Alfalfa-Bermudagrass Mixtures in the Southeast, US

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Alfalfa Bermudagrass as Baleage

Comparison of yield and quality of T85 bermudagrass and T85+ “Bulldog 805” Alfalfa when harvested as baleage

T. Hendricks, Ph.D

Tifton, GA 2016-2018

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Establishment and Management

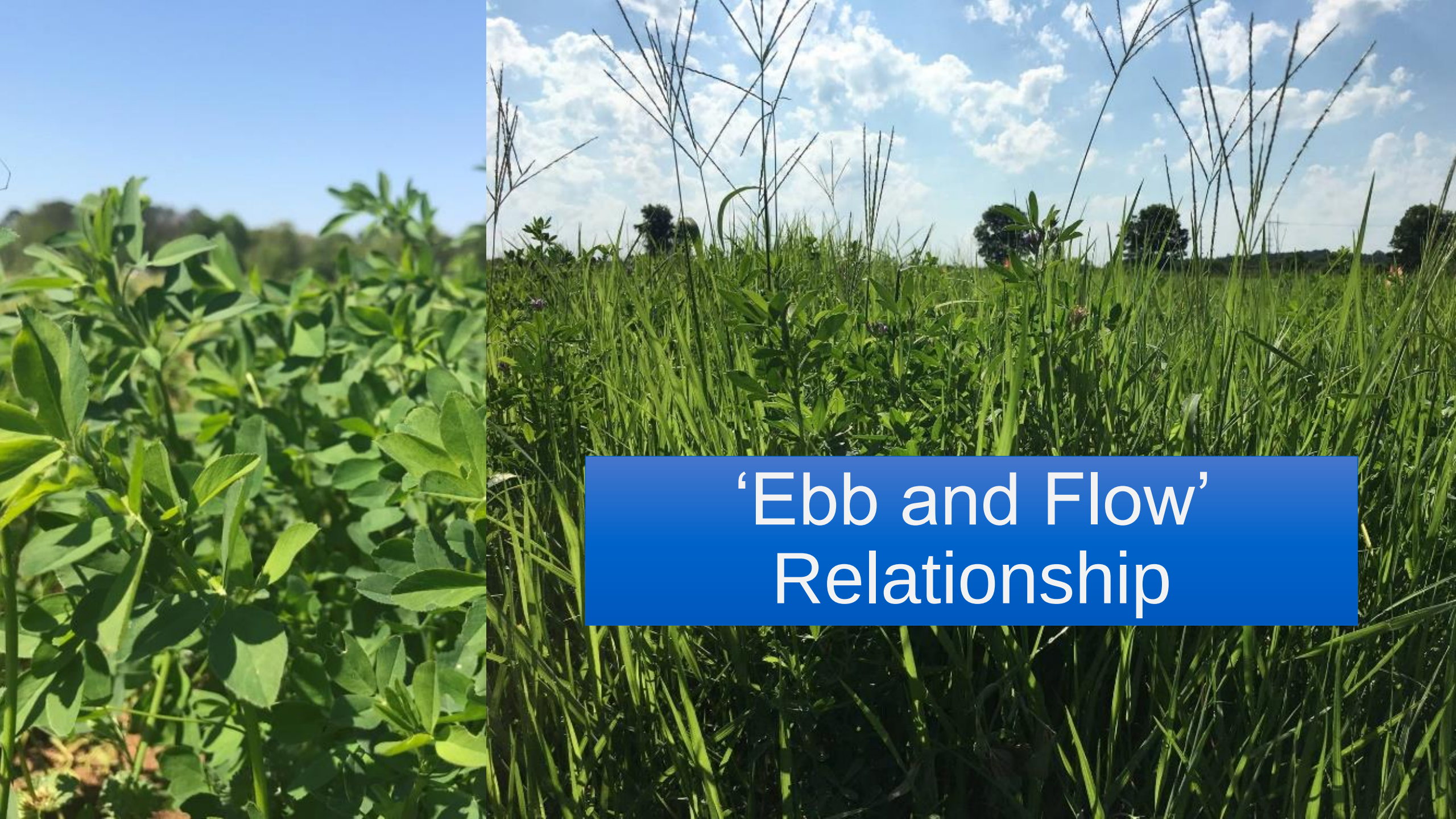
- Existing ‘Tifton 85’ bermudagrass
- Interseeded with ‘Bulldog 805’ alfalfa ~20 lbs/acre on a 14 inch row spacing
- Alfalfa-bermudagrass mixture harvested at 10% bloom on 28-35 day interval
  - First harvest of new planting shoot for 25% bloom




Baleage is a Southeastern Game Changer

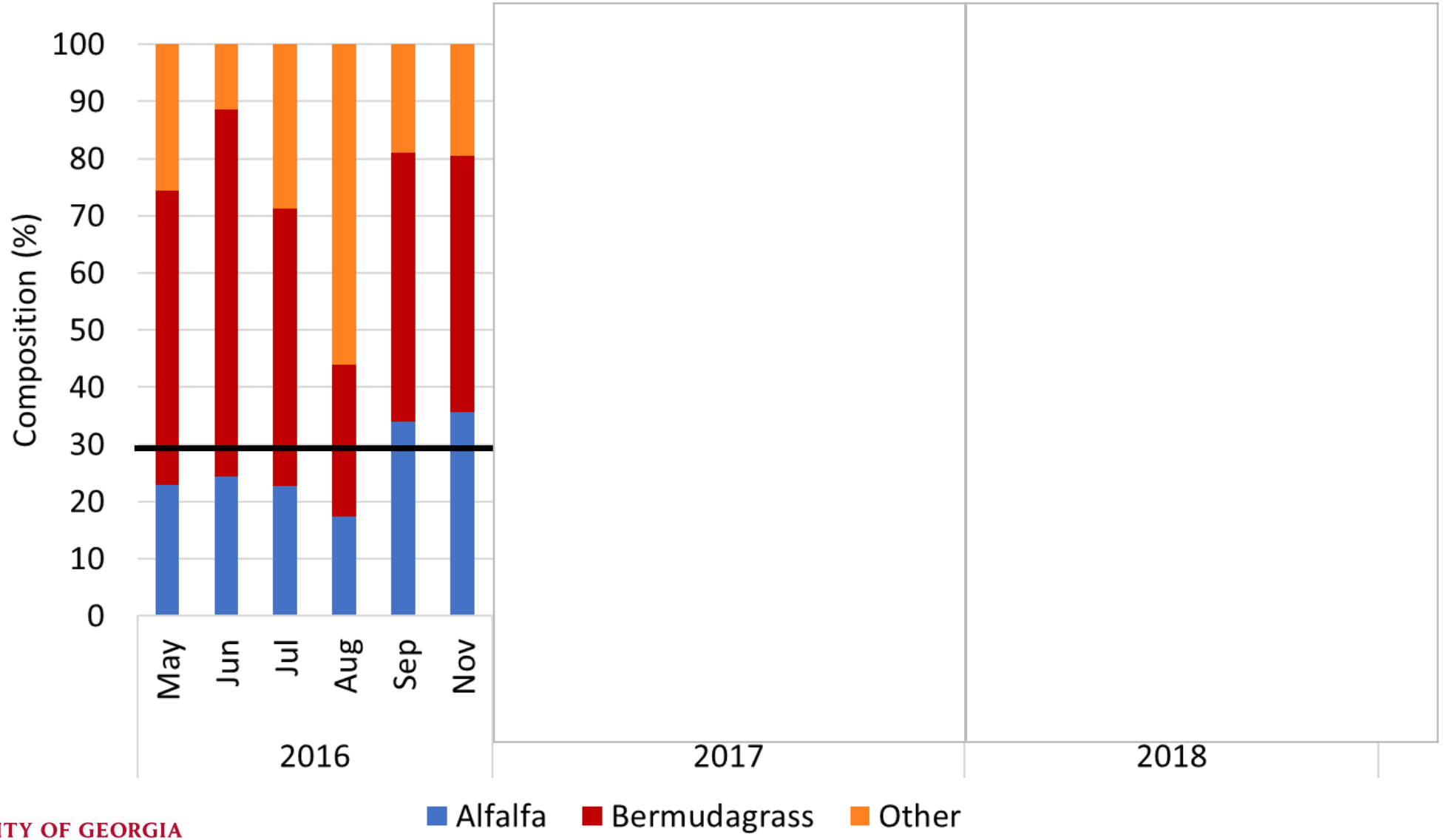
- Minimizes weather factors
  - Easier to maintain timely harvest interval
- Improves forage quality parameters
  - Lower ADF, NDF, ADL
  - Increased palatability

- Mowing occurred at ~6:00pm in the evening
- Raked and baled at target ~55% moisture (40-60% range)
- Wrapped immediately after baling – all in one day!



‘Ebb and Flow’ Relationship

Botanical composition of Alfalfa-Bermudagrass baleage 2016-2018.
Tifton, GA



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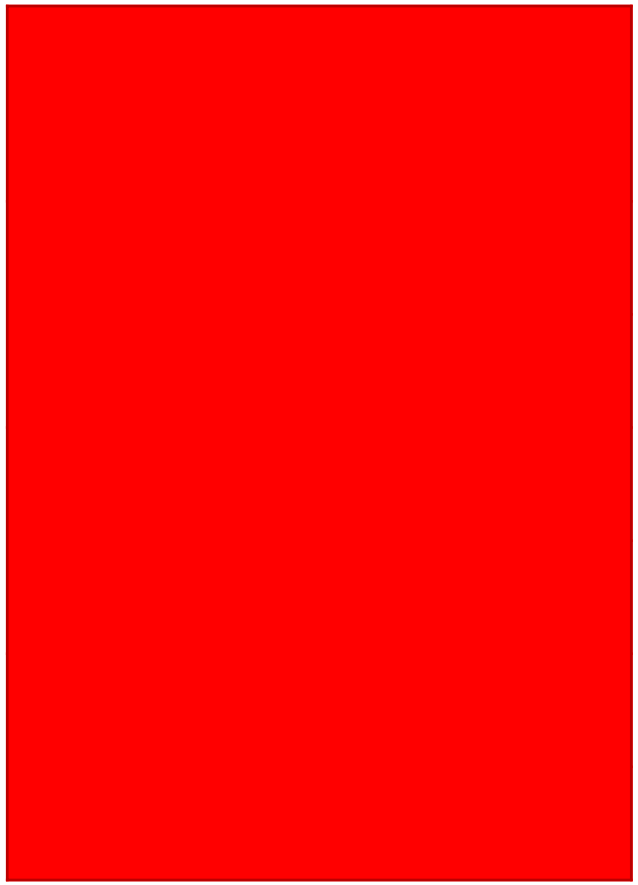
Advantage: Mixture

		Number of Harvests
2016	T85	4
	T85+Alf	**6**
2017	T85	4
	T85+Alf	**8**
2018	T85	4
	T85+Alf	**7**



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How long will alfalfa last in an ABG baleage system?

	2016	2017	2018	2019	2020	2021
Number of Harvests	6	8	7	6	6	?
Tons per acre	7	10	9	5.3	6.5	?

Alfalfa as a Nitrogen Source in Grazing Systems

Comparison of T85 bermudagrass pastures with or without nitrogen to alfalfa/bermudagrass mixtures for stocker steers

J. Burt, Ph.D Student

United States Department of Agriculture
National Institute of Food and Agriculture

Tifton, GA 2018-2019

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Treatments and Management

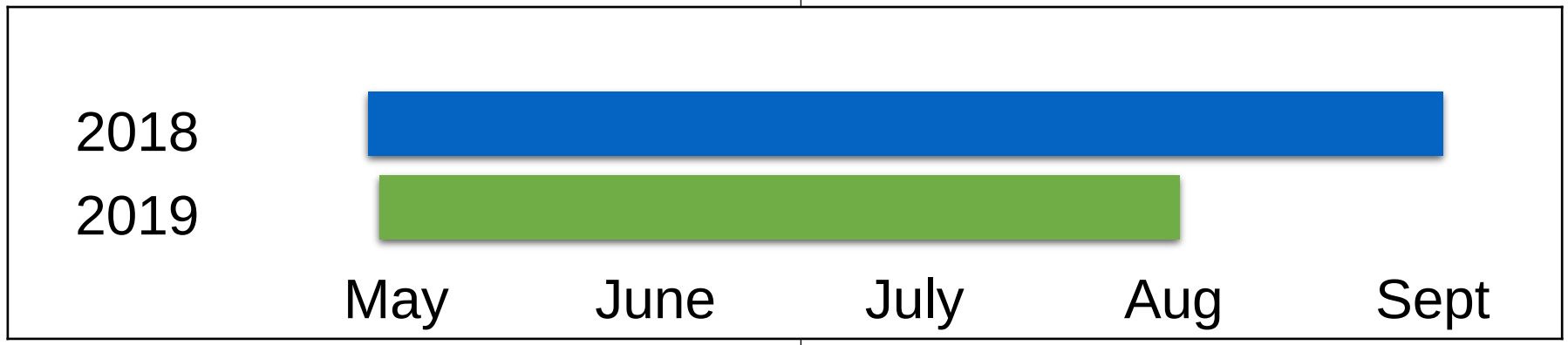
- BGA: interseeded with “Bulldog 805” alfalfa
- BG+N: received 80 lbs/acre (CAN) split applied twice per season
- BGO: Bermudagrass with no N additive

- Grazed 4-5 weight “stocker” steers
- Rotational grazing
  - 2 acre paddocks split into 3 sections
  - 7 to 10 day rotation and 14 to 20 day rest period per section

Completely Temporary System

Total Days of Grazing

Year 1	Year 2
May 19 – Sept. 17, 2018	May 20 - August 14, 2019



122	87

Average Daily Gain

Year	Treatment	BG	BG+N	BG+A	SEM
	Month	lbs			
2018	May-June	**2.5^{a}**	2.2^{b}	**2.6^{a}**	0.05
	June-July	0.9	1.2	1.3	0.13
	July-Aug	0.6	0.6	0.6	0.34
	Aug-Sept	**1.4^{a}**	1.0^{b}	**1.9^{a}**	0.15
2019	May-June	1.9	2.1	2.3	0.17
	June-July	2.4	2.2	2.9	0.25
	July-Aug	2.2	2.1	2.7	0.36

Average daily gain (lbs.) within year and period by treatment.
*Bold numbers greater at α=0.05

Gain/Acre Stocking Rate

Year	Gain/Acre					Stocking Rate			
	Treatment	BG	BG+N	BG+A	SEM	BG	BG+N	BG+A	SEM
	Month	lbs/acre				lbs liveweight/acre			
2018	May-June	154.0^{b}	138.0^{b}	**342.5^{a}**	36.13	644.0^{b}	644.0^{b}	**1233.9^{a}**	21.44
	June-July	114.0	135.5	88.0	37.96	1123.7^{b}	1149.1^{b}	**1497.3^{a}**	39.03
	July-Aug	77.0	74.5	78.0	33.02	977.4^{c}	1283.7^{b}	**1495.2^{a}**	10.24
	Aug-Sept	136.0	141.5	262.0	27.28	1123.0^{b}	**1436.7^{a}**	**1631.7^{a}**	51.38
2019	May-June	108.0	122.5	131.5	10.41	491.2	483	520.8	18.79
	June-July	133.5^{b}	**204.0^{a}**	**212.0^{a}**	8.35	545.5^{b}	**821.6^{a}**	**832.6^{a}**	20.89
	July-Aug	123.0	116.0	149.0	19.30	612.7	603.0	677.2	35.00

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Gain/Acre Stocking Rate

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	July-Aug	123.0	116.0	149.0	19.30	612.7	603.0	677.2	35.00
Average Seasonal Gain		213^{b}	233^{b}	**342.2^{a}**	31.36				

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Advantage: Mixture

CONCLUSION

Alfalfa/bermudagrass mixtures are a viable option for southeastern stocker cattle producers - especially those looking to reduce dependence on synthetic N sources

IMPLICATIONS

Rest periods were not long enough to sustain forage productivity and animal performance during drought.

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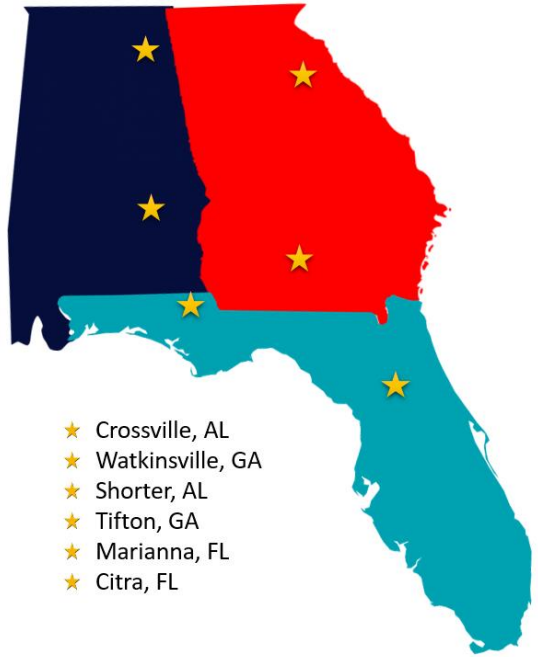
Development of Grazing Recommendations and On-Farm Decision Tools for Managing Alfalfa-Grass Mixtures in the Southeastern U.S.



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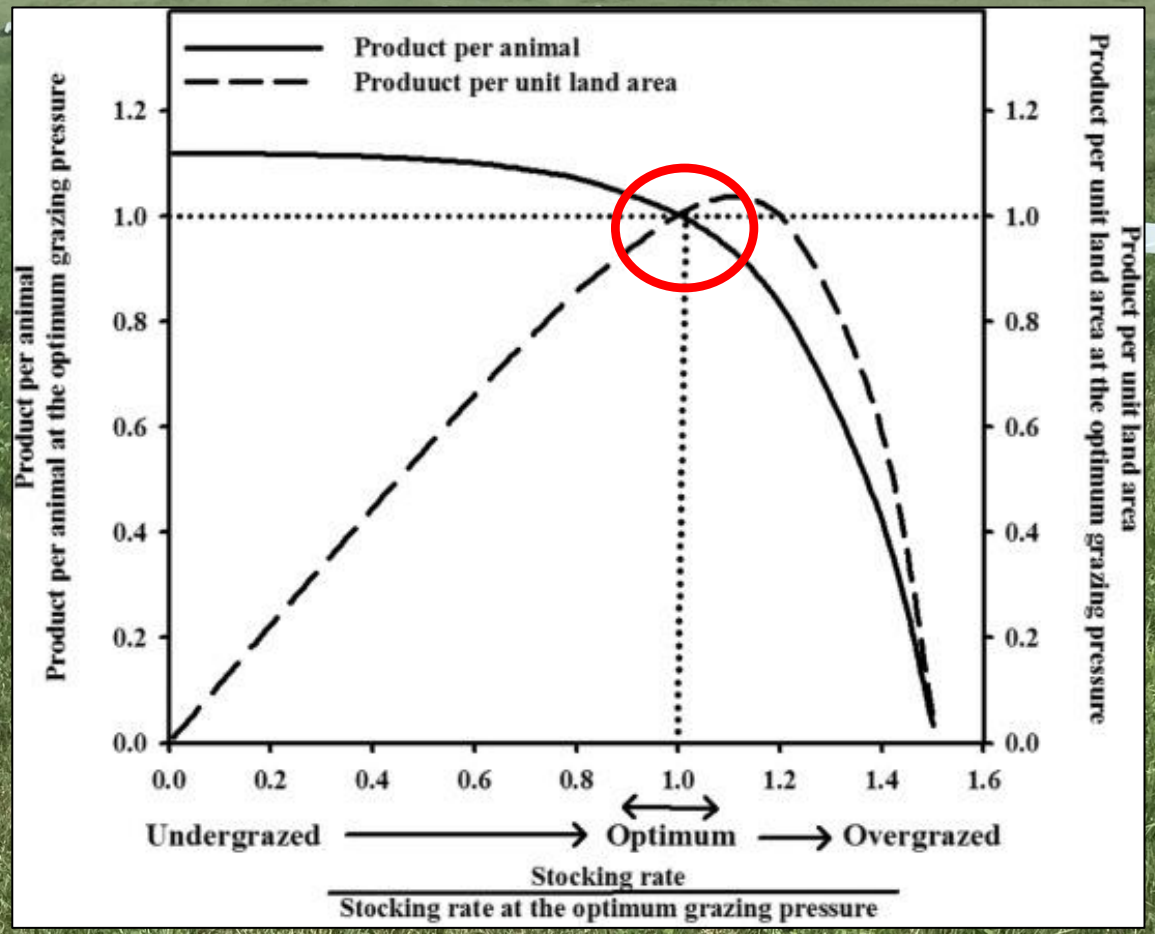
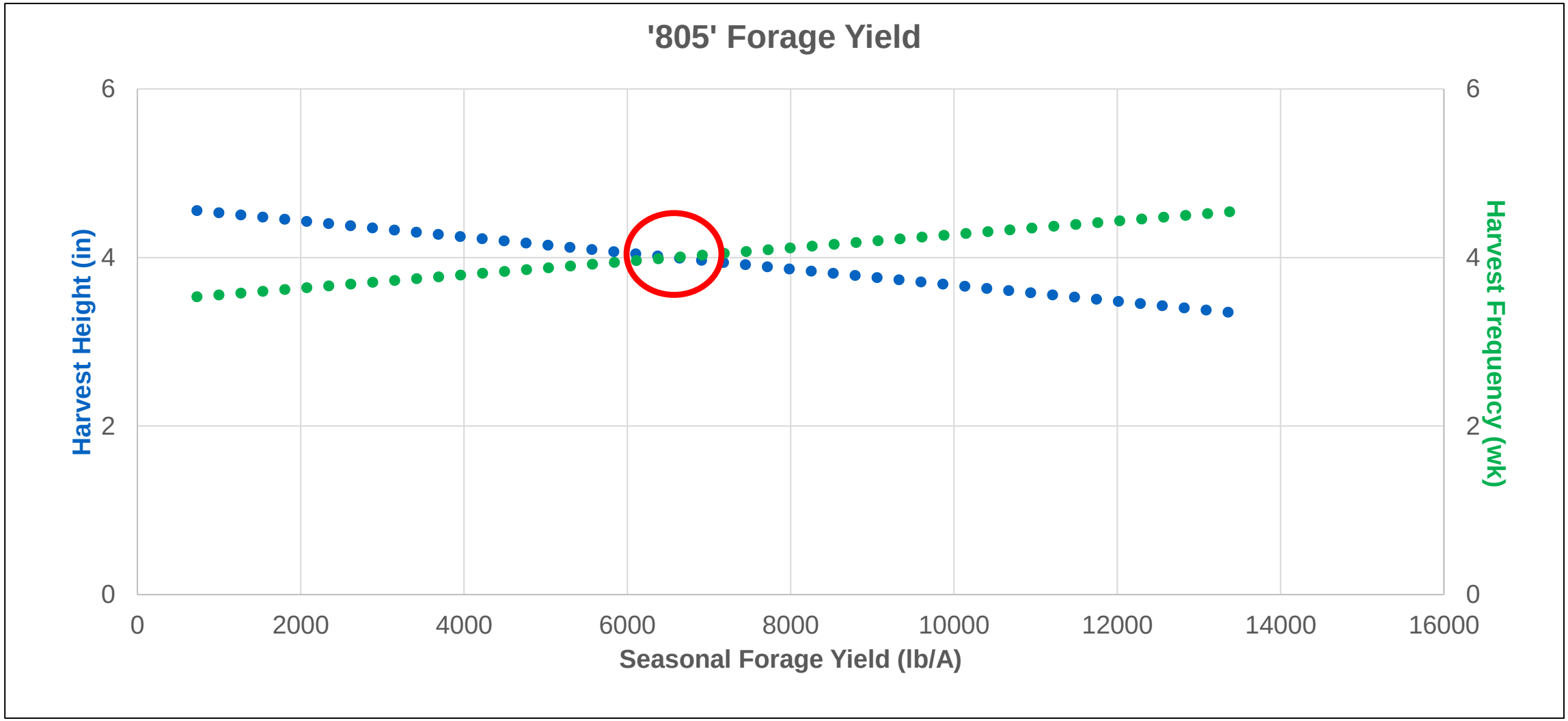


Mott et al.1973

By focusing on **stubble height** and **rest period**, we hope to **optimize** forage yield, quality and stand longevity.

Optimum Forage Yield: ABG with 805



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2 years of data: Shorter, AL and Tifton, GA

Alfalfa Stand Persistence

Tifton, GA

September 26, 2018

January 16, 2019

May 2, 2019

October 31, 2019

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Conclusion

When grazing alfalfa-bermudagrass mixtures, leaving a **4-inch** stubble height and allowing it to rest for **28-30 days** will allow for **optimum** yields, nutritive value, and alfalfa stand persistence.

Evaluating Alfalfa Bermudagrass Systems under contrasting defoliation management strategies in the Southeast U.S.

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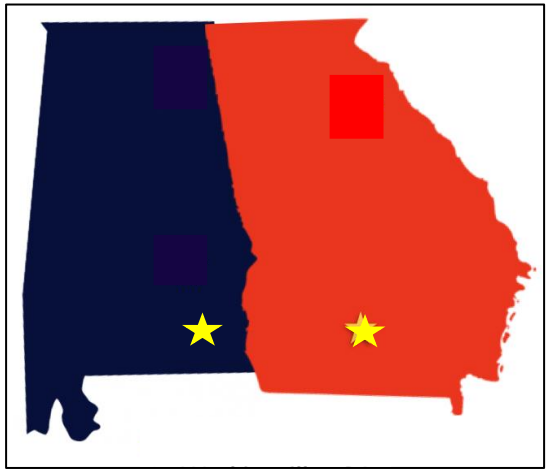

NIFA AFRP # 2019-70005-30360

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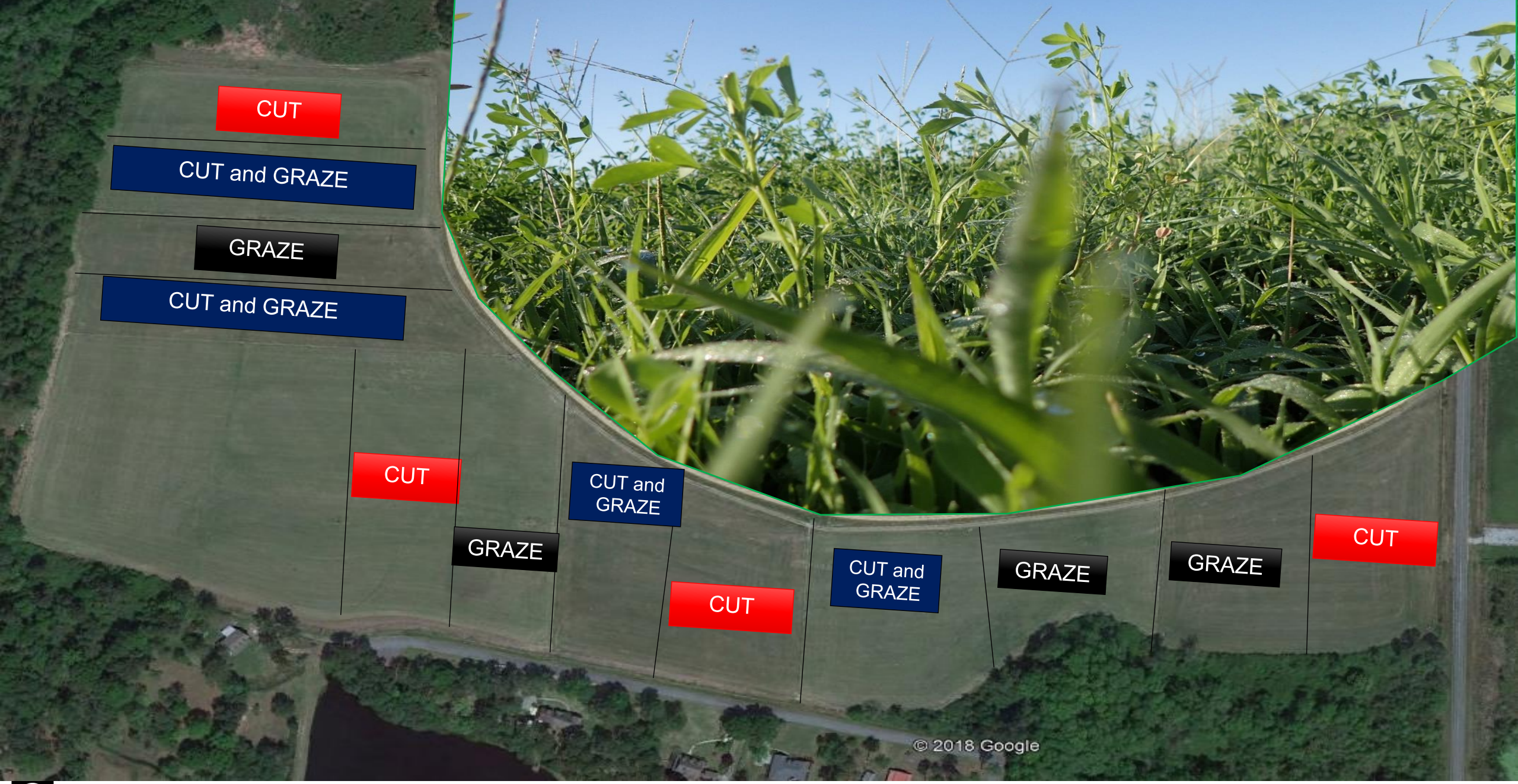

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"Bulldog 805" established in T85 or Russell BG @ Better Grazing Program – Tifton, GA

Grazing:

- 2.5 acre paddock with 4 splits
- Each section grazed for 7 days
- 28 days rest

Baleage

- Harvested at 10% bloom
- 28-35 day interval
- Target 55% moisture

Stockpile grazing

- Strip grazing – with small sections allocated for 2-3 days of forage based on animal body weight and expected intake
- Frontal grazing was not an option as alfalfa regrowth was noticeable after three days of rest post grazing

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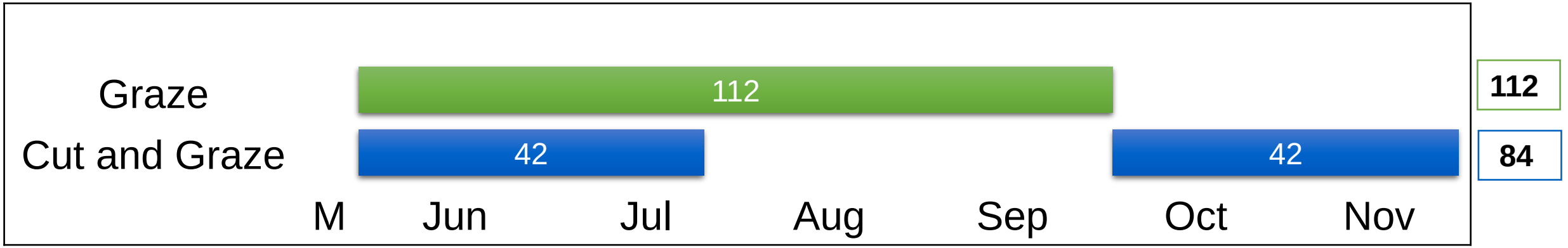
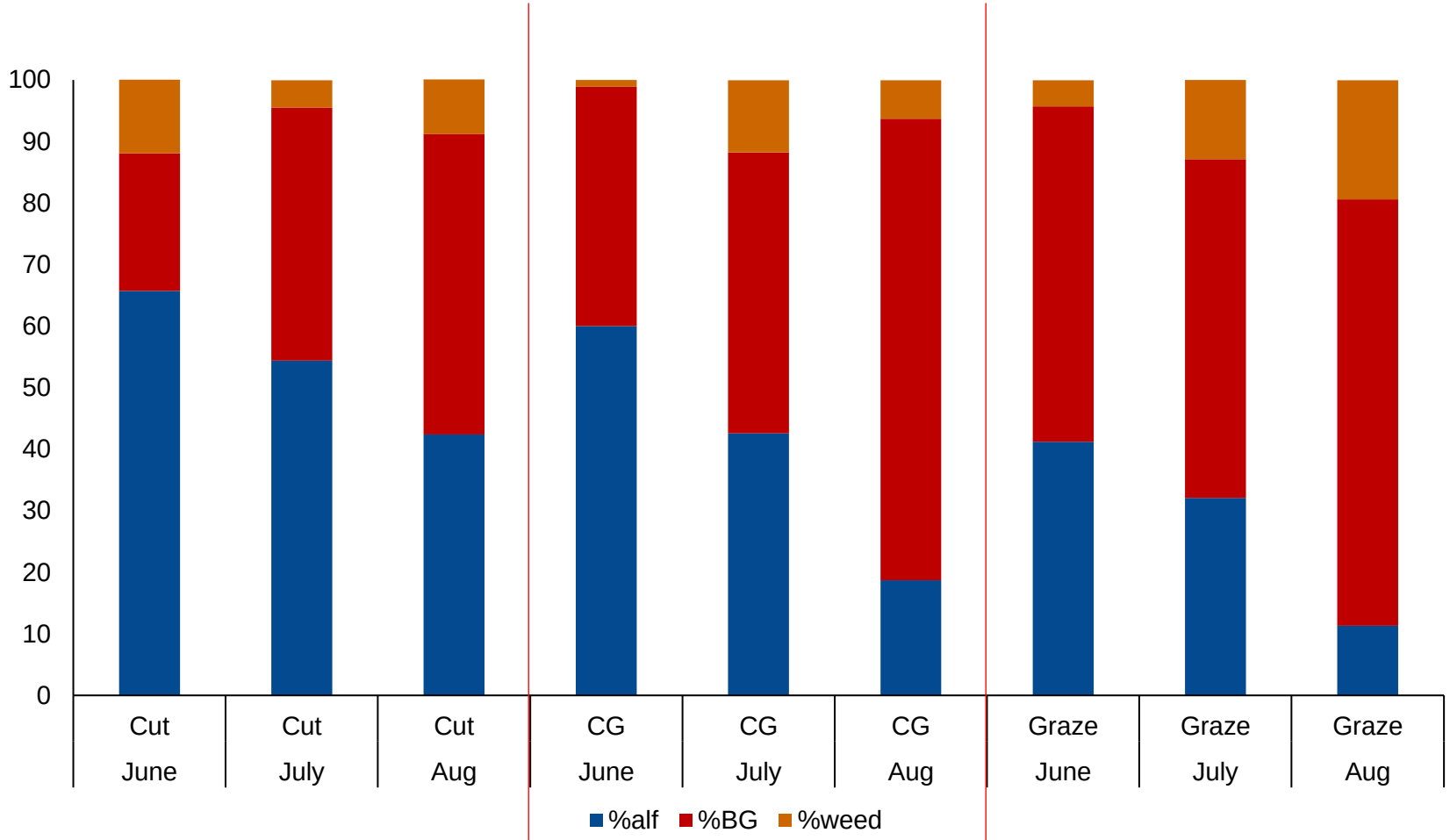
Preliminary Data (2020 Tifton, GA)

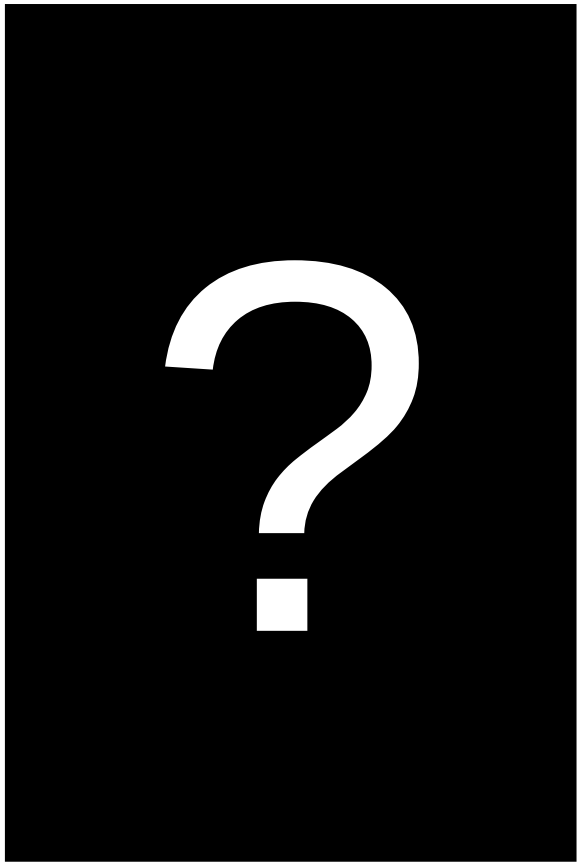


- Average Daily Gain fluctuated throughout the season
- ~1.5 to 2 lbs/day
- Stockpile gains were ~0.5 lb/day

- Preliminary animal data follows to recent work at both locations with stockpiled BG and grazing ABG mixtures in the summer

Botanical Composition (Year 1 - 2020)





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Year 2 is Off and Running!

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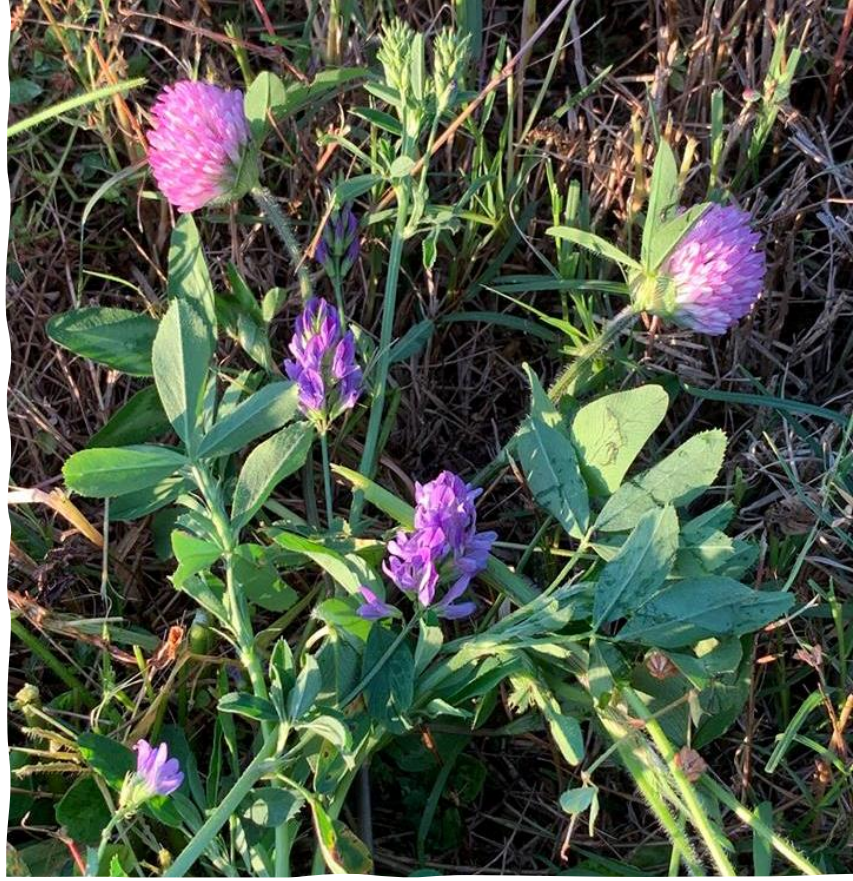
Additional Alfalfa projects:

- Restoring Grasslands with the Addition of Alfalfa in an effort to Sustainably Increase Alfalfa Production in the Southeast
  - Evaluating interseeding alfalfa into existing Tall Fescue and Bermudagrass sods in the spring and fall – with the addition of crabgrass
  - Two locations in GA and one in TN
- Comparing legume options in bermudagrass for baleage production
  - Evaluating red clover – bermudagrass yield and quality to alfalfa-bermudagrass mixtures
- Next step evaluations of ABG mixtures to answer producer questions
  - Can you overseed alfalfa into existing ABG stands: what about autotoxicity?
  - How long after “killing” the alfalfa must you wait to replant it in a mixture?



Considering planting Alfalfa?

Don’t forget to refer to the Alfalfa in Bermudagrass Checklist

http://www.secattleadvisor.com/2019/04/15/alfalfa-in-bermudagrass-checklist/

Alfalfa in Bermudagrass Checklist

Selecting the Area:

- ✓ **Soil Test** – Target pH should be 6.5 or greater and subsoil pH (~1 ft below soil surface) should be 5 or greater. Phosphorous (P) and Potassium (K) levels should be in at least the medium range, and micronutrients Molybdenum (Mo) and Boron (B) are very important in Alfalfa production.
- ✓ **Soil Type** – Be sure to select an area with a well-drained, deep, and fertile soil. Avoid areas that tend to hold water for long periods of time. Just like bermudagrass, alfalfa does not like to have “wet feet”. Poor drainage can be detrimental to alfalfa stands.
- ✓ **Prior Weed Control** – Avoid areas that have had broadleaf chemistries with residual soil activity applied within the last year (i.e., GrazonNext and Pastora).

Prior to Planting:

- ✓ **Secure Seed** – Consult your local extension agent and review regional alfalfa variety test results to select a variety suitable for growth in your area. Not all alfalfas are created equal – selecting the right variety for your location is imperative! Purchase seed well in advance of need.
- ✓ **Apply Fertilizer and Lime** – Based on soil test results, apply fertility to keep soil within the recommended ranges. Do not expect lime to increase soil pH in less than 6-8 months.
- ✓ **Suppress Sod** – Bermudagrass should be grazed or mowed very short (1-2 inches) just prior to interseeding with alfalfa. After cutting, spray with a light rate of a non-selective herbicide (glyphosate) to induce dormancy and suppress the bermudagrass sod. **This will not kill your Bermudagrass**, rather it will induce dormancy (“put it to sleep”). This is a very important step! If skipped, greater challenges and potential alfalfa stand failures are likely.
- ✓ **Plant** – Using a calibrated no-till drill, plant alfalfa directly into bermudagrass sod. Plant **no deeper than ½ inch!** Alfalfa is a small seed, so err on the shallow side. Stand failures due to improper planting depth are common, especially in sandier soils. Recommended seeding rate of alfalfa is 20-25 lbs/acre, however if interseeding on a wider row spacing (i.e. 14-15 inch vs 7-8 inch) you can decrease the seeding rate to 12-15 lbs/acre.
  **Note: *Most alfalfa seed comes pre-inoculated, however it is always good to check to make sure prior to planting your material!*

After Emergence:

- ✓ **Insect Pest Management** – Immediately after alfalfa emergence, spray with insecticide (i.e. Mustang Max or Karate) to control mole crickets and other insect pests that may damage young alfalfa plants over winter.
- ✓ **Weed Pest Management** – If using an alfalfa with RR technology, use glyphosate as necessary to control winter weeds and re-induce dormancy of bermudagrass in unusually warm winters. Once alfalfa is established, pre-emergent technologies are recommended to help combat common volunteer annual weeds (i.e. annual ryegrass, crabgrass).

USDA
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