

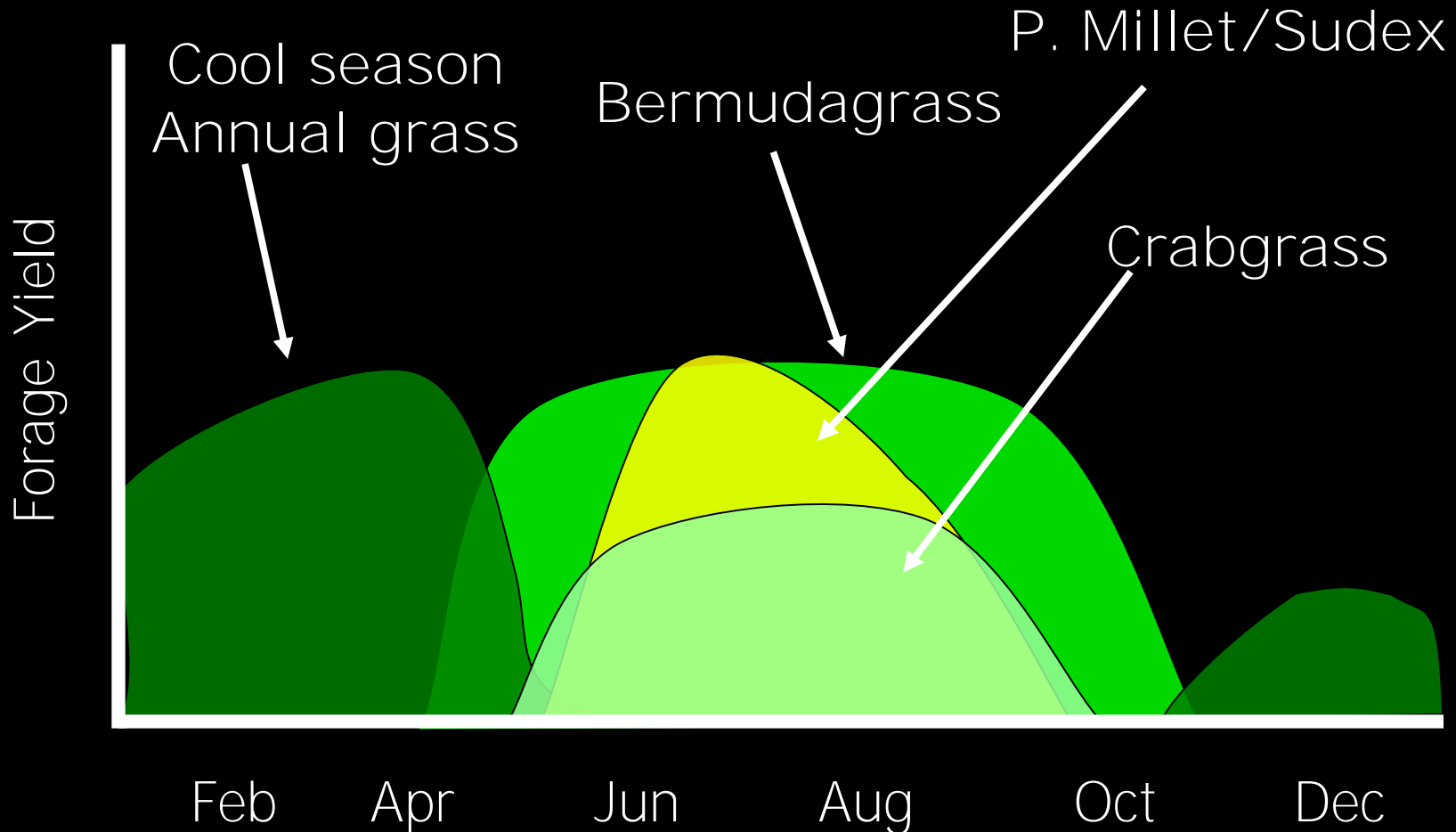


Summer Annual Forage Management for Pasture- Based Dairies



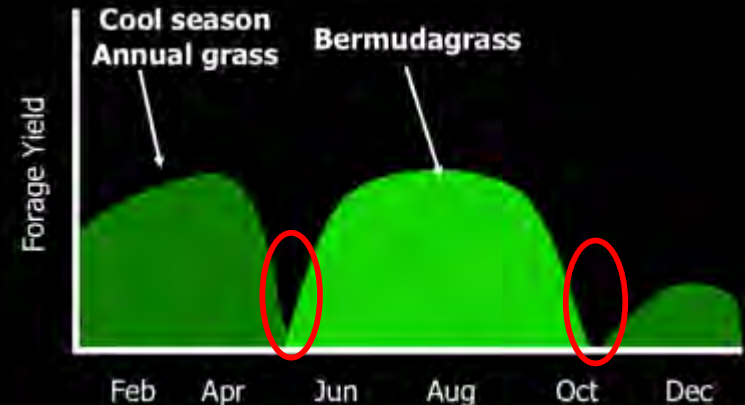
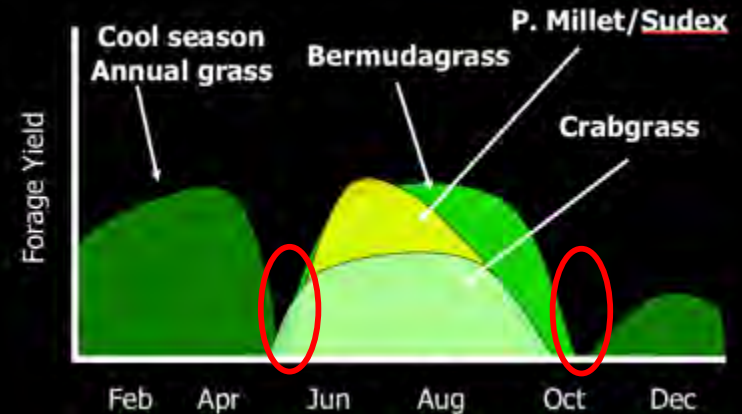
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Forage Distribution in the Southeast



Dual Forage System

- Using both in some proportion:
 - 50%:50%
 - 60%:40%
 - 75%:25%
- Eases the transitional periods
- Proportion (ratio) depends upon calving/breeding timing



A photograph of a field with two distinct rows of green, leafy grasses. The grasses are tall and have long, narrow leaves. The background shows a green field under a clear sky.

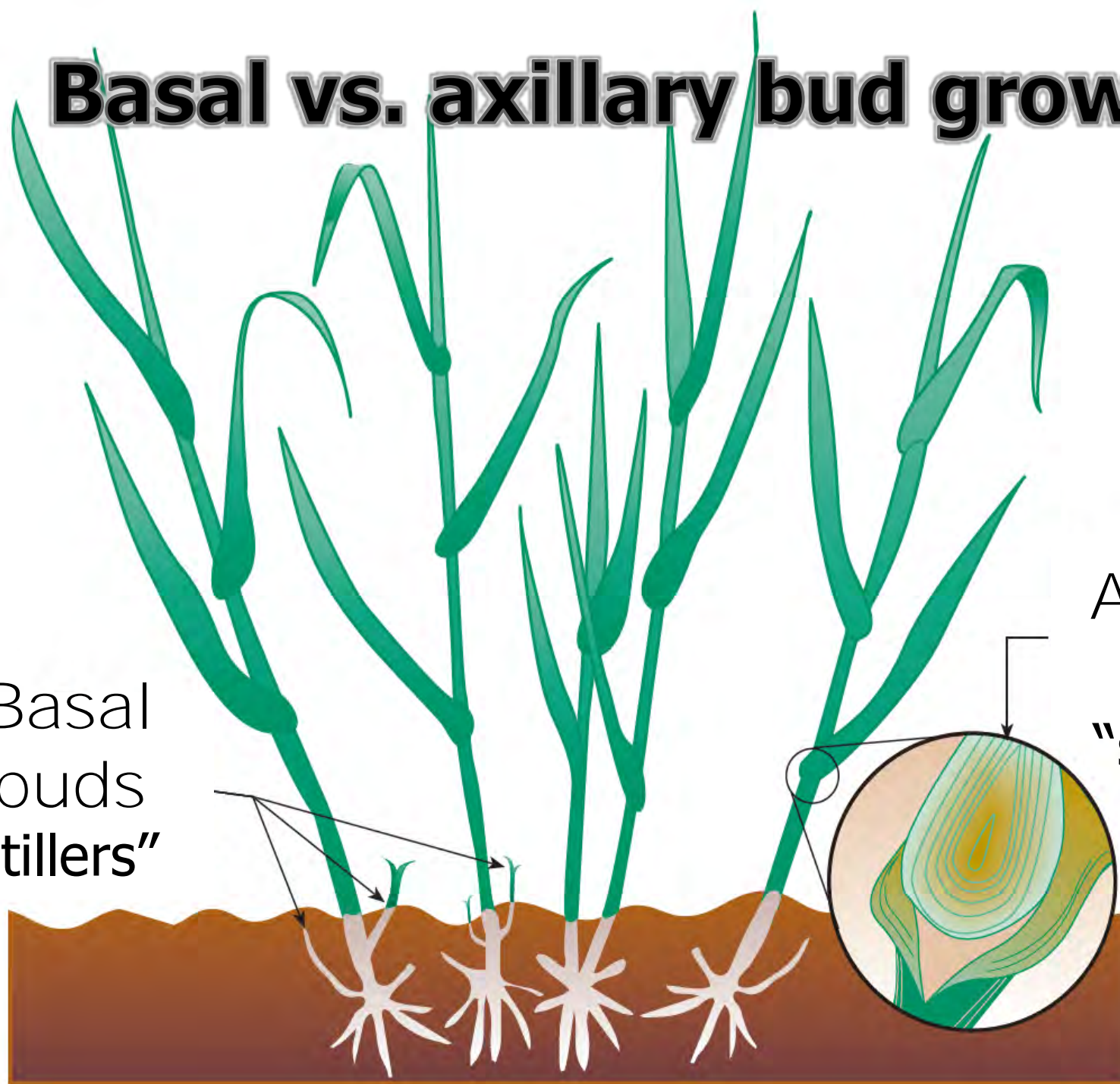
Sorghum x sudangrass
hybrid

Pearl Millet

Warm Season
Annual Grasses

Basal vs. axillary bud growth

Basal
buds
"tillers"



Axillary
buds
"suckers"

Axillary bud regrowth in sorghum x sudangrass.



Basal bud “tillering” in pearl millet.



Sorghum x sudan

- **High yield potential**
- **High quality**
 - **Brown mid-rib (BMR) hybrids**
- **Prussic acid forming potential**
- **Harder to manage under grazing**

A photograph of a lush green field of Pearl Millet. Several black cows are grazing in the field. One cow in the foreground is prominently featured, facing left. In the background, two more cows are visible, one facing left and one facing right. The text 'Pearl Millet' is overlaid in white with a black outline at the top center of the image.

Pearl Millet

- **More productive in drought conditions**
- **Can develop toxic nitrate levels**
- **No prussic acid toxicity concerns**
- **Less palatable (alkaloids)**
- **BMR trait (?)**
- **Easier to manage under grazing**
 - **Irrigated pasture**

Differences in Forage Quality

| Forage Characteristic | Forage Sorghum ¹ | Pearl Millet ² | Tropical Corn ³ | SEM |
|-----------------------|-----------------------------|---------------------------|----------------------------|------|
| | ------(%)----- | | | |
| NDF, % of DM* | 63.6 | 61.8 | 54.5 | 0.59 |
| WSC, % of DM* | 14.6 | 9.9 | 20.7 | 0.42 |
| pH | 4.09 | 4.50 | 3.96 | 0.06 |
| Lactic Acid, % of DM | 5.61 | 3.33 | 4.42 | 0.32 |
| Acetic Acid, % of DM | 6.78 | 3.97 | 3.93 | 0.41 |
| DM Digestibility, % | 56.8 | 51.4 | 58.1 | 1.47 |
| DM Intake, lbs/d | 8.7 | 9.5 | 8.6 | 0.14 |

1) 'NK 300'; 2) 'Pennleaf'; 3) 'X304C'

* Measured prior to ensiling

Adapted from Ward et al. 2001.
J. Dairy Sci. 84:177–182

In the pre-boot stage, when most grazing will occur, the digestibility of SxS and PM are similar.

Effect of Growth Stage on 24 and 48-hr DM Digestibility of Pearl Millet and Sorghum x Sudangrass

| Growth Stage | DM Digestibility | |
|------------------------|-------------------------|--------------|
| | 24 hr | 48 hr |
| P. Millet, pre-boot | 61.7 a | 76.3 a |
| S x Sudan, pre-boot | 63.1 a | 76.3 a |
| S x Sudan, early bloom | 55.2 b | 65.5 b |

Adapted from Hoveland et al. 1967. Auburn Univ. AES Report. Leaflet 76.

When grazed in the pre-boot stage, SxS and PM are more or less equal.

Effect of N Rate on Pre-Boot P. Millet and S. x Sudangrass Forage Yield



Notice that there is little N response when kept (grazed) in the pre-boot stage.

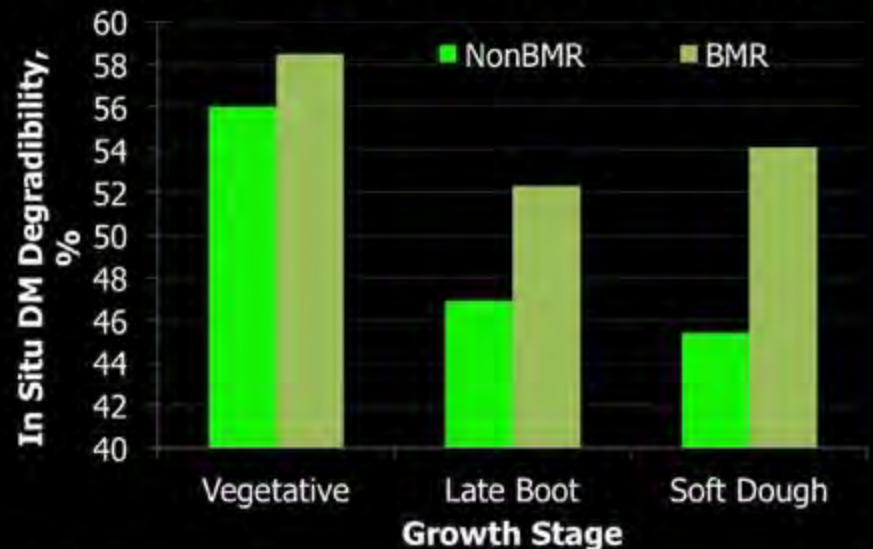
N Rates represent seasonal totals with each N treatment equally split into 4 applications, one per month. Adapted from Hoveland et al. 1967. Auburn Univ. AES Report. Leaflet 76.



Digestibility of SxS and BMR SxS decreases with maturity.

But, the decline in BMR quality is not as steep.

Digestibility of S x S Decreases With Maturity More in NonBMR than in BMR



Adapted from Beck et al., 2007 J. Anim. Sci. 2007. 105:545-555.

Genetic Traits

| Trait | Description and Significance |
|-------|--|
| BMR | Brown midrib, reduced lignin content and higher forage digestibility |
| PPS | Photo-period sensitive, delay flowering provides flexibility in harvest management |
| BD | Brachytic dwarf increases the leaf to stalk ratio by shortened internode distance |
| MS | Male sterile produce no grain and thus sugar and protein stay in leaves |
| DS | Dry stalk is dry at boot stage for direct harvest |



Drill narrow or plant on wide row spacings. It doesn't seem to matter.

Quality and Animal Performance when Pearl Millet was Drilled on Narrow Rows or Planted on Wide Rows

| | Conventional drill, 10" row spacing, 25 lbs seed /acre | Grain Planter, 36" rows, 5 lbs seed/acre |
|-----------------|--|--|
| CP, % | 25.4 a | 22.6 b |
| TDN, % | 74.0 a | 71.7 b |
| IVDMD, % | 77.2 a | 75.0 a |
| ADG, lbs/head/d | 1.49 a | 1.45 b |
| Gain/acre, lbs | 478 a | 454 b |

Adapted from Hill et al. 1999.
J. Prod. Agric. 12:578-580.

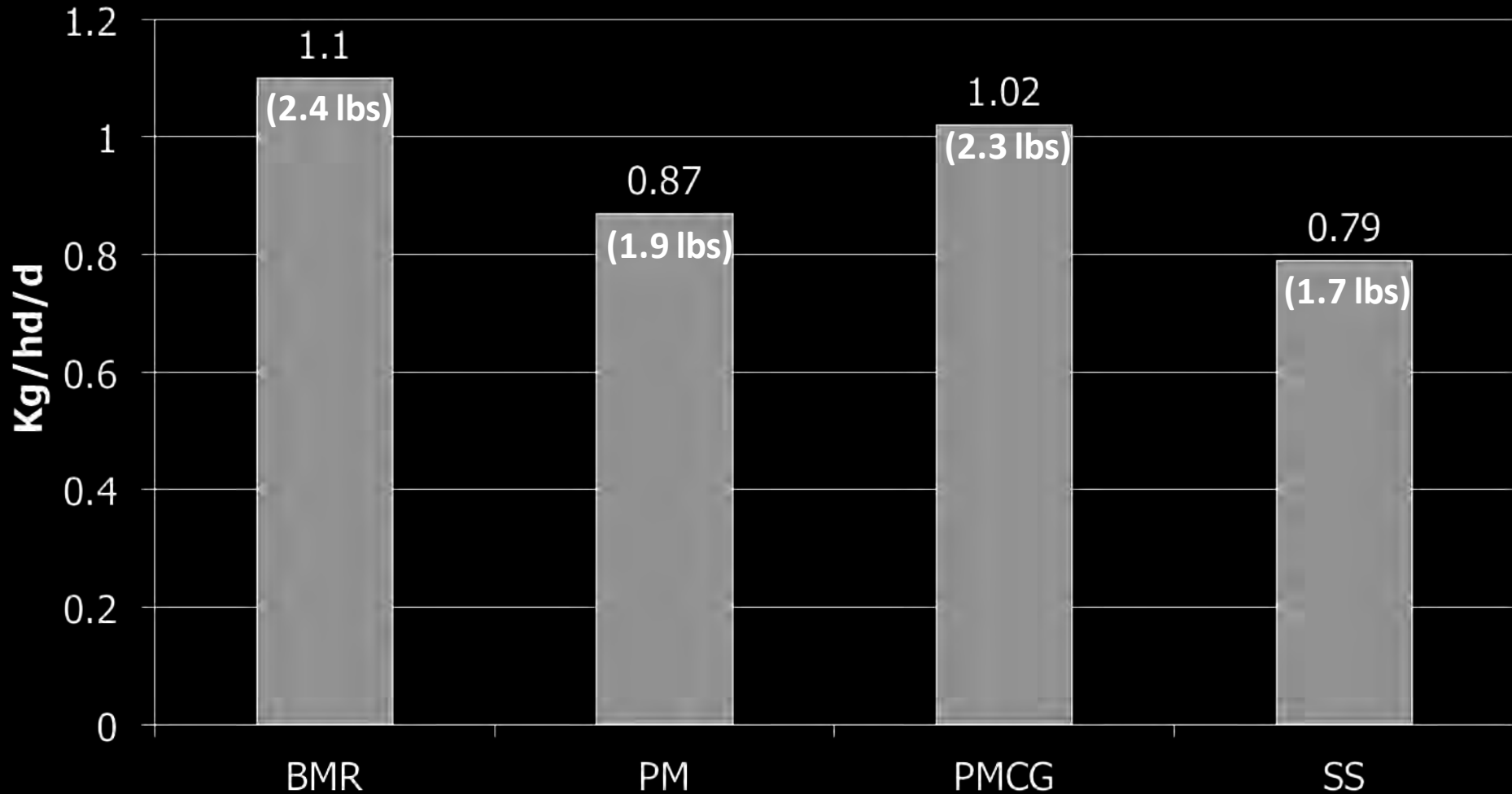
Crabgrass

| | |
|----------------------|--|
| Adaptation | Warm climates of the southeastern U.S. Tolerates poor drained soils. Not drought tolerant. |
| Qualities | Easy to grow, fills in gaps in the field. 4000-7000 lbs DM/acre |
| Establishment | Seed should be drilled 1/4 in. deep at 4 - 6 lb/acre or broadcast at 4 - 6 lb/acre in March - May. |
| Varieties | Red River, Quick and Big, Mojo |



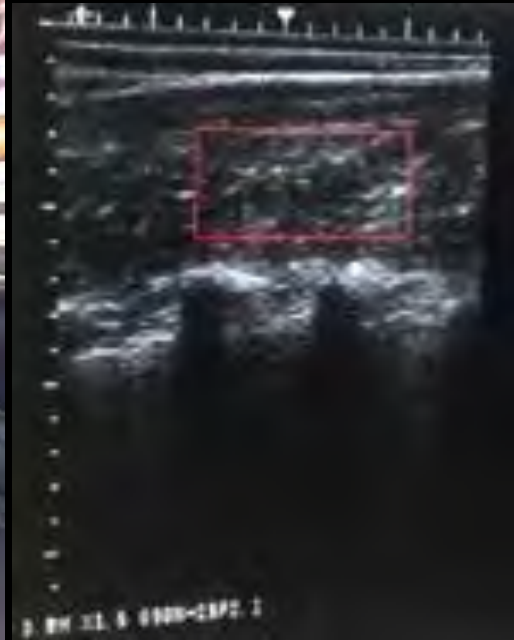
Results: Animal Production

Average Daily Gain



$P = 0.30$

Results: Animal Production



- No difference was observed between treatments in regards to final bw, total bw gain, and ultrasound-assessed responses (Ribeye area, fat thickness at the 12th Rib and on the rump, and intramuscular fat percentage)



Leaf rust (top) and leaf spot diseases (bottom) can substantially decrease yield and quality.



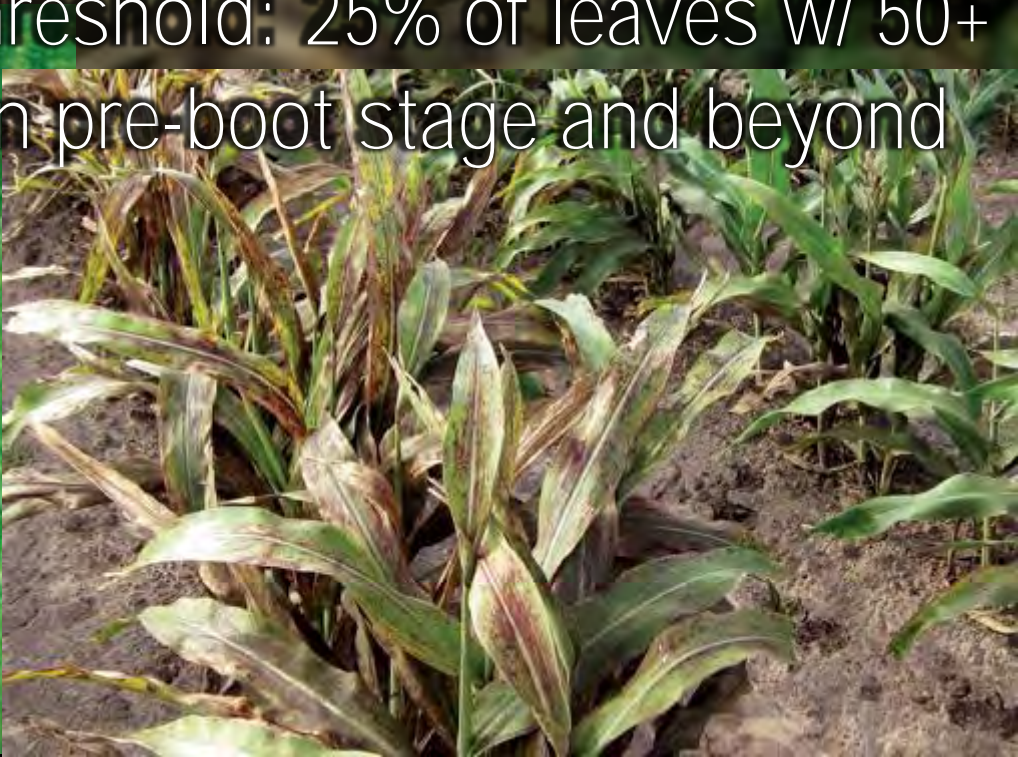
Leaf Rust Reduces Yield, Digestibility, and Sugars, but Increases Protein

| | Yield | IVDMD | CP | Total Sugars |
|---------------------|--------------|--------------|-----------|---------------------|
| Leaves | -36.4% | -17.8% | 10.0% | -48.3% |
| Stems | -36.9% | -4.2% | 14.6% | -75.8% |
| Total Forage | -36.8% | -7.3% | 12.1% | -64.4% |

Adapted from Monson et al. 1986. Crop Sci. 26: 637-639.

White Sugarcane Aphid Damage on Sorghums

- Attacks everything in Sorghum family
 - (inc. FS, SxS, Sudangrass, and Johnsongrass)
- Yield losses 50-80%+
- Treatment threshold: 25% of leaves w/ 50+ aphids/leaf in pre-boot stage and beyond





White Sugarcane Aphid Damage on Sorghums

Insecticide Options:

- Sivanto (*flupyradifurone*) labeled in some states
 - Rate of 4.0-7.0 oz./acre
- Section 18 label (GA) for Transform WG (*sulfoxaflor*)
 - Rate of 1.0-1.5 oz/acre is about 90% effective
- Pyrethroids are not recommended. Can kill beneficials and cause SCA pop to flare.

QUESTIONS?



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