

Using Warm-Season Annual Grasses to Restore Hay and Grazing Inventory



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Outline

- Initial considerations
- Forage options
 - Minor crops
 - Major crops
- Discussion



“The damage resulting on the ranges of Texas from the 5-year drought period, 1949-54, can be correlated with land management and the type of soil. In general, ranges that were properly managed before and during the drought came through in fair to good condition; overstocked ranges were severely damaged and subsequent recovery has been very limited. Thus ranchmen have evidence of the need for carrying out proper management practices year after year, not only to meet drought periods, but to build for an economic unit by capitalizing on the years of favorable moisture. Thus the old rule still prevails that close grazing does not pay.”

Young, V.A., 1956. The effect of the 1949-1954 drought on the ranges of Texas. J. Range Mgt. Vol. 9, pp. 139-142.

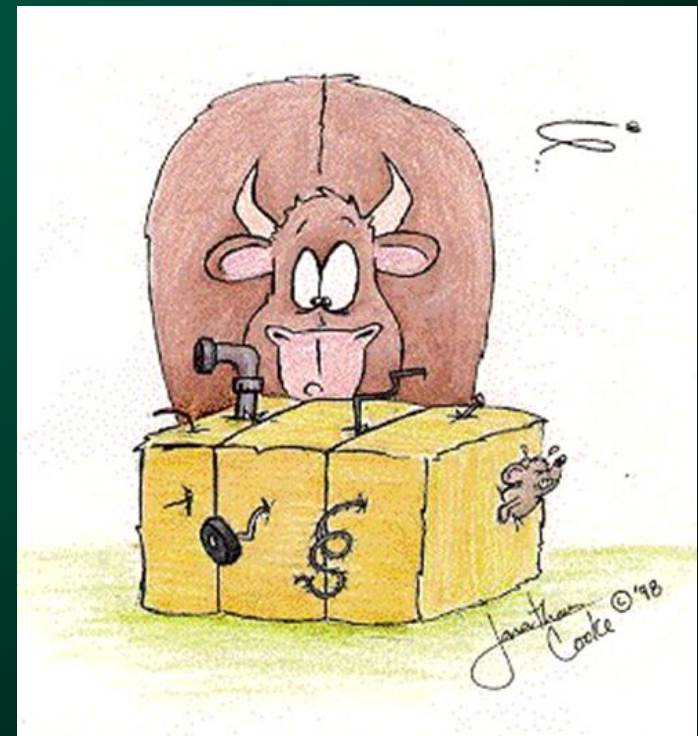
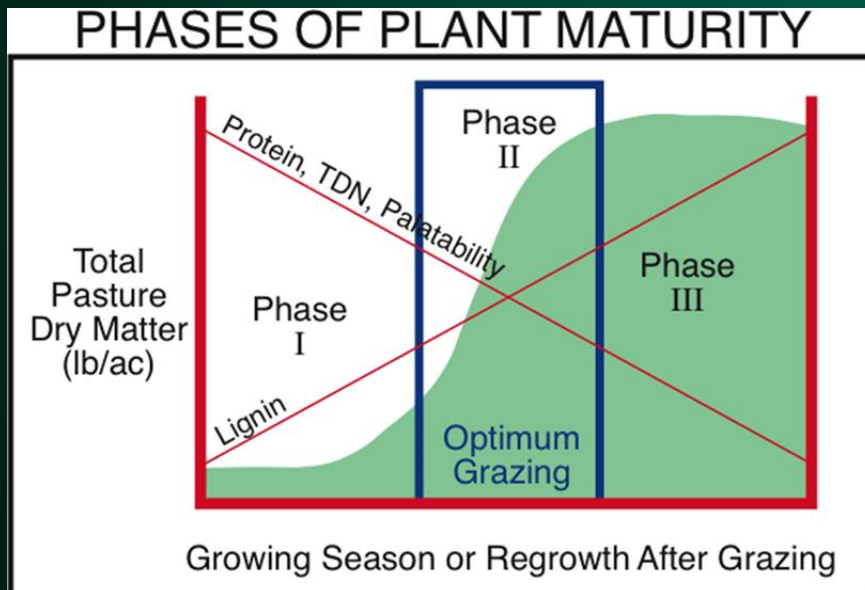
Consider - what can volunteer?



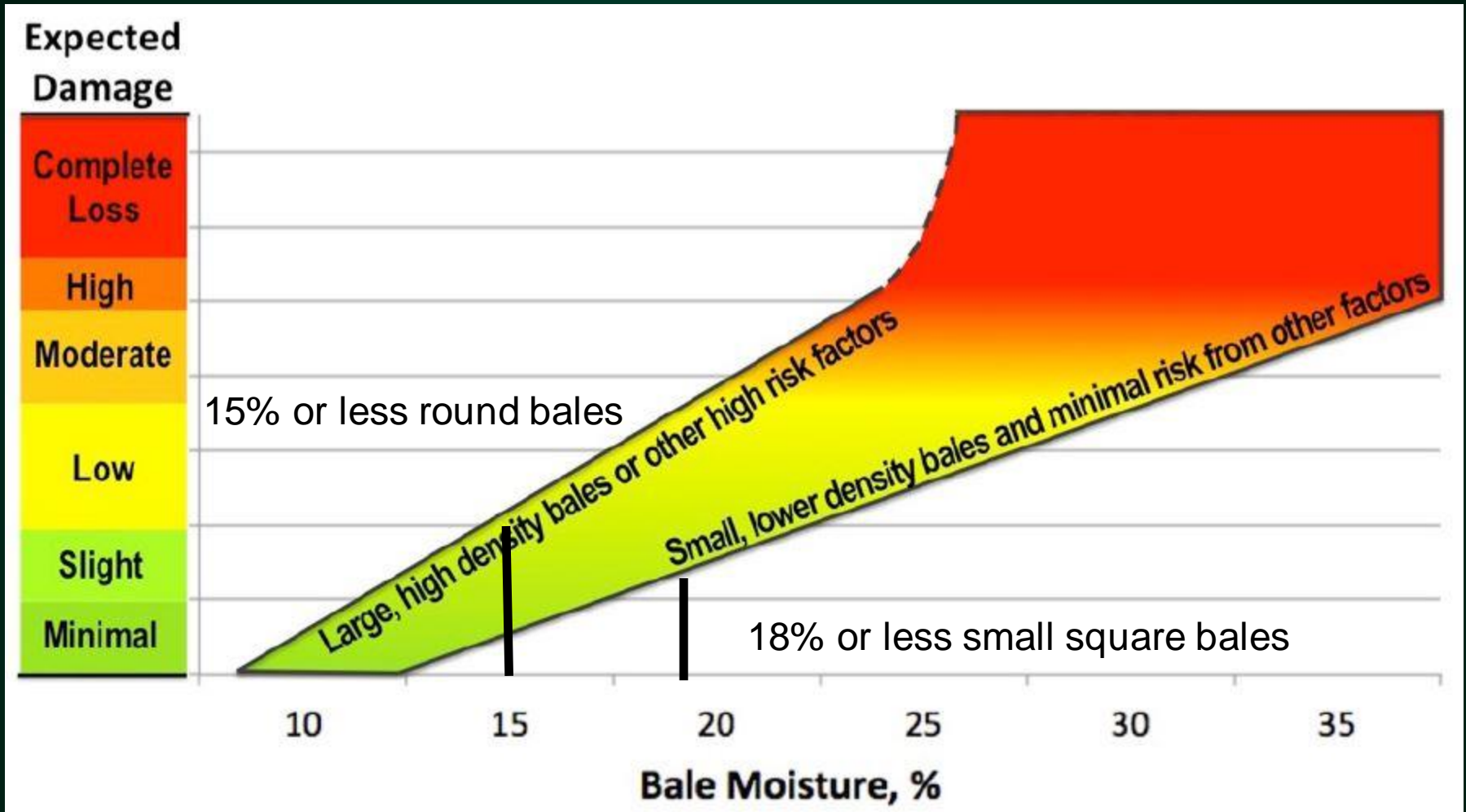
Consider - plant maturity effect on quality and intake

Species	Stage of maturity	%CP	%NDF	%ADF	%TDN	Estimated lbs DM intake 1300 lb cow
Sorghum-sudangrass	Vegetative	15	55	29	66	28*
Sorghum-sudangrass	Headed	8	65	40	57	24
Brome	Late vegetative	14	63	35	61	25
Brome	Late bloom	8	81	49	50	19

Estimated DM intake = (Weight x 1.2% NDF intake)/%NDF

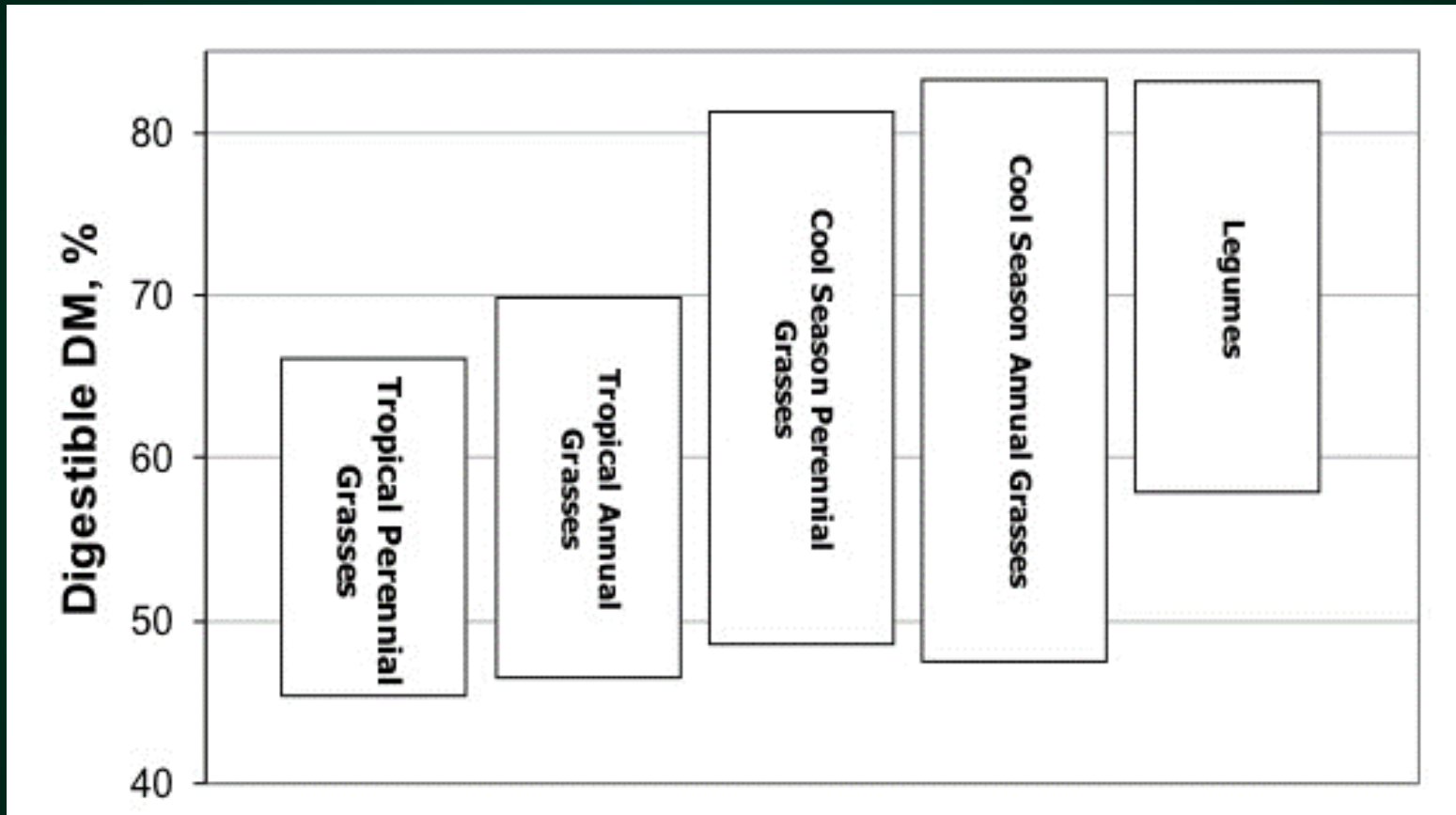


Consider moisture at harvest



Source: Dennis Hancock, University of Georgia Extension

Forage Species Effect on Quality



GA Extension Bulletin 1425

Consider cost of producing low quality forage

High Forage quality supplement cost	CP (lb.)	TDN (lb.)
1300, 90 days post calving, 25 lb. peak milk, 28 lb. DMI	3.4	19.7
Sorghum-sudangrass veg.	4.2	18.48
Difference	0	-1.22
DDG* supplementation lb.		1.79 lb. (\$0.36)

DM intake = (1300 X .012 intake as NDF)/.55 %NDF = 28 lbs DM intake/hd/day

Low low quality supplement cost	CP (lb.)	TDN (lb.)
1300, 90 days post calving, 25 lb. peak milk, 24 lb. DMI	3.4	19.7
Sorghum-sudangrass headed	1.92	14
Difference	-1.48	-5.7
DDG supplementation lb.**	6	8.38 lb. (\$1.67)

DM intake = (1300 X .012 intake as NDF)/.65 %NDF = 24 lbs DM intake/hd/day

*DDG \$400/T

**DDG Example for cost differences only, some mineral imbalances may be an issue

What are the options?

Rotational Grazing

Short Duration-High Intensity Grazing

Hormay System (rest rotation)

Leader-follower

Management Intensive Grazing

Continuous



Mob Grazing

Rotation

Multi-species



Creep Grazing

Strip Grazing

Time

Rest

Recovery

Deferred Rotational Grazing

Savory System

Flex Grazing

Rest Rotational Grazing

Adaptive Grazing Management

Spring small grain crops



Spring forage oats
Goliath, Hayden, Haymaker



Spring forage barley
Haymaker



Spring forage triticale
Merlin Max

- Seeding rate – 80-100 lb/ac, can be no-tilled
- Soil test for residual N and adjust N application rates
- Nitrogen – 25-60 lbs
- Yield 1-3 T/ac
- Good forage quality, harvest boot to early dough
- Nitrate accumulator

Warm season annual grasses



German millet



Browntop millet



White Proso millet

- 55-70 day crop, no prussic acid, can be nitrate accumulator
- Grazing or hay, little regrowth if hayed
- Harvest late boot to early bloom
- 15-25 lb/ac seeding rate, small seed, ½-1" depth
- No-till works well.
- 25 lbs N/T, make sure other fertility levels are adequate
- Soil pH 5.5-7.0
- Tolerates some salinity

Warm season annual grasses



Pearl Millet

- BMR and dwarf traits available
- 15-30 lb/ac seeding rate, small seed, ½-1" depth
- No-till works well.
- Harvest 36", 6-10" stubble height for regrowth
- Does not perform well on heavy black soils, wet soils; tolerates soil acidity better than sorghums, fits sandy soils
- Cautions with 2,4-D use

Warm season annual grasses



- Forage sorghums
 - Forage sorghum – High yield potential, good tonnage for silage, hard to deal with as a hay.
 - One big harvest
- Sorghum-sudangrass hybrids – silage, hay, grazing
 - Leave a couple of nodes if targeting multiple harvest
 - Slightly less yield potential than forage sorghum, can be a challenge to cure for hay
- Sudangrass – Finer stems, excellent grazing potential, good regrowth
 - Lower prussic acid potential
 - Gives up some yield but easier to cure
- Nitrate potential
- Prussic acid potential, low or no prussic acid lines are on the way
- Sugar cane aphid – tolerate varieties

Forage sorghum, sorghum x sudangrass, sudangrass pearl millet

- Traits, traits, traits

	Brown mid rib (BMR)	Photoperiod sensitive (PS)	Male Sterile (MS)	Brachytic Dwarf (BD)	Dry Stalk (DS)
Forage sorghum	✓	✓	✓	✓	✓
Sudangrass	✓			✓	
Sorghum-sudangrass	✓	✓	✓	✓	✓
Pearl millet	✓			✓	

BMR-6, BMR-12, BMR-18 – nineteen BMR mutants originally produced and numbered 1-19.

BMR-12 – appears to be higher yielding with higher NDFd.

WHAT DO I PICK?!

Warm annual grass season agronomics

Entry	Type	BMR	Dwarf (Brachytic)	Source
Turbo Brand BMR Brachytic Hybrid	Sudangrass	Yes	Yes	Millborn Seeds
Piper	Sudangrass	No	No	Millborn Seeds
Ranch Hand BMR	Sorghum x Sudangrass	Yes	No	Wilbur Ellis
31F65	Sorghum x Sudangrass	Yes	Yes	Wilbur Ellis
HayGrazer	Sorghum x Sudangrass	No	No	Wilbur Ellis
BunkerBuster	Forage Sorghum	Yes	No	Millborn Seeds
Redtop Plus BMR MS T	Forage Sorghum	Yes	No	Wilbur Ellis

Planted June 24, 2022

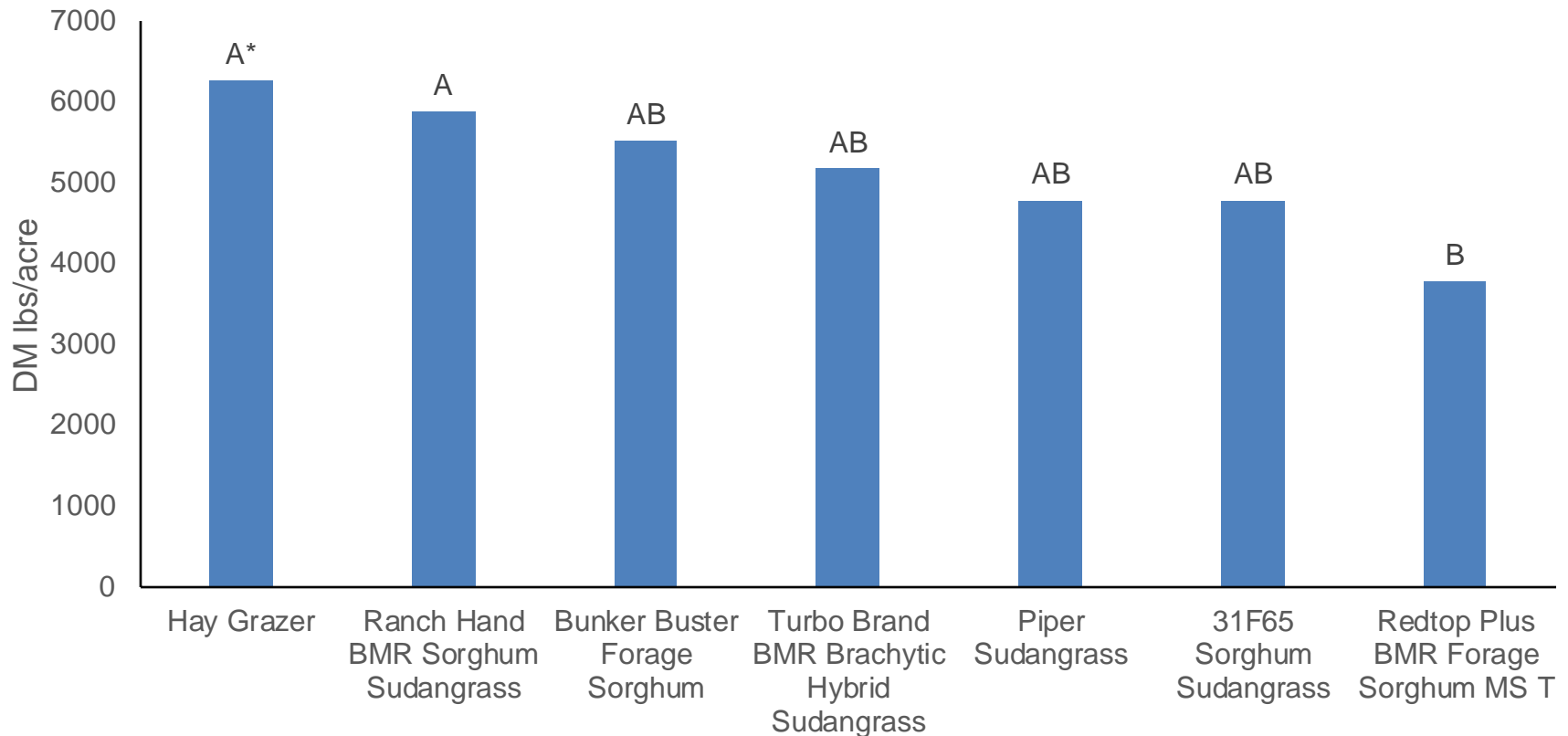
Seeding rate = 15 lbs/ac

50 lb/ac – 11-52-0 at planting, no additional fertilizer applied

All plots were mowed July 11.

Warm Season Annual Grass Yields

Harvest 10/22/22



*Haygrazer produced 5006 lb/ac DM total at 0 N in a separate trial.

Warm Season Annual Grass Nutritive Values

Entry	Type	% Crude Protein	% Total Digestible Nutrient	%NDFd
Turbo Brand BMR Brachytic Hybrid 1	Sudangrass	12.2 ^a	64.1	54.0
Ranch Hand BMR 3	Sorghum x Sudangrass	10.2 ^b	64.0	59.3
Bunker Buster 7	Forage Sorghum	9.6 ^{b^c}	66.6	69.0
Hay Grazer 2	Sorghum x Sudangrass	9.6 ^{b^c}	62.1	54.0
31F65 5	Sorghum x Sudangrass	9.0 ^{b^c}	64.0	59.0
Redtop Plus BMR MS T 4	Forage Sorghum	8.9 ^{b^c}	63.0	59.0
Piper 6	Sudangrass	8.3 ^c	59.8	49.3

Harvest 10/22/22

Establishment considerations

- Seed as a mixture? Yep, sure can. Keep in mind that mixtures complicate the hay drying process, for hay keep the mix simple.
- Anti-quality considerations
 - Nitrate concerns – small grains, brassicas, warm-season annuals
 - Prussic acid potential – grain sorghum > forage sorghum > sorghum-sudangrass hybrids > sudangrass
 - Dissipates with forage drying, decreases with silage
- How is the area prepared?
 - What herbicides have been applied?
 - Grazing and hay restrictions
 - Plant back restrictions
- Seed availability and cost

Nitrate management

- Soil test and account for residual soil nitrate. Previous crop and crop management and weather conditions will impact residual nitrate amounts.
- Split applications of nitrogen.
- Test prior to harvest if nitrates are suspected.
 - Account for field variation, include stressed areas or test separately.
- If a period of stress occurs close to harvest, delay harvest till plants are no longer stressed (7 days).
 - Forage quality may decline but it may be better than dealing with high nitrate levels.
- Raise cutting height – Nitrate concentrations are highest in lower leaves and stem. Raise cutting height improves quality, reduces ash content, lowers nitrates. Will reduce yield but, improves regrowth potential.
- Ensile – ensiling can reduce nitrate levels up to 65%.
- Haying will not reduce nitrate levels.
- Have a good livestock mineral program in place.

Cautions

- *Cystitis Syndrome* in horses grazing sorghum-sudan, (rare occurrence), potential is reduced with hay. No reports with sudangrass, not a problem with ruminants.
- Foxtail Millet hay should not be fed as the sole source of forage to horses. Acts as a laxative, contains a glucoside (setarian) that can damage kidneys, liver, and bones

Final thoughts

- A wise man once told me regarding drought and forage supplies: “nothing is going to happen unless I put seed in the ground.”
- Time –
 - Prep time
 - Planting, get the sorghums in early, this will give you more management options.
 - Now is the time – “crabgrass should be established when the leaves on the oak tree are as big as a squirrel’s ear”
- Impacts on subsequent crop.
- Questions?

Thank you!

