbes than cellulose.
- Also produces VFAs for energy.
- Higher in young, leafy forages.

FIBER SHORT COURSE - LIGNIN

- Lignin – Less Digestible and Binding
- Non-carb compound that adds rigidity to plants.
- The least digested by ruminants or microbes.
- Binds to cellulose & hemicellulose, reducing digestibility.
- Increases with plant maturity.

DO YOU KNOW YOUR FORAGE TEST MATH?



- Anyone Using RFV or RFQ numbers to test their sorghum/millet samples?

THE FEED INDUSTRY HAS FAILED YOU!

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

RFQ LIMITATIONS

RFV or RFQ mostly used for legume-based forages

- Can make it challenging to compare how different forages will impact ration

Developed prior to uNDF/iNDF assays commonly reported & their impact understood

Doesn't consider rate of fiber digestion or potential passage rate

WHY DOES PASSAGE RATE MATTER?

- **Slower passage** = rumen fills up = reduced intake (higher lignin feeds)
- **Faster passage** = more frequent intake = potential for more energy (lower lignin feeds)
- **More dry matter intake** = higher ADG = more money **your wife** gets to pocket from you at the end of the year.

TEST QUALITIES FOR BMR FORAGES

- NDFD 30 – numbers above 50% (50-70%)
- CP% - above 9% in Sorghum (9-12%)
  - Above 13% in millets (13-24%)
- UNDFD 240 – below 10%
  - Numbers above 10 means more manure hauling!

******Numbers based on newer varieties at correct maturity******

Measuring Quality

Effects of Grazing Conventional and BMR 6 Sorghum-sudangrass on Performance of Stocker Calves.

	Gain (lbs/day)			Gain (lbs/acre)		
Forage Type	1999	2000	Mean	1999	2000	Mean
Conventional Sorghum-sudangrass	2.74	2.51	2.63	305	295	300
BMR 6 Sorghum-sudangrass	2.91	2.97	2.94	316	359	338

McCollum, et al. 2003. Texas Cooperative Extension

FERTILITY DISCUSSION POINTS

Each grower has a different “story” or management idea

Soil tests and past field history – KEY to future success and plan

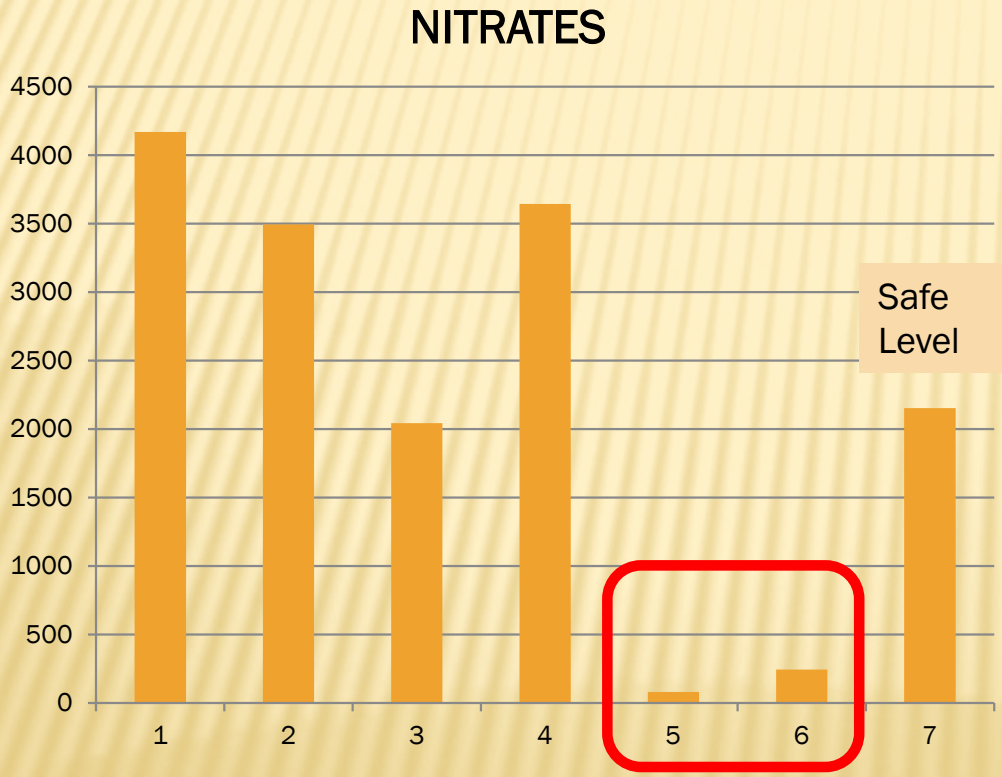
Full Season 1-cut crops (forage sorghum or pps sorg-sudan) are going to need more fertility added up front due to complexity of side-dressing P, K & S mid-season to get nutrient availability

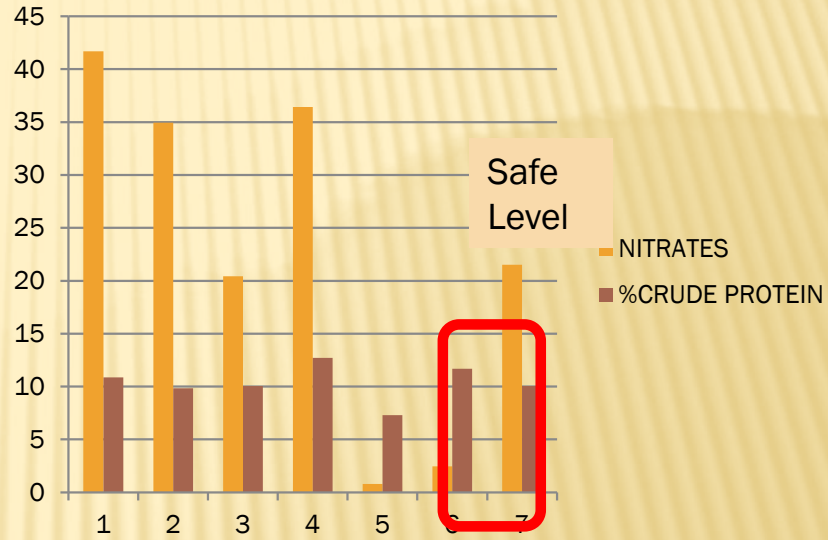
Multi-Harvest crops (sorg-sudan or sudangrass) - allows to side-dress or “feed” each cutting is HIGHLY suggested- luxury consumer of N and if a 50day cutting or graze has been fertilized too much up front….Nitrate Poisoning is a very high risk. It is ok to put the full season load of P, K & S (as long as not on sandy soil as S can leach)

Split application allows flexibility to watch rain patterns and systems to make in-season changes to the fertility plan.

Worst thing to do is “NOT FERTILIZE” (see study attached)

BALANCE FERTILITY





1. No fertilizer
2. 26 lbs... N
3. 52 lbs... N
4. 78 lbs... N
5. 25 – 10 – 0 - 5 – 1.5
6. 50 – 20 – 0 - 10 – 3
7. 75 – 30 – 0 - 15 - 4.5

FORAGE SORGHUM FERTILITY (SILAGE1-CUT SYSTEM)

RM Days to harvest	Nitrogen Units/Ac	P_2O_5 Units/ac	K_2O Units/ac	Sulfur Units/ac
Early (85)	90	63	80	18
Mid (105)	126	78	100	25
Late (125)	150	90	120	30
1 to 1.25# of N per day of growth- 5:1 ratio N:S				

Split apply N at multiple times is most beneficial for plant use and reduced N losses
**Based on irrigated production: dryland can be tailored for reduced management
*suggested to soil sample for base levels and adjust accordingly: manure considerations also

SORGHUM SUDAN & SUDANGRASS FERTILITY- MULTI-CUT SYSTEM @ ~40 DAYS OR 40”

Dry Hay or Grazing	Nitrogen Units/Ac	P_2O_5 Units/ac	K_2O Units/ac	Sulfur Units/ac
Each harvest 40~ day cut	45	35	40	9

DO NOT apply all Nitrogen for season up front in 1 application OR Nitrate issues will be **HIGH RISK** in first harvest

Split apply after each harvest event is complete, prior to new regrowth

*suggested to soil sample for base levels and adjust accordingly: manure considerations also

CHANGE IN GEARS

- From here on out we are specifically speaking of sorghum sudan crosses (haygrazers & millets)
- Please feel free to ask on forage sorghum questions as we go if you need to.

NOW WHAT?

Traits to add on top of the BMR trait:

- Male Sterile
- Photo Period Sensitivity
- Sugar Cane Aphid Tolerance
- Elevated WSC (New & Limited)
- Dry Stalk (Older)
- Dwarf
- Brachytic

LETS FOCUS FOR HERE

- Don’t get wrapped up in all of those options
- For the Southern Plains lets look at:
  - Sugar Cane Aphid Tolerance
  - Photo Period Sensitivity
  - Male Sterility

- *If you are using a forage sorghum to chop then the dwarfs are good options. Not enough time to present on the differences.*

SUGAR CANE APHID TOLERANCE

- Around since the 1970's
- A sorghum pest since 2013 –biotype change?

DESTRUCTIVE HABITS

- Decrease in tonnage (can be severe)
- Decrease in digestibility
- Increase in infected plant matter entering the rumen
- Increase in per acre production costs
  - Insecticides
  - Cant do much for control while grazing

SEE I TOLD YOU SO…

Agronomic Traits

Seed Color	White/Cream
Seeds/lb.	16K seed/lb.
Seedling Vigor	Excellent
Height (at heading)	5.5 Feet
BMR Type	BMR-6
Photoperiod Sensitivity	Non Sensitive

Proof of SCA Tolerance

Endurance

Non Tolerant Competitor

No insecticides were used to control aphids in the pictures above.

Pictures taken in 2019 with severe SCA pressure

SUGAR CANE APHID TOLERANCE

- No Yield Drag with trait
- An insurance policy against the aphid
- Can be layered onto other traits using breeding
- Saves many a pair of pants and shirts from being ruined.

PHOTO PERIOD SENSITIVITY

- Keeps sorghums in a vegetative growth state until the fall when the day length drops below 12 hours and 20 minutes.
  - Must plant AFTER 12hours 20 minutes of daylight is reached.
- Trait is naturally found within the sorghums especially in more tropical latitudes

WHY IT FITS IN THE GREAT PLAINS

- Pros-
  - The most drought hardy trait available
  - Maximum amount of DM tons per acre inch of water
  - Incredibly wide harvest window
  - Season long Grazing
  - Multi-Use Product
  - Variety: Evermore

EVERY STORY HAS TWO SIDES

- Photo-Period Cons-
  - Slower to grow than a non photo period hybrid
  - Slightly lower in WSC (sugars) than non photo period
  - Earlier hybrids of the PPS BMR type had standability problems

LOCAL FAVORITE

Planted in early June 2023. Nearly killed by drought while water was kept in cotton. Rain in August plus irrigation after cotton restored the plant health. Still chopped a little over 17 tons.

NOT ALL PPS ARE CREATED EQUAL

MALE STERILE HYBRIDS

- Does not make pollen which prevents seed set
- Keeps energy in the leaves by not setting seed
- More pounds on the hoof by keeping sugars in leaf
- This higher WSC can lead to improved drought tolerance
- Nice to not fight thick volunteer crops the next year.

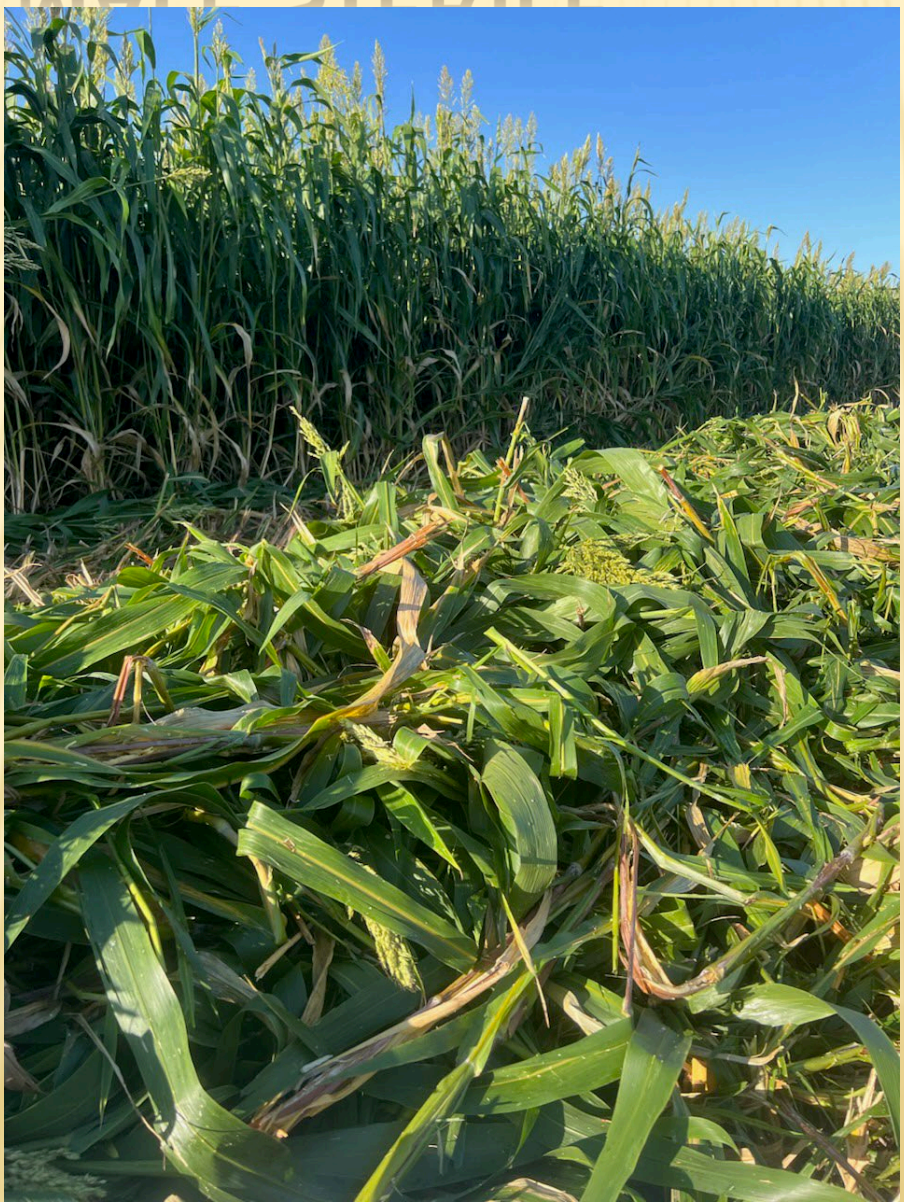
RELIANCE MALE STERILE

Fully Stacked Hybrid:
BMR-6
Aphid Tolerant
Male Sterile
Wide Leaf

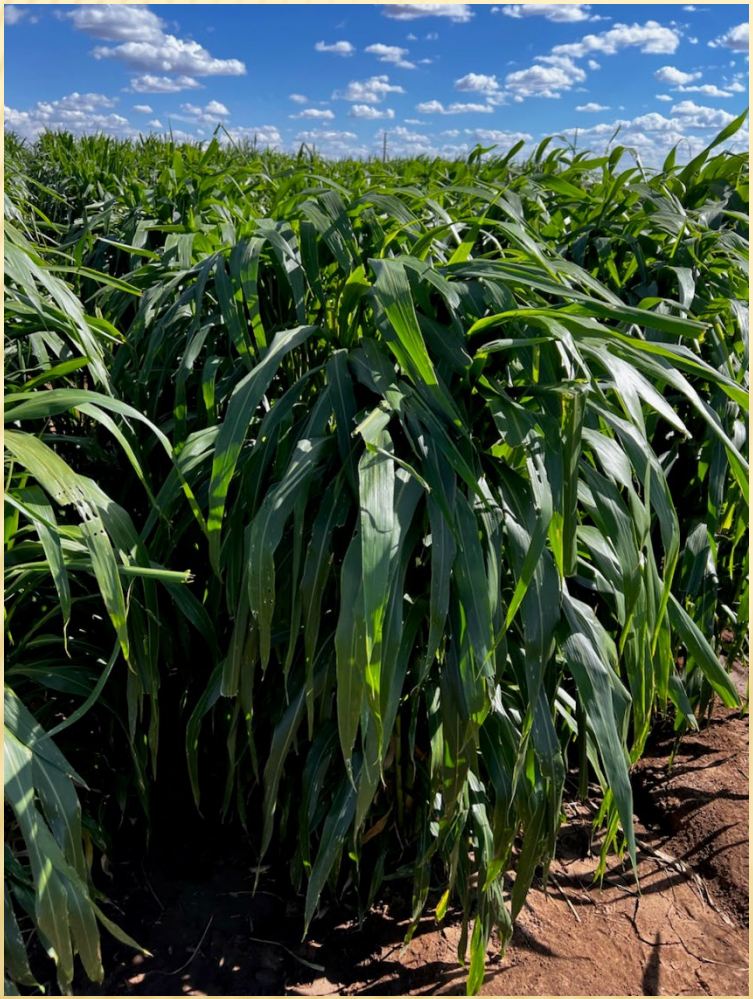
RELIANCE MALE STERILE

Remember!
Wide leaves = Hemi.
Equates to more ADG

RELIANCE MALE STERILE



BMR HYBRID PEARL MILLETS



- Incredible Protein
- Incredible Digestibility
- No Prussic Acid Issues
- Very Drought Tolerant

- Cons-
  - Less Tonnage
  - Nitrates sometimes

MILLET TESTS AT TURN OUT

Descriptio	Moisture	Dry	CP	ADF	aNDFom	Lignin	NDFD30	NDFD240	uNDFom2	ESC	WSC	RFV	RFQ	TDN	NEG	NEM	NEL	Beef/
4611 BMR	83.31	16.69	14.62	31.32	54.65	2.96	73.39	84.03	8.73	4.08	10.24	106.5	153.5	66.49	30.28	55.99	68.59	235.37
4611 BMR	83.01	16.99	17.2	30.53	51.15	2.91	74.15	84.61	7.87	4.49	9.88	115.1	163.5	66.73	32.38	58.3	68.86	236.68
4611 BMR	84.48	15.52	15.09	34.55	55.07	3.81	75.54	84.96	8.28	3.67	7.92	101.9	152.2	65.48	30.24	55.96	67.47	222.72
4507 Conv	85.51	14.49	12.47	35.29	56.39	3.74	74.36	85.74	8.04	3.3	8.48	99.02	142.1	65.26	29.17	54.79	67.22	199.41
4611 BMR	86.03	13.97	16.43	31.14	53.23	3.3	81.61	89.69	5.49	5	8.64	110.7	172.1	66.54	31.52	57.35	68.65	266.39

samples all hand sampled at roughly 45-50 days after planting.... Regrowth and second cut was taken 40-45 days later.

all swathed, wilted 2 days and chopped for haylage/silage.... Started feeding 2-1-21.... Will see soon how the jersies liked it!!

LETS GET DOWN TO THE NUMBERS

- Many producers don't like the increase cost per bag of newer traits.
- Everyone remembers when "haygrazer" was $15.00 per bag at the CO-OP
- Sure, it costs more. So does steak compared to bologna.

ILLUSTRATION OF INCREASED BEEF POUNDS/ACRE AND BEEF REVENUE/ACRE **(90 DAY CUTTING)**

Hybrid	cost per 50#	Planting rate #	Cost per acre seed	Total Tons #DM	RFQ	% Crude Protein	uNDFom30	Beef/Ton	beef/ac	$$ more BEEF per AC	$$ Value Per BAG BEEF#
Con. Cheap SxS	$40.00	20	$16.00	7.7	75.0	9.6	32.9	42	323	0	0
Br Dwf BMR SxS	$85.00	20	$34.00	7.2	95.0	10.4	17.3	97	701	**$439**	**$1,097**
Br Dwf BMR SxS AT	$90.00	20	$36.00	7.1	101.0	10.4	25.2	105	744	**$489**	**$1,222**
Assumption BEEF at $1.16											

Source: Dairyland Labs & Garland Dahlke, ISU extension

LETS MAKE A PLAN

- Plan #1 Grazing 6 weight calves in summer
  - Late May plant 70/30 blend PPS BMR SxS to BMR PM

    Planting Depth kept no deeper than 1” due to millet
  - Weed control behind drill imperative
  - Place cattle once forage reaches 36-40”
    - Placing calves earlier hurts PPS hybrids more than others
  - Manage Stocking density and graze as long as you wish. (remember that sorghums **will** get prussic acid at frost)

PLAN #2 – LATE PLANTED SXS/MILLETS

- Plant no later than first part of August
  - Do not use PPS varieties this late
- Use 80/20 BMR SxS to BMR Millets Blend

  Planting Depth kept no deeper than 1” due to millet
  - Weed control behind drill imperative
  - Place cattle once forage reaches 36”
  - Manage Stocking density and graze as long as you wish. (remember that sorghums **will** get prussic acid at frost)

THE "I HAVE NO IDEA PLAN"

- Most Popular Plan with Beef Cattle Owners
  - Not sure if you need hay, silage, or grazing this summer?
- Press the easy button- use a PPS, BMR, SxS
  - Option for Silage if you don't graze or bale
    - If you plant a forage sorghum you get stuck with silage
- Plant once soil temp reaches 65 degrees and has warm weather in the forecast
- Plant once 12 hours and 20 minutes of daylight has been reached.

LETS WRAP IT UP!

- Use BMR plus the new traits to add pounds on the hoof.
- Use feed tests wisely to determine value
- Remember the 5N/1S Ratio when fertilizing
- Use newer hybrids to make a grazing plan
- Don’t be afraid to mix millets and sorghums
- Feel free to contact me at Coffey with questions

THANK YOU!

THANKS!

Questions, Comments????

Contact:

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