UF/IFAS Range Cattle Research and Education Center

Field Day and 'Mislevy' Bermudagrass Release Announcement

October 24, 2019

In memory of Dr. Elver M. Hodges

August 2, 1912 – September 25, 2019

Dr. Elver Hodges did extensive testing on many grasses, legumes and other forages which ultimately benefitted Florida cattlemen. Through his 39 years (1941-1980) of service through the University of Florida, at the Range Cattle Experiment Station, he worked diligently to develop and release improved forages and new management techniques, which when implemented by Florida cattlemen, greatly improved the value of their operations.

In 1942, grasses were brought in with the assistance of the USDA. One of those grasses was 'Pangola' digitgrass, which was found to do well when copper was added to the soil, and if properly managed. Research was done on the grass at Ona by Dr. Hodges which eventually lead to it becoming a valuable forage.

Dr. Hodges felt his greatest achievement at the center wasn't that he revolutionized beef cattle production in Florida through his research, which is what he is certainly well known for. He felt that the greatest achievement was that the faculty at the Range Cattle Experiment Station worked together on projects related to the cow pasture business. That in itself was an achievement and those were the building blocks for the collaborative nature of work at the research center today. Dr. Hodges said in a 2013 interview, "Looking back, I have a better appreciation for what we had done." We probably need to look back more often. Because, Dr. Hodges' words at the end of his interview were "Hey, we've been given a lot"! Take a look into the past with Dr. Hodges, watch the complete interview at https://youtu.be/0vFBlgY2r0c)

At today's field day in memory of Dr. Hodges and his 39 years of service at the Center, you will see 39 pots of Pangola digitgrass.

Table of Contents

Thank You to Our Field Day Sponsors

Upcoming Events

Schedule of Events

8:00 a.m. **Check in/Register**
Visit sponsor and program booths and view student posters

<u>Moderator, Lauren Butler, UF/IFAS Extension Okeechobee County</u>

9:30 a.m. **Welcome Message & Special Remarks —**

Brent Sellers, Professor & Interim Center Director, UF/IFAS Range Cattle REC
Jerry Fankhauser, Asst. Director, Florida Agricultural Experiment Station
Matt Pearce, President, Florida Cattlemen's Association

Faculty Presentations

Using fire! How much does it influence cattle grazing behavior
Raoul Boughton, Rangeland Wildlife and Ecosystem

Exploring long-term trends in beef cattle markets
C*hris Prevatt, Livestock and Forage Economics*

'Mislevy' a new bermudagrass cultivar released by the UF/IFAS Range Cattle REC
Joao Vendramini, Forage Management

12:00 p.m. **Steak Lunch**
Visit Sponsor and RCREC Program Booths

1:15 p.m. **Field Tour of Beef Enhancement Projects**

Weed management during forage establishment
Brent Sellers, Pasture and Rangeland Weed Management

Nutrition of beef females: Does precalving supplementation pay off?
Philipe Moriel, Beef Cattle Nutrition and Management

Utilization of biosolids for pasture fertilization – research updates
Maria Silveira, Soil and Water Sciences

3:00 p.m. **Adjourn**

Welcome

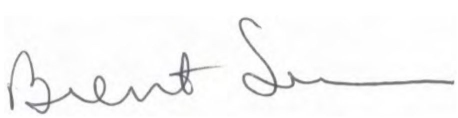
Dear Friends and Colleagues:

It is my pleasure to welcome you to the Range Cattle Research and Education Center for our field day where the highlight is the release of a new bermudagrass cultivar. In addition to this release, I think we have some exciting topics to cover. This morning you will hear from our faculty regarding how fire impacts cattle grazing behavior, and the long-term trends in beef cattle markets. We will end this morning with the official announcement by Dr. Vendramini of our new bermudagrass cultivar named after one of our former forage Agronomists, Dr. Paul Mislevy (#shareyourheritage). After our lunch prepared by the Cloverleaf Foundation of Hardee County, join us on a field tour to hear about some of our beef enhancement projects funded through the Florida Cattle Enhancement Board.

For over a century and a half, in thousands of ways big and small, the University of Florida has helped make Florida a great place to live, work, and play through its core mission of teaching, research, and outreach, and it has played a vital role in helping the United States produce the safest and most plentiful food supply on earth. This was made possible through the signing for the Morrill Act, which created the land-grant university system, of which the University of Florida is a part. This public investment in higher education has made a significant difference in the quality of life for Floridians. Not only did it allow for the education of those who previously had little access to higher learning, but it created a system in which university faculty and researchers share their knowledge and discoveries with the public for the betterment of Florida's communities and economy.

I hope you enjoy the information you hear today and that you are able to implement something you have learned on your ranch or be able to help those who couldn’t be here today. If you have any questions after the event, or after you take this booklet home, please feel free to contact your county Extension Agent or any of us, and we would be very glad to help. #shareyourpassion #shareyourheritage

Best Wishes,



Brent Sellers
Professor and Interim Center Director

UF/IFAS Range Cattle Research and Education Center Faculty

Brent Sellers, Professor &
Interim Center Director
Pasture and Rangeland Weed Management
863-735-1314 ext. 202
sellersb@ufl.edu

Philipe Moriel, Assistant Professor
Beef Cattle Nutrition and Management
863-735-1314 ext. 208
pmoriel@ufl.edu

Raoul Boughton, Assistant Professor
Rangeland Wildlife and Ecosystems
863-735-1314 ext. 216
rboughton@ufl.edu

Maria Silveira, Professor
Soil and Water Sciences
863-735-1314 ext. 209
mlas@ufl.edu

Chris Prevatt, State Specialized Agent II
Beef Cattle and Forage Economics
863-735-1314 ext. 215
prevacg@ufl.edu

Joao 'Joe' Vendramini, Professor
Forage Management
863-735-1314 ext. 205
jv@ufl.edu

Using fire! How Much Does it Influence Cattle Grazing Behavior

Britt Smith, Postdoctoral Research Associate, Range Cattle REC, Ona
Elizabeth H Boughton, Associate Research Biologist, MacArthur Agro-ecology Research Center, Lake Placid and
Raoul K Boughton, Assistant Professor, Range Cattle REC, Ona

Introduction

Around the world, livestock grazing accounts for 25% of total land use and is the most prolific single land use (Anser et al. 2004). Tropical and subtropical grasslands comprise 8 million m^2, or roughly 13.5%, of the world's total land area (Jenkins and Joppa 2009). Livestock grazing is commonplace in tropical and subtropical grasslands. These grazingland agroecosystems are globally important for economic productivity, food security, and biodiversity. Finding strategies to maintaining biodiversity while ensuring long-term productivity are imperative as pressures from external factors, such as human population growth and climate change, strain these agroecosystems.

Disturbance from livestock grazing and fire are indispensable elements to maintain tropical and subtropical grasslands. Not only are these individual disturbances important for maintaining grassland ecosystems but their interaction, termed pyric-herbivory, is also important (Fuhlendorf et al. 2009). The interaction between fire and livestock grazing results in the spatial heterogeneity of vegetation structure whereby the vegetation in recently burned areas is kept short by grazing herbivores while in unburned areas grow taller due to reduced grazing pressure (Fuhlendorf and Engle 2001). Cattle are particularly known to be attracted to the re-growing vegetation in recently burned patches which generally lacks dead plant matter and contains emergent forage with greater protein content compared to mature forage (Allred et al. 2011). This heterogeneity in vegetation structure has shown benefits for wildlife while not impacting cattle performance (Allred et al. 2014; Hovick et al. 2014; Winter et al. 2014; Ricketts and Sandercock 2015).

Grazing intensity and distribution have long concerned the cattle production community. With the advancements in Global Positioning System (GPS) receivers and battery technology, we can track cattle at fine spatial and temporal scales and based on their movement patterns, infer behavior (Clark et al. 2006; Augustine and Derner 2013). Periods of cattle grazing can be distinguished from other behaviors (i.e. resting, traveling) and can be identified by examining the velocity of sequential GPS locations through time. Having known grazing locations, we can identify spatial and temporal grazing patterns and extrapolate their relation to recently burned areas within pastures.

The use of prescribed fire in humid, subtropical grazinglands should have similar effects to those seen in other grazed grassland systems, whereby cattle graze in recently burned areas throughout the growing season. We examined two pasture management techniques to evaluate the spatial and temporal distribution of cattle grazing in southern Florida grazinglands. The first technique, often referred to as patch burning, is a method in which a small portion of the pasture is burned to create a heterogeneous cattle and vegetation structural distribution at the pasture scale (Fuhlendorf and Engle 2001). In the second method, we conducted a prescribed burn of the entire pasture in the initial study year to create a more homogenous cattle and vegetation distribution at the pasture scale. The second method is similar to traditional pasture management techniques employed in southern Florida grazinglands.

Our first objective was to examine the grazing intensity of cattle in pastures treated with patch burn grazing compared to pastures treated with an entire pasture burn that was on par with traditional management in southern Florida. Since fire removes dead vegetation and promotes the regrowth of forage with greater protein content (Allred et al. 2011), we would expect cattle to graze recently burned areas with more intensity than unburned areas shortly after the application of fire. Further, because cattle maintain this short, growing forage, cattle should maintain a greater intensity of grazing in the recently burned areas compared to unburned areas. However, southern Florida's humid, subtropical grasslands are highly productive, particularly in years lacking a winter freeze. As a result, we may not observe intense and sustained grazing in the recently burned area that is seen in other grazinglands treated with the application of fire and grazing, such as in the Great Plains.

Our second objective was to evaluate the evenness of cattle distribution in relation to patch burn treatments compared to fully burned pastures. Cattle are naturally selective grazers and select particular areas based on many factors and at different scales (e.g. forage palatability and quality, topography, distance to water; Bailey et al. 1996). This selectivity leads cattle to graze particular areas and avoid others, resulting in a clustered spatial pattern. Since the use of fire removes dead vegetation and can top kill plant species that may be expansive or unpalatable on recently burned areas, we would expect cattle to graze with less spatial clustering compared to unburned areas.

Lastly, we examined the temporal distribution of cattle grazing in humid, subtropical grazinglands. Unlike higher latitudes with continental weather patterns that can experience wide ranges in temperature, humid, subtropical grasslands are generally characterized by mild, dry winters and warm, wet summers. It's widely accepted that cattle graze less during extreme warm periods (Ehrenreich and Bjugstad 1966). However, we have seen little data characterizing the year-long temporal grazing distribution of cattle in humid, subtropical grazinglands.

Study Design

We established 16 study pastures (Fig 1.) within Buck Island Ranch (BIR). Pastures were established based on criteria including forage type, avoidance of wetlands, elevation, soil types, and existing fence lines. Pastures ranged in size from 38.5 to 45 ac with a mean of 41 ac. A randomized block design (paired pastures based on location) was established and pastures were divided evenly into two treatments: a full pasture prescribed burn the initial year of the study (FB) and a patch prescribed burn where a different one-third pasture patch was burned each year of the study (PB). Pastures were also divided evenly between improved (IMP) (n=8) and semi-native pasture (SNP) (n=8). Prescribed fires were conducted between 30 January 2017 and 8 February 2017. IMPs were stocked with 32 cows and SNPs were stocked with 15 cows. Cattle were introduced into PB pastures beginning in early February. Cattle herds were rotated between paired PB and FB pastures every 4-8 weeks and total annual animal use days of each pasture within a pasture-type was kept as similar as possible. We refer to the time span where cattle are in a particular treatment as grazing periods. Cattle were stocked in IMPs year-round while SNPs contained cattle between February and late July. Cattle had unrestricted access to a single water trough in each pasture and were provided protein supplement.

To estimate cattle activity, we utilized GPS collars deployed for a period of at least six months after which new collars were attached. GPS collars consisted of GPS unit and battery, enclosed PVC tube housing, nylon collar, and a counter-weight to orient the PVC tube on top of the cow's neck (Fig 2). The GPS unit was set to record a fix location every 5 minutes (Perthold Engineering LLC). GPS units were powered by a 3.6 V, 14.5 Ah, lithium thionyl chloride battery which, in combination with logging interval, allowed active deployment of around 8 months. Collars were attached randomly to a minimum of 32 cows which were randomly associated to herd in each pasture (4 per pasture).

Grazing Behavior

Once downloaded from the GPS units, data were managed and manipulated using PostgreSQL and PostGIS. We removed all GPS locations outside of pasture boundaries. We also removed GPS locations coinciding with the day of pasture introduction and pasture removal. Cattle activity categories were established based on distance between successive GPS locations. Resting activity was classified as distance less than 10 m between successive GPS locations. Grazing activity was classified as distance from 10 to 100 m between successive GPS locations. Traveling activity was classified as distance greater than 100 m between successive GPS locations. GPS locations that occurred around watering troughs and protein supplementation were retained in the data set but were typically classified as resting activity.

Cattle grazing intensity

Grazing accounted for 58.3% of all activity (Fig 3). Resting and travelling activity accounted for 38.1% and 3.5% respectively. For 2017, 1,061,497 points were classified as grazing from the 1,819,885 total points.

Examining just grazing behavior, the grazing intensity of patches within PB pastures, we observed a significant influence of patch, time and the interaction of patch and time for all five grazing periods on grazing proportion ($p<0.001$). In PB pastures, coefficients were consistently positive in burned patches compared to unburned patches, thus indicating that cattle spent more time in burned patches. Grazing intensity in FB pastures was similar across all areas. (Fig 4a and 4b)

Cattle grazing evenness

In PB pastures we observed a significantly smaller index of dispersion (more even grazing) in the recently burned patch compared to unburned patches in grazing periods 1, 2, and 3 ($p < 0.05$; Figure 5a). Also, in PB pastures we saw a significant influence of week in grazing periods 1 and 3, by grazing period 4 and 5 no affect was noticeable. In FB pastures, there was no consistent effect of more even grazing. However, we did observe a significant difference in the index of dispersion between sectors in grazing period 3 (Figure 3b).

Cattle grazing and time of day

Results from model selection suggests that season (dry-cool=winter and early spring, wet-warm=summer, wet-cool=fall), temperature, and treatment (PB, FB) all contribute explanatory power to the hourly mean grazing points of cattle (Fig 6a and 6b). Interpretation of the results is difficult due to interaction terms. Some take home messages are; grazing during wet-warm summer is reduced considerably during the daytime; cattle are preferring to graze early morning and late evening; cattle may also graze less per 24hrs in the summer, but the question remains is this because they can access better quaility grass more quickly or that the heat reduces grazing capability.

Conclusions

Cattle spend about 60% of their time grazing in a 24hr period. Fire changes grazing behavior and we conclude that fire conducted in a patch-burn attracts cattle to that burnt area thereby increasing the intensity of grazing and reduces grazing intensity on unburnt portions of the pasture. This affect persists for at least a year. Burning promotes more even grazing across the burnt area, and is less clumped than in unburnt patches, which allows cattle to potentially shape the grazing pattern with repeated visits overtime. After each rest of a burnt pasture during rotations, cattle are immediately attracted to the burnt treatment area, and the length of attraction and use slowly declines over length of grazing rotation period. The hot summers of the Florida sub-tropics impacts daily grazing behavior and may decrease over all forage intake during this extreme season.

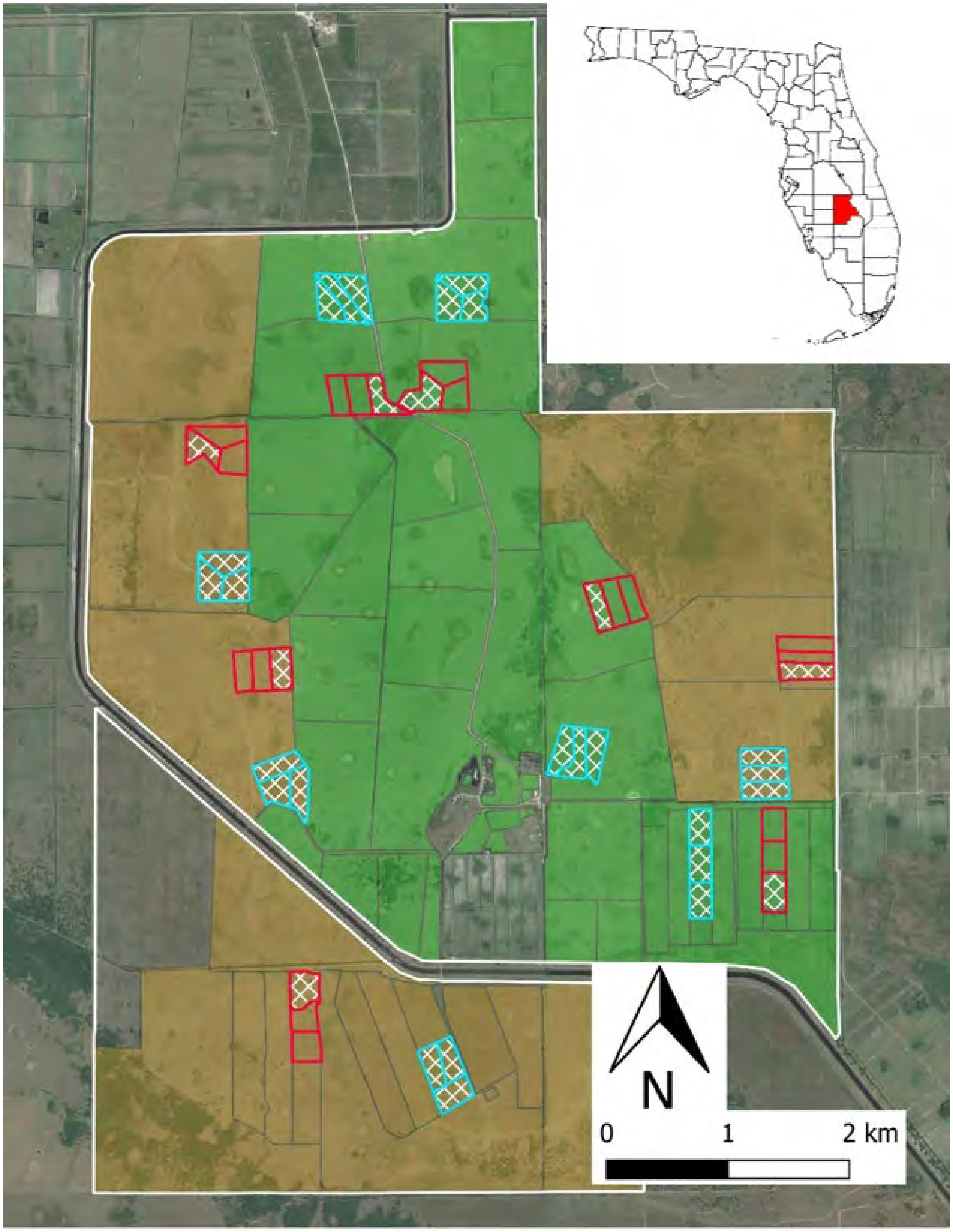


Figure 1: Replicated Patch Burn Grazing (red) and Full Burn Grazing (blue) treatments at Buck-Island Ranch, Highlands County Florida.

Figure 2: Boughton lab made GPS units, and attachment to cattle.

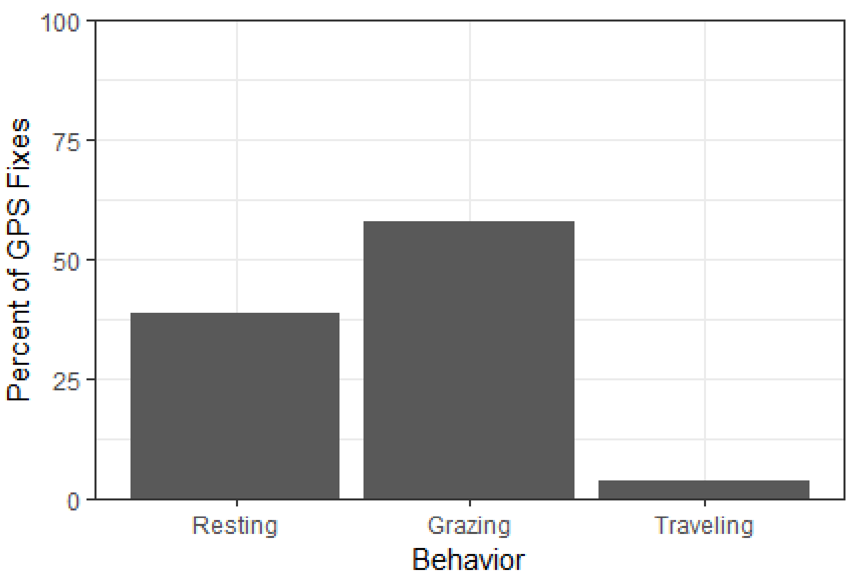


Figure 3: Distribution of GPS fixes categorized by behavior.

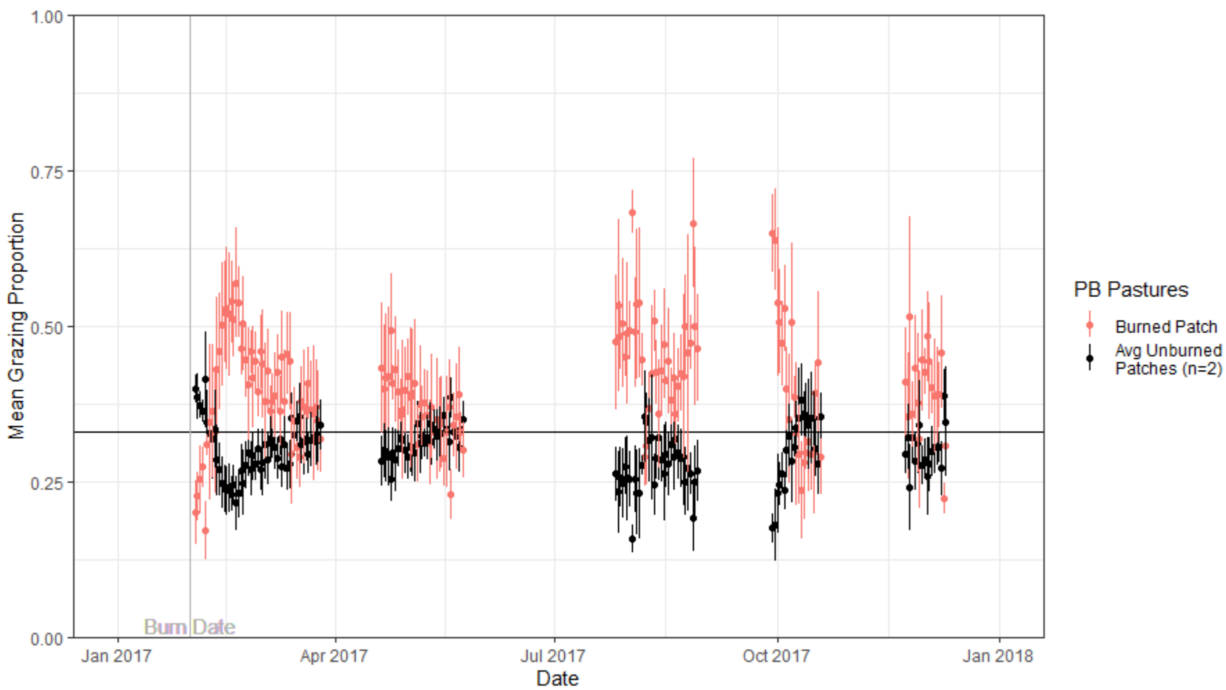


Figure 4a: Cattle grazing intensity in patch burn treated pastures, over five grazing rotations. Notice affect of increased use of burnt patch (red) for all grazing periods. Within grazing period intensity of burnt patch use typically declines with length of rotation.

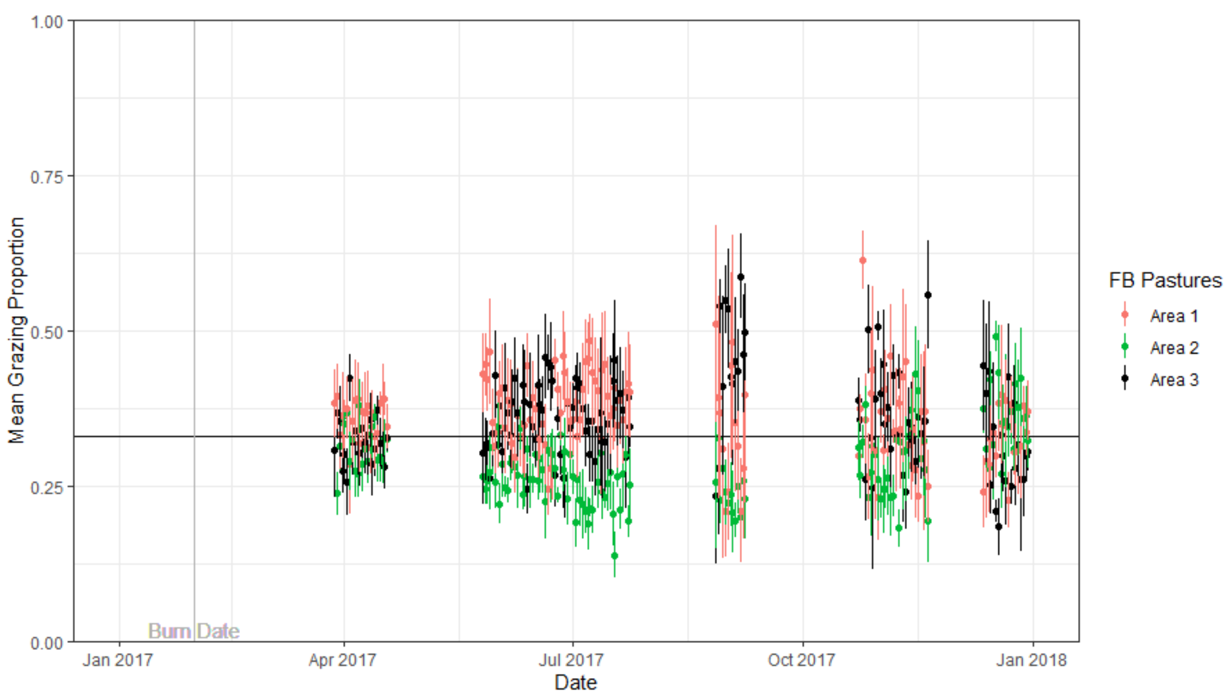


Figure 4b: Cattle grazing intensity in full burn treated pastures showed no specific choice of patch area as expected.

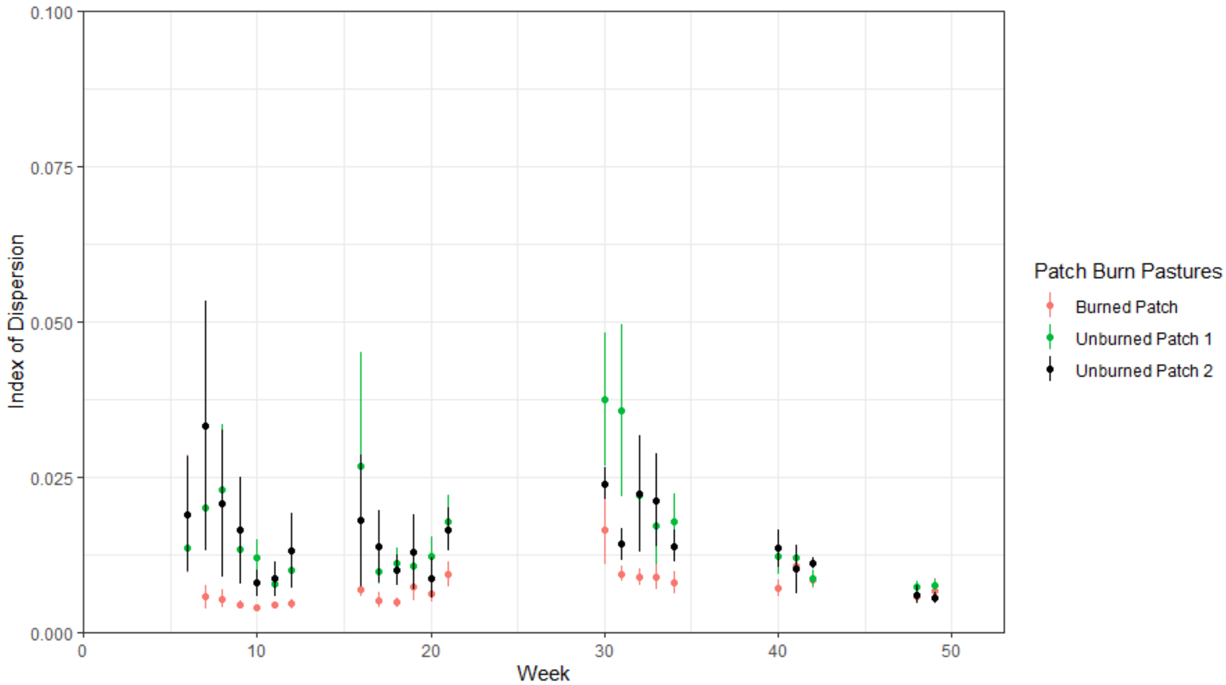


Figure 5a: Index of dispersion per week for cattle grazing in patch burn treated pastures.

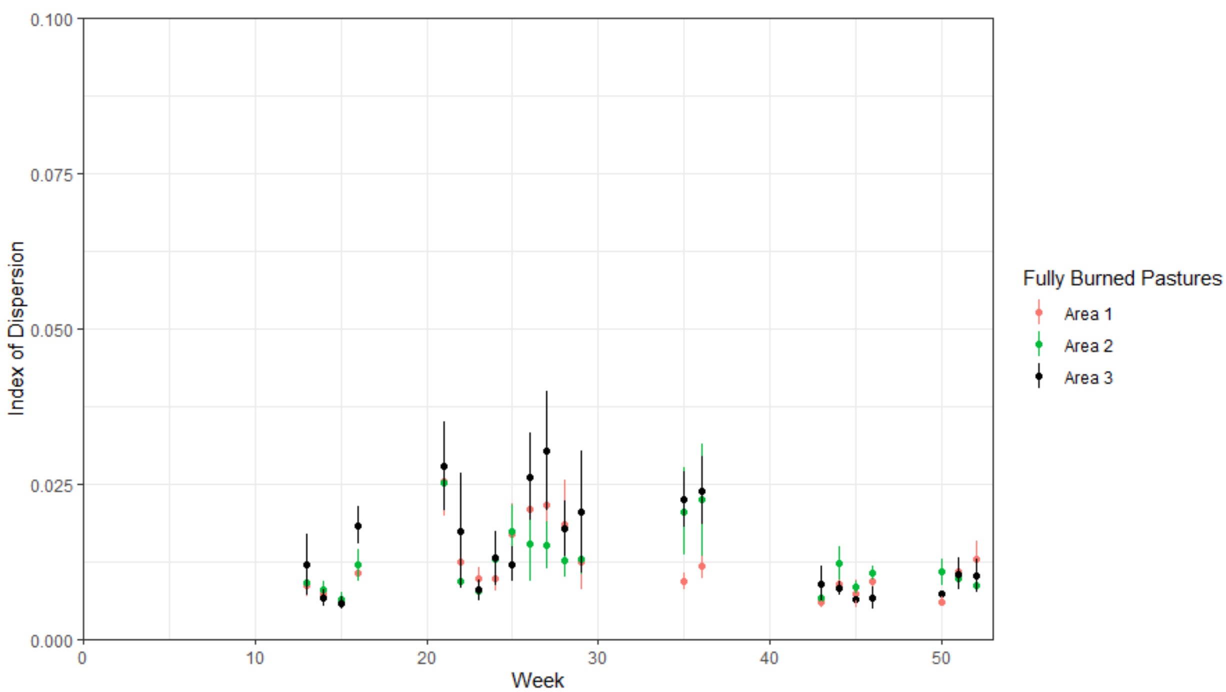


Figure 5b: Index of dispersion per week for cattle grazing in full burn treated pastures.

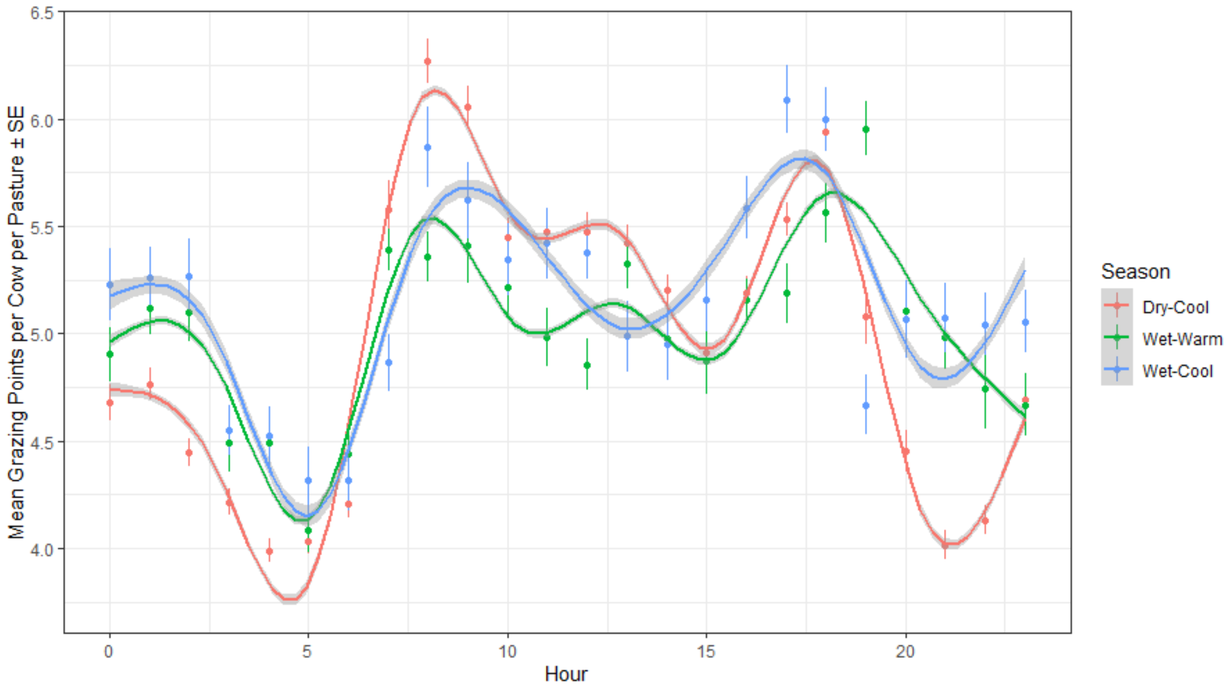


Figure 6a: Observed (points) and modeled (lines) circadian cattle grazing patterns by season in patch burn (PB) treated pastures.

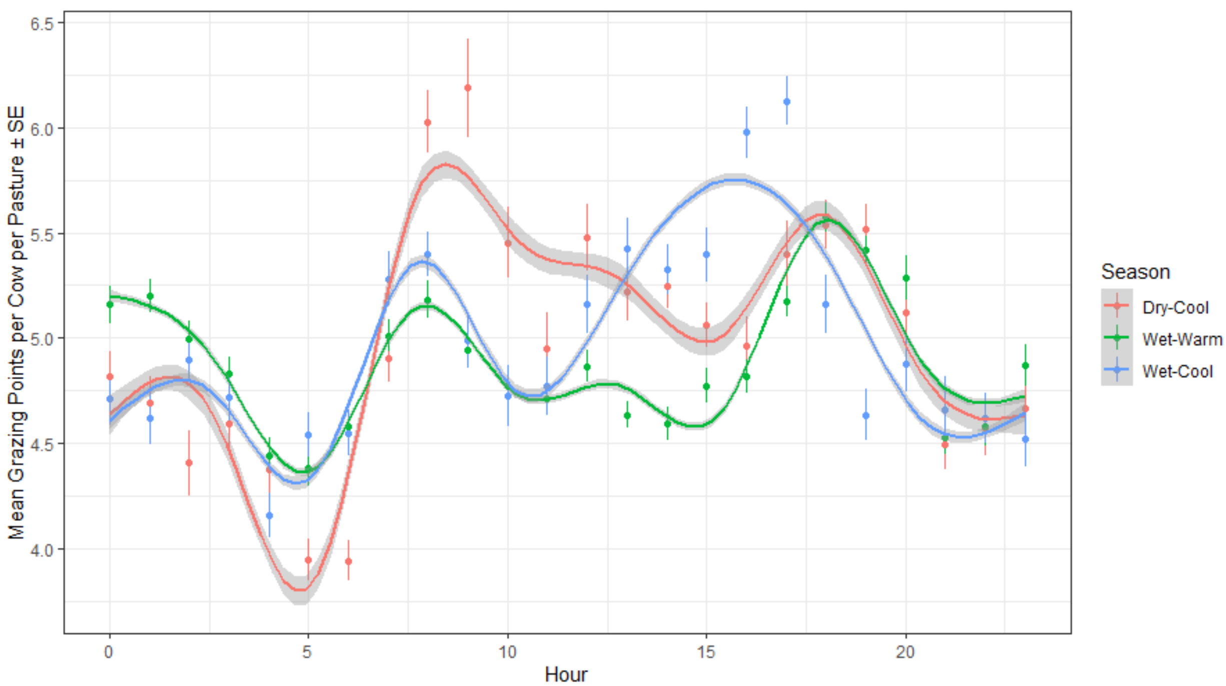


Figure 6b: Observed (points) and modeled (lines) circadian cattle grazing patterns by season in full burn (FB) treated pastures.

Integrating Stocker Cattle Grazing Warm-Season Annual Forages into Cash Crop Rotations

Chris Prevatt, State Specialized Agent II, Range Cattle REC, Ona

The current economic environment of low commodity prices offers few opportunities for agricultural producers. Row-crop farmers across the Southeast have begun searching for new ways to further diversify their cash crop rotations and generate new income streams for their business. One alternative that producers have shown interest in is the evaluation of integrating livestock into cash crop rotations.

During 2018, a project began to evaluate the economics of grazing stocker cattle on warm-season annual forages in the Southeast. To gain a better understanding of the economics of integrating cattle on cropland during the warm-season, a simulated economic grazing experiment was developed to evaluate grazing warm-season annual forages as a cash crop alternative over the past fifteen years. Research data were collected from the University of Florida, Auburn University, and the University of Georgia to evaluate the potential forage yield, animal production, revenue, cost of production, and net returns of stocker cattle grazing warm-season annual forages. In addition, USDA AMS (Agricultural Marketing Service) data were collected from the past fifteen years to calculate the value of animal gain during the warm-season grazing period. The value of gain combined with animal production data from university grazing experiments estimates the annual revenue that could have been generated in previous years. An excel spreadsheet was developed to use the data collected to simulate the annual production and economic outcomes for the past fifteen years. The production variables being evaluated can be seen in Table 1. Please note, that the production information included in Table 1 is based on the research data included in this analysis and production expectations from our project advisors.

Table 1. Estimated Production Summary for Grazing Warm-Season Annual Forages with Stocker Steers in the Southeastern USA.	
Forage and Animal Information	**Warm-Season Annual Forage Mix***
Seeding Rate, lbs./acre	25
Projected Planting Date	20-Apr
Level of Nitrogen (N) Applied, Split Applications	120
Number of Acres Planted	132
Number of Stocker Steers (At Beginning of Grazing Period)**	210
Number of Stocker Steers (At End of Grazing Period)	208
Death Loss, %	1.0%
Stocking Rate, head/acre	1.6
Begin Grazing Date	5-Jun
End Grazing Date	15-Oct
Number of Grazing Days	132
Forage Production, DM lbs./acre	8,000
Level of Forage Utilization, %	40%
Forage Consumption, DM lbs./acre	3,200
Forage Quality, Total Digestible Nutrients (TDN)	65%
Forage Quality, Crude Protein (CP)	15%
Animal Gain, total pounds gained	42,300
Animal Gain, pounds/acre	320
Animal Gain, pounds/animal	203
Animal Gain, ADG (average daily gain), lbs./head/day	1.54

Warm-Season Annual Forage Mix consists of BMR Sorghum-Sudangrass, Pearl Millet, Sorghum-Sudangrass DM, BMR Dwarf Sorghum-Sudangrass, BMR Forage Sorghum, Grain Sorghum, BMR Grazing Corn, Browntop Millet, Sunflower, Safflower, Buckwheat, Okra, Sunn Hemp, Mung Beans, Guar, Cowpeas, and Forage Soybeans.

***Stocker Steers had an average weight of 600 lbs./head at turn-in.*

This cash crop alternative is planted on cropland following a cool-season annual forage cover crop. It will receive 120 pounds of nitrogen (N) fertilizer in two applications (60 – 60) over 132 grazing days. The stocker steers will begin grazing warm-season annual forages at 600 pounds on June 5th and finish grazing on October 15th. Total production costs include the amortization of fencing and water systems, seed, hired labor, fertilizer, lime, custom applications, machinery and equipment, interest, general overhead, and land rent.

An economic summary (Table 2) for grazing stocker cattle on warm-season annual forages is available below. The results are broken down into three sections: value of gain (revenue), forage cost of gain (cost of production), and net value of gain above forage costs (net returns above specified costs). Please note, that the economic summary information included in Table 2 is based on research data included in this analysis and production expectations from our project advisors.

Table 2. Estimated Economic Summary for Grazing Warm-Season Annual Forages with Stocker Steers in the Southeastern USA.

Value of Gain, Forage Cost of Gain, and Net Value of Gain Above Forage Costs	***Warm-Season Annual Forage Mix***
Value of Gain, $	*$46,530.00*
Value of Gain, $/grazing day	*$352.50*
Value of Gain, $/head	*$223.70*
Value of Gain, $/acre	*$352.50*
Value of Gain, $/lb.	*$1.10*
Forage Cost of Gain, $	*$20,100.00*
Forage Cost of Gain, $/grazing day	*$152.27*
Forage Cost of Gain, $/head	*$96.63*
Forage Cost of Gain, $/acre	*$152.27*
Forage Cost of Gain, $/lb.	*$0.48*
Net Value of Gain Above Forage Costs, $	*$26,430.00*
Net Value of Gain Above Forage Costs, $/grazing day	*$200.23*
Net Value of Gain Above Forage Costs, $/head	*$127.07*
Net Value of Gain Above Forage Costs, $/acre	*$200.23*
Net Value of Gain Above Forage Costs, $/lb.	*$0.62*

**For this anaylsis, Value of Gain (VOG) was estimated to be $1.10/lb.*

As this project moves forward, hopefully we can shed more light on two important questions. Will grazing warm-season annual forages be an economically viable cash crop option? If not, will the benefits to yield or the reduction in production costs for future cash crops make it an economically viable option for cash crop rotations?

The full results from the first year of this project will be available at the 2019 Range Cattle Research and Education Center Field Day on October 24, 2019 at the Beef Cattle and Forage Economics Booth. For additional information please contact Chris Prevatt at prevacg@ufl.edu.

Exploring Long-Term Trends in Beef Cattle Markets

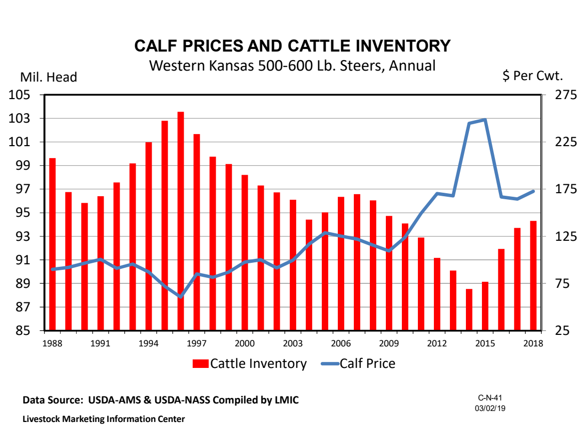
Chris Prevatt
Beef Cattle and Forage Economist
UF/IFAS Range Cattle REC

1

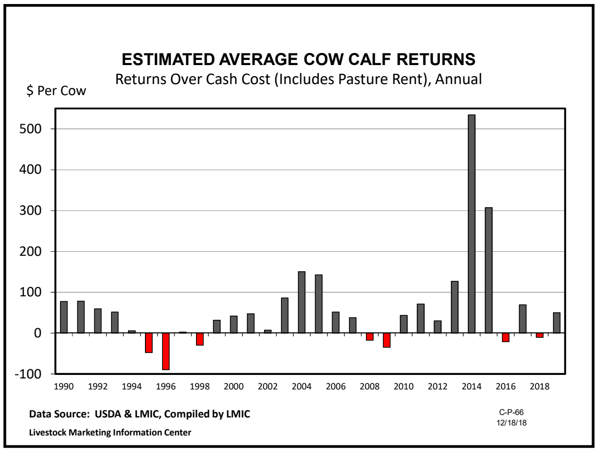
Agricultural Returns are Cyclical in Nature

- Years of good returns are generally followed by years of poor returns.
- Profitability in the Ag Sector from 2006 to 2012 was greater than the 40 previous years combined.
- Very few businesses fail from paying income taxes.

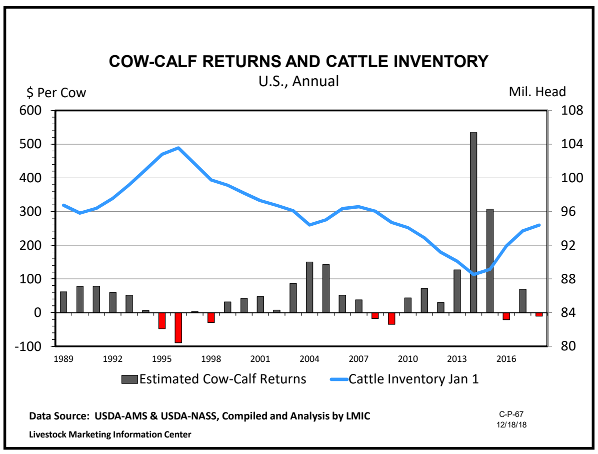
2



3



4



5

Projected Cattle Prices and Cow-Calf Profits During the Four Phases of the Cattle Price Cycle

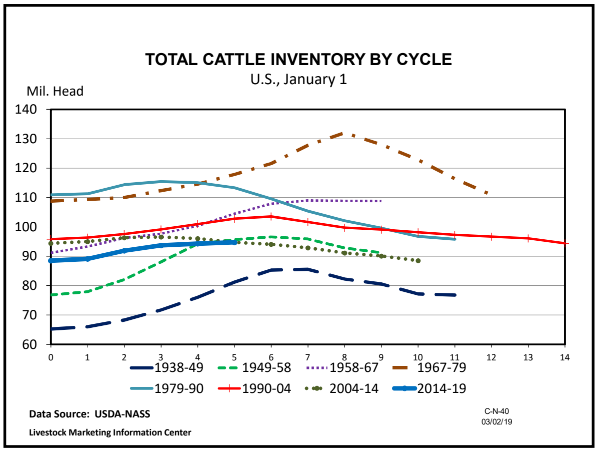
Phase of the Cattle Price Cycle	Projected Cow-Calf Profits/Losses

****Projected Cattle Prices and Cow-Calf Profit Trends are based on previous Cattle Cycles.***

***Cattle Price Cycle occurs from U.S. Cattle Herd Expansion.*

****Increases in Beef Production cause a transition to cyclically lower cattle prices. Herd expansion continues until prices approach most producers cost of production.*

6

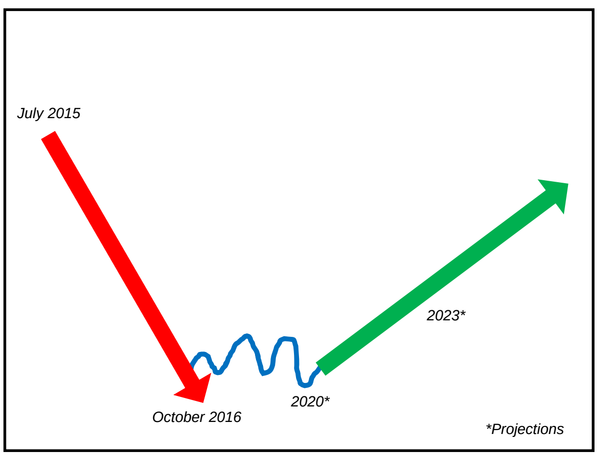


7

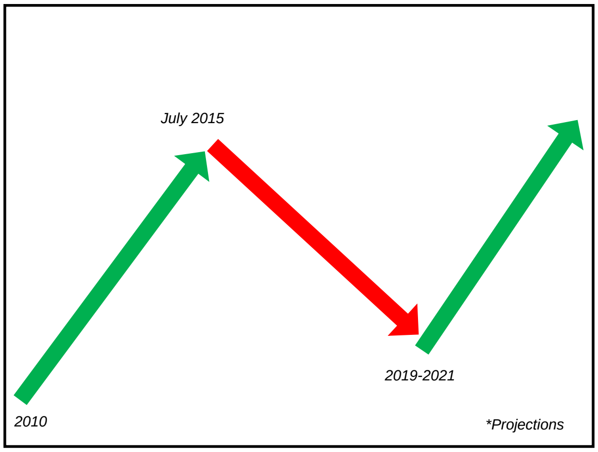
Projected Cattle Prices and Cow-Calf Profits During the Four Phases of the Cattle Price Cycle

Phase of the Cattle Price Cycle	Projected Cow-Calf Profits/Losses
Top of the Price Cycle (2013 – 2015)	***Significant Profits***
Downward Price Transition (2015 – 2019?)	***Profits/Losses*** *Declining Profitability*
Bottom of the Price Cycle (2019 – 2021?)	***Significant Losses***
Upward Price Transition (2021 – 2027?)	***Profits/Losses*** *Improving Profitability*

8



9



10

Projected Cattle Prices and Cow-Calf Profits During the Four Phases of the Cattle Price Cycle

Phase of the Cattle Price Cycle	Projected Cow-Calf Profits/Losses
What is our strategy for the bottom of the Cattle Price Cycle? 1) Survive. 2) Analyze Investment Potential of Herd Expansion.	
Bottom of the Price Cycle (2019 – 2021?)	***Significant Losses***
Upward Price Transition (2021 – 2027?)	***Profits/Losses*** *Improving Profitability*

11

Projected Cattle Prices and Cow-Calf Profits During the Four Phases of the Cattle Price Cycle

If I am a producer with a High Level of Management, instead of making a small profit or breaking-even during the Bottom of the Price Cycle, expansion would cause your operation to incur a loss… for the opportunity of future profits in the years ahead.

<u>Value Investing</u>

Bottom of the Price Cycle (2019 – 2021?)	***Significant Losses***

THIS STRATEGY REQUIRES CASH FLOW. *RISK*

12

Analyze Investment Potential of Herd Expansion

Business is about making Money, NOT CATTLE.

If cattle are not making money, then our strategy must change.

13

Analyze Investment Potential of Herd Expansion

- The value of a beef cow to any rancher is the sum of net income generated from all the calves she produces, plus her cull cow income.
- **Do you want the majority of your females calving during the price-increasing or price-decreasing years of the beef price cycle?**

14

U.S. Cattle Price Cycle

- If you do the right thing at the wrong time, things don't always work out so well.
- You have to do the right time at the right time to have financial success in this business.

15

Most Valuable Female Owned During the Last Beef Price Cycle

- A Heifer Calf Born in 2006.
- Developed in 2007.
- Had her first calf in 2008.
- Had Six More Calves, 2009-2014.
- Then was culled in 2014.

**Cull Cow Income is a big contributor to the lifetime value of a beef cow.*

16

Second Most Valuable Female Owned During the Last Beef Price Cycle

- A Heifer Calf Born in 2007.
- Developed in 2008.
- Had her first calf in 2009.
- Had Six More Calves, 2010-2015.
- Then was culled in 2015.

17

Least Valuable Female Owned During the Beef Price Cycle*

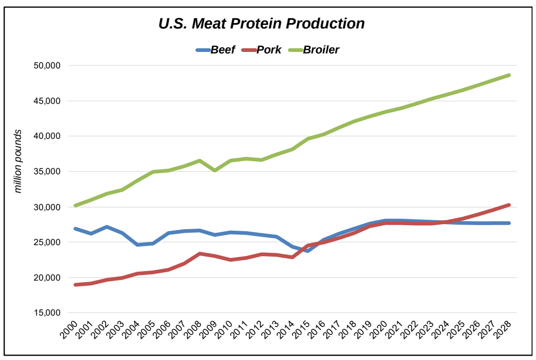
- A Heifer Calf Born in 2014.
- Developed in 2015.
- Had her first calf in 2016.
- Had Six More Calves, 2017-2022.
- Then was culled in 2022.

18

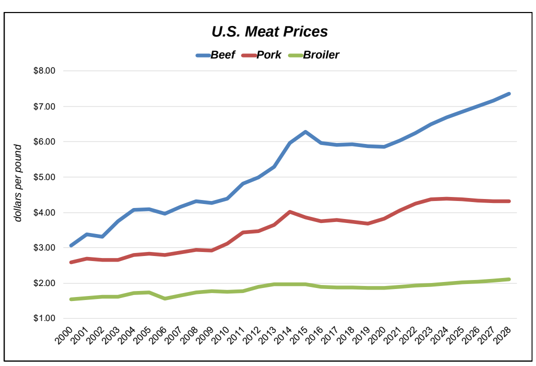
*Second Least Valuable Female Owned During the Beef Price Cycle**

- A Heifer Calf Born in 2015.
- Developed in 2016.
- Had her first calf in 2017.
- Had Six More Calves, 2018-2023.
- Then was culled in 2023.

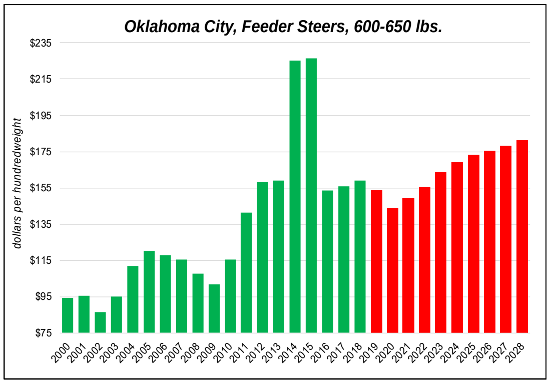
19



20



21



22

Thank you for your attention.
I hope you have a profitable 2019!

23

‘Mislevy’ Bermudagrass

Joao Vendramini, Professor, Range Cattle REC, Ona
Jose Dubeux Jr., Associate Professor, North Florida REC, Marianna, and
Esteban Rios, Assistant Professor, Agronomy Dept., Gainesville

Introduction

Bermudagrass is the most planted forage species in the southeastern USA, covering approximately 30 million acres This species was introduced into Savannah, GA in 1751 by the former governor of Georgia, Henry Ellis. Currently, bermudagrass is used for grazing, haying or silage, but there are also varieties being used for ornamental purposes. Bermudagrass has been preferred over other warm-season perennial grass species due to greater nutritive value and persistence under adverse climatic conditions and management practices.

There is a high genetic variability in bermudagrasses, which allows for variation in adaptation and morphological characteristics. Although this plant is considered a warm-season perennial grass, it can grow in latitudes up to 53^{o} and in elevations ranging from sea level to 9000 ft.

Several genotypes have been released in the USA, with most of them being F_1 hybrids between different species of *Cynodon* genus. ‘Coastal,’ one of the most widely used cultivars, was released in 1943, after more than 5 years of research. Some of the current bermudagrass cultivars and genotypes used for grazing, hay, or silage production includes ‘Coastal,’ ‘Tifton 85,’ ‘Alicia,’ Jiggs, ‘Russell,’ and ‘Tifton 44,’ among others.

In the southeastern USA, warm-season perennial grass production is limited in early spring and late autumn and there is a need to develop cultivars less sensitive to shorter daylength and/or decreased temperatures to have greater forage production in those periods of limited forage production. Early spring forage production is highly desirable because producers may increase their profitability by decreasing the need for supplementation. In addition, hay producers could harvest and market hay earlier than any other producers in the country. Therefore, there has been a need to develop and release a bermudagrass cultivar with early spring production that would meet the needs of forage producers in the southeastern USA.

‘Mislevy’ is a natural bermudagrass hybrid entry that was found at the UF/IFAS Range Cattle Research and Education Center in 2000. Dr. Paul Mislevy noticed an off-type bermudagrass plant present in a Tifton 85 bermudagrass field. The plant was collected, multiplied in a greenhouse, and later transferred to the field where a pure stand of Mislevy was established in 2001. Research projects conducted in Florida indicated that the variety has greater early spring forage production than most bermudagrass cultivars with similar nutritive value and persistence, indicating that it has merit to be released as a bermudagrass cultivar with greater early-spring forage production.

Clipping Studies

Ona Trial

An experiment was conducted at the UF/IFAS Range Cattle Research and Education Center in Ona, FL in 2015 and 2016.

Treatments included 5 bermudagrass cultivars/genotypes (hereafter called “cultivar”): Coastal, Tifton 44, Tifton 85, Jiggs, and Mislevy distributed in a randomized complete block design with 4 replicates.

Plots were established in August 2014 and fertilized with 300 lb/acre of 10-10-10. Plots were 9 x 6 ft with 3 ft between plots. Plots were staged on April 4, 2015 and harvested manually with clippers to 6-inch stubble height every 5 weeks thereafter. Plots were fertilized with 300 lb/acre of 20-05-20 after every harvest. In 2015, plots were harvested on May 5, June 16, July 20, August 24, and September 28. In 2016, harvest dates were March 29, April 26, May 24, June 21, July 19, August 16, September 13, October 11, and November 3.

Mislevy and Jiggs had greater herbage accumulation than Tifton 44, Tifton 85 and Coastal in March (Table 1). Tifton 85 had greater herbage accumulation than other cultivars in May and June. Mislevy had greater herbage accumulation than the other cultivars in August but similar to Jiggs and greater herbage accumulation than Tifton 85, Tifton 44, and Coastal in September and October. The cumulative annual herbage accumulation of Mislevy was similar to Jiggs and greater than Tifton 85, Tifton 44, and Coastal.

There was a cultivar x month interaction for CP and IVDOM concentrations (Table 1). Crude protein concentration of Mislevy did not differ from Jiggs in March but was less than Tifton 85, Coastal, and Tifton 44 in March and April. However, Mislevy was among the cultivars with the greatest CP concentration during other months of the experimental period.

There were no differences in IVDOM among cultivars in March, but Tifton 85 was among the cultivars with the greatest IVDOM concentrations during the experimental period. Mislevy did not differ from Tifton 85 in May and August but had greater IVDOM concentration than Tifton 85 in June. Mislevy had similar IVDOM to Jiggs and Tifton 44 during the majority of the experimental period and greater than Coastal in June, July, and August.

No viable seed from any of the cultivars were observed in this trial. At the termination of the study, the experimental plots were sprayed with 4 qt/acre of glyphosate and all cultivars had 100% control with no remaining vegetation after 1 month.

Marianna Trial

An experiment was conducted at the UF/IFAS North Florida Research and Education Center in Marianna, FL in 2015 and 2016.

Treatments included 7 bermudagrass cultivars: Alicia, Russell, Coastal, Tifton 44, Tifton 85, Jiggs, and Mislevy distributed in a randomized complete block design with 4 replicates.

Plots were established in July 2014 and fertilized with 300 lb/acre of 10-10-10. Plots were 9 x 6 ft with 3 ft between plots. Plots were staged on April 4, 2015 and harvested manually with clippers to a 6-inch stubble height. Plots were harvested and fertilized with 300 lb/acre of 20-05-20 every 5 weeks thereafter. In 2015, plots were harvested on May 11, June 15, July 22, August 24, and September 28, and November 3. In 2016, harvest dates were, April 4, May 8, June 13, July 20, August 19, September 27.

There was no difference in herbage accumulation among cultivars in April and November; however, Mislevy and Jiggs had greater herbage accumulation than the other cultivars in May (Table 2). Tifton 85 had greater herbage accumulation than Mislevy in June, July, and August, and was similar to Mislevy in September. Mislevy, Tifton 44, Tifton 85, and Jiggs had greater herbage accumulation than the other bermudagrass cultivars in September. Mislevy, Jiggs, Tifton 85, and Coastal had the greatest and Tifton 44, Alicia, and Russell had the least herbage accumulation.

There was no difference in CP concentrations among cultivars; however, there was a cultivar x month interaction in IVDOM concentrations (Table 2). Coastal had the least IVDOM concentration in April and there was no difference among the other cultivars. Tifton was among the cultivars with the greatest IVDOM concentration in all months except November. Mislevy had lower IVDOM concentration than Tifton 85 in June and September but did not differ in other months. Mislevy had greater IVDOM concentration than Jiggs in May and November.

Grazing Study

A grazing study was conducted at the UF/IFAS Range Cattle Research and Education Center, in Ona, FL from 2002 to 2004.

Four bermudagrass cultivars/entry, Mislevy, Jiggs, World Feeder, and Tifton 85, and 4 stargrass (*Cynodon nlemfuensins*), Stargrass 2000, Florona, Okeechobee, and Ona Pasture 2 were evaluated using four grazing frequencies, 2, 4, 5, and 7 weeks. These were distributed in a split-plot arrangement in a randomized complete block design with three replicates.

Main plots (forage species/cultivar) was 90 x 90 ft divided in 4 subplots of 10 x 10 ft each. Plots were fertilized with 178 lb N/acre/year during the experimental period.

The mob stocking method was used to graze the plots. Thirteen steers were used to graze the plots to a stubble height of approximately 4 inches. Prior to grazing, samples were collected from each experimental unit for herbage accumulation and nutritive value determination. Plots were not grazed from November to March but the herbage accumulation in the period was recorded. The procedures for nutritive value determination are similar to procedures described for the clipping trial at Ona.

Mislevy, Jiggs, and Florona had the greatest herbage accumulation among the bermudagrass and stargrass cultivars tested (Table 3). There was a year x cultivar interaction and the interaction occurred because few cultivars decreased herbage accumulation from 2002 to 2003, likely due to poor persistence. Mislevy and Jiggs had the greatest herbage accumulation during the cool season (November to March). In addition, there was a grazing frequency x cultivar interaction. Mislevy had the greatest herbage accumulation when harvested at 7 weeks regrowth interval. Bermudagrass cultivars are susceptible to diseases and pests at longer regrowth intervals and it was hypothesized that Mislevy had the least tissue damage due to diseases and insects.

Tifton 85 had the greatest IVDOM concentrations among the cultivars and Mislevy and Jiggs had similar IVDOM and CP concentrations. However, the average nutritive value for Mislevy, Jiggs, and Florona was 16.3% CP and 59% IVDOM, which are above the nutritional requirements of most beef cattle categories.

Mislevy, Jiggs, Tifton 85 and Florona were the most persistent cultivars in the trial, averaging only 2% weeds in the herbage mass after 3 years of grazing.

Summary and Conclusions

Jiggs has been the most planted bermudagrass cultivar in South Florida, while Tifton 85 has been the most planted in North-Central Florida. Jiggs is more adapted to the poorly drained soils found in South Florida, where Tifton 85 has shown decreased persistence under those conditions. However, Tifton 85 has consistently presented greater IVDOM due lower concentrations of ether-linked ferulic acid in the cell wall than other bermudagrass cultivars.

It has been reported that Jiggs has greater spring and fall herbage accumulation than Tifton 85, but similar during the summer. Early herbage accumulation is of great interest to producers because early spring and fall are periods of limited forage.

Mislevy showed similar early spring and fall production to Jiggs with similar nutritive value. In Marianna, Mislevy had slightly greater IVDOM concentrations than Jiggs in the spring. The superior herbage accumulation of Mislevy and Jiggs in the cool season was confirmed in the grazing study. Mislevy and Jiggs had the greatest annual herbage accumulation among the bermudagrass and stargrass cultivars tested in the grazing study. In addition, Mislevy had greater herbage accumulation at longer regrowth intervals. Due to the unpredictability of Florida weather, this may be an important characteristic to give flexibility to producers to delay forage harvest.

Considering hay production, Mislevy will be attractive to producers because it has thinner stems than Tifton 85 and will dry faster in the field. In addition, hay with thin stems have better appearance for marketing due to the perception that thinner stems result in better nutritive value. Mislevy has potential to become an important forage for grazing and hay production in Florida.

Mislevy is propagated by mature tops and sprigs. One-acre plots were planted in Gainesville and Marianna in 2019 to supply plant material to producers in a near future. The Range Cattle Research and Education Center has approximately 5 acres of Mislevy and will be able to supply plant material to producers in summer 2020.

Table 1. Cultivar/Entry x month interaction effects on herbage accumulation, crude protein (CP), and in vitro digestible organic matter (IVDOM) concentrations of bermudagrass harvested every 4 weeks in 2015 and 2016 at Ona, FL.

Cultivar/Entry	Month								Total	SE
	March	April	May	June	July	August	September	October		
	Herbage accumulation (kg DM/ha)									
Mislevy	1,070a†	2680ab	1400b	1500b	1800a	1800a	1900a	1000ab	13200a	250
Tifton 44	800b	2600ab	1300b	1500b	1300b	1500b	1700ab	900b	11700b	
Tifton 85	620b	2860a	1800a	2000a	1500b	1400b	1600b	360c	12300b	
Jiggs	1070a	2900a	1400b	1500b	1400b	1600b	1800ab	1100a	12800a	
Coastal	715b	2300b	1400b	800c	800c	700c	600c	900b	8200c	
SE					170					
	CP (%)									
Mislevy	13.4b	14.8c	18.9a	19.9a	12.7a	11.9a	11.4b	10.6a		1.30
Tifton 44	16.9a	16.8b	19.6a	20.3a	13.9a	13.2a	12.4b	11.3a		
Tifton 85	15.8a	19.6a	20.2a	17.0b	11.0b	10.8a	11.8b	9.7b		
Jiggs	13.6b	14.7c	19.5a	19.5a	12.9a	12.0a	11.8b	10.8a		
Coastal	15.3a	16.4b	17.3b	17.5b	12.5a	12.8a	13.6a	10.2a		
SE					0.48					
	IVDOM (%)									
Mislevy	44.3a	52.4b	55.9a	60.0a	48.9b	46.2a	43.8b	45.6b		0.69
Tifton 44	47.7a	53.4b	55.8a	55.2b	45.4bc	48.9a	45.4ab	47.7b		
Tifton 85	45.8a	58.9a	55.0a	56.4b	53.9a	50.7a	48.6a	50.0a		
Jiggs	44.2a	52.1b	54.8a	56.8b	46.0bc	45.8a	44.4ab	45.4b		
Coastal	44.2a	52.1b	56.4a	52.2c	44.4c	42.8b	44.5ab	47.5b		
SE					1.52					

†Means followed by the same letter are not different ($P \geq 0.05$)

Table 2. Cultivar/Entry x month interaction effects on herbage accumulation, crude protein (CP), and in vitro digestible organic matter (IVDOM) concentrations of bermudagrass harvested every 4 weeks in 2015 and 2016 at Marianna, FL.

Cultivar/Entry	Month							Total	SE
	April	May	June	July	August	September	November		
				Herbage accumulation (kg DM/ha)					
Mislevy	290a†	2400a	2200b	2000b	900b	650a	380a	8900a	240
Tifton 44	300a	1600b	1600c	1900b	1000ab	410ab	350a	7400b	
Tifton 85	190a	1500b	2500a	3400a	1150a	500ab	410a	9600a	
Jiggs	290a	2400a	2100b	2000b	1200a	570a	410a	9000a	
Coastal	150a	1600b	2800a	2200b	1200a	340b	490a	8900a	
Alicia	320a	1400b	2500a	2000b	850b	300b	350a	7800b	
Russell	300a	1500b	2500a	2000b	650c	330b	480a	7800b	
SE					110				
					CP (%)				
Mislevy	14.2	10.0	8.9	11.2	13.9	12.5	14.3		1.3
Tifton 44	14.1	11.0	8.8	12.9	13.8	12.9	12.7		
Tifton 85	14.7	12.8	8.9	11.8	14.5	12.3	13.4		
Jiggs	12.7	12.9	8.9	12.2	14.6	11.9	14.5		
Coastal	13.9	13.2	9.1	10.6	13.6	13.1	15.1		
Alicia	14.7	11.0	10.1	10.8	15.5	12.2	13.4		
Russell	14.8	12.8	8.7	10.8	14.5	13.3	12.8		
SE					0.7				
					IVDOM (%)				
Mislevy	65.6a	55.1a	45.2b	47.4b	51.6ab	43.7b	47.0b		1.4
Tifton 44	66.5a	53.2ab	48.9ab	45.0b	47.9b	44.3b	46.5b		
Tifton 85	66.0a	59.8a	51.1a	52.3a	54.7a	49.0a	47.3b		
Jiggs	66.9a	48.8b	46.5b	47.1b	52.0ab	45.0b	42.8c		
Coastal	61.8b	52.9ab	46.4b	46.7b	52.1ab	50.2a	53.3a		
Alicia	63.4ab	48.0b	38.4c	38.2c	47.0b	42.2b	45.7b		
Russell	63.3ab	45.3c	47.0b	42.6c	49.9b	46.9b	42.4c		
SE					1.0				

†Means followed by the same letter are not different ($P > 0.05$)

Table 3. Grass entry effects on total seasonal herbage accumulation during 2002 and 2003 [Adapted from Mislevy et al. (2008)].

	Year	
Bermudagrass	2002†	2003
	kg DM/ha	
Mislevy	15670a‡	13900a
Jiggs	15470a	12790ab
World Feeder	12330cd	10000c
Tifton 85	13000bc	11200bc
Stargrass		
2000	10760d	9800c
Florona	14570ab	12300ab
Okeechobee	12100cd	12100b
Ona Pasture No. 2	13220bc	12100b

† Harvest period from 6 June to 15 December 2002 and 7 April to 24 November 2003.

‡ Means within columns followed by the same letters are no different ($P \geq 0.05$)

Supplementing Cows During Late Gestation

Philipe Moriel, Assistant Professor and
Elizabeth Palmer, Ph.D. Student, Range Cattle REC, Ona

Introduction

Increased reproductive success can be achieved by increasing body condition score (BCS) at calving so cows can achieve a BCS of 5 to 6 (according to a 1 to 9 scale). In fact, BCS at calving is the most important factor that influences the interval from parturition to first ovulation, overall pregnancy rate, and calving distribution of beef cows. In addition, recent studies have shown that poor nutrition during late gestation can harm fetal development and reduce offspring growth and health (a process called fetal-programming). Thus, the decisions about cowherd supplementation should also include the impact on future offspring performance.

Currently, most fetal programming studies have been conducted with *Bos taurus* cows grazing cool-season forages, and not with cows having *Bos indicus* genetic influence (such as the Brangus cow) and consuming low-quality, warm-season forages. It is unknown if Brangus cows and calves will experience similar positive results under our environmental conditions. Therefore, in 2016, our group obtained funds from *The Florida Cattle Enhancement Board* to evaluate different supplementation strategies for pregnant Brangus cows and their impact on future performance of those cows and calves.

Our study wanted to evaluate 2 points:

(1) if dry distillers grains (DDG) supplementation of cows during the entire late-gestation **(2.25 lb per day for 12 weeks = 189 lb per cow; August to November)** would increase cow reproductive success during the next breeding season and the performance of its offspring after birth;

(2) if concentrating the 189 lb per cow of DDG supplementation during the period of lowest nutrient demand (first 6 weeks after weaning) would be more cost-effective than providing the same 189 lb of DDG over the entire 12 weeks of late-gestation.

What did we initially think would happen?

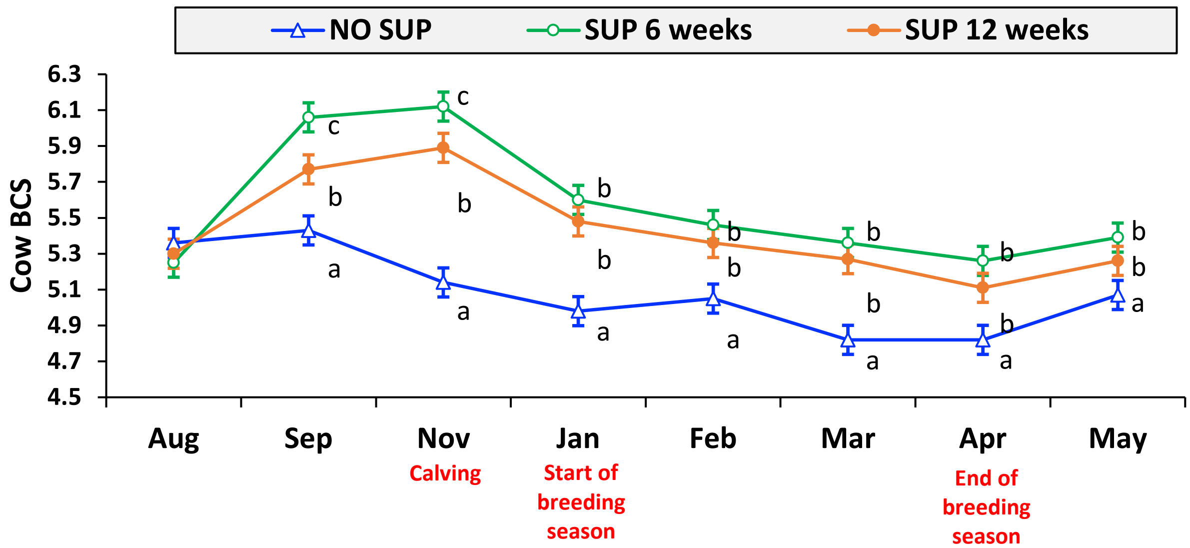
First, we believed that cows supplemented before calving, regardless of length of supplementation, would have greater reproductive performance than cows that did not receive supplementation before calving. Second, we believed that supplementing **4.50 lb per day for 6 weeks after weaning (189 lb of DDG per cow)** would reduce feed costs while maintaining cow reproduction success, but it would not cause fetal-programming effects (due to the shorter supplementation period). In contrast, supplementing **2.25 lb per day for 12 weeks** (also 189 lb of DDG per cow) would increase labor costs, but enhance calf growth after birth. The main question was: ***is the best nutritional management for the cows also going to result in the best impact on future offspring performance?***

What did we actually observe after 3 years of study?

Cow performance: At the time of calving (November), cows that received supplementation for 6 weeks or 12 weeks had greater BCS compared to cows that did not receive supplementation. Also, cows that received 189 lb of DDG supplementation over 6 weeks had the greatest BCS at the time of calving (Figure 1). This latter response indicates that offering the entire supplement amount during the 6 weeks of lowest nutrient requirement was more cost effective than a 12-week supplementation period, because cows supplemented for 6 weeks achieved the greatest BCS at calving and had half of the feeding labor costs compared to cows supplemented for 12 weeks. After calving this advantage disappeared. However, cows supplemented for 6 weeks or 12 weeks still had greater BCS at the start of the breeding season and during the entire breeding season compared to cows that did not receive supplementation before calving.

Unfortunately, no differences were observed for final pregnancy rates of cows (Table 1). The reason for that lack of treatment effect is likely because the control cows started and calved at an optimal BCS (on average 5.2) so the “need” for precalving supplementation was not high. However, even though final pregnancy rates did not differ among treatments, calving distribution was impacted (Figure 2). More cows calved during the first 5 weeks of the calving season if they had received precalving supplementation during the 6 weeks of lowest nutrient requirement, which is likely a result of these cows having the greatest BCS at the time of calving. It is important that cows calve as soon as possible because that leads to a more concentrated calving season, gives cows more time to recover their BCS before the next breeding season, and leads to heavier and older calves at the time of weaning.

Figure 1. Body condition score of cows that received no supplementation before calving (NOSUP), and cows that were supplemented with 4.50 lb of dried distillers grains daily for 6 weeks after weaning (SUP 6 weeks) or with 2.25 lb of dried distillers grains daily for 12 weeks after weaning (SUP 12 weeks). After calving, all cows received 4 lb per day of molasses dry matter until the end of the breeding season in April.



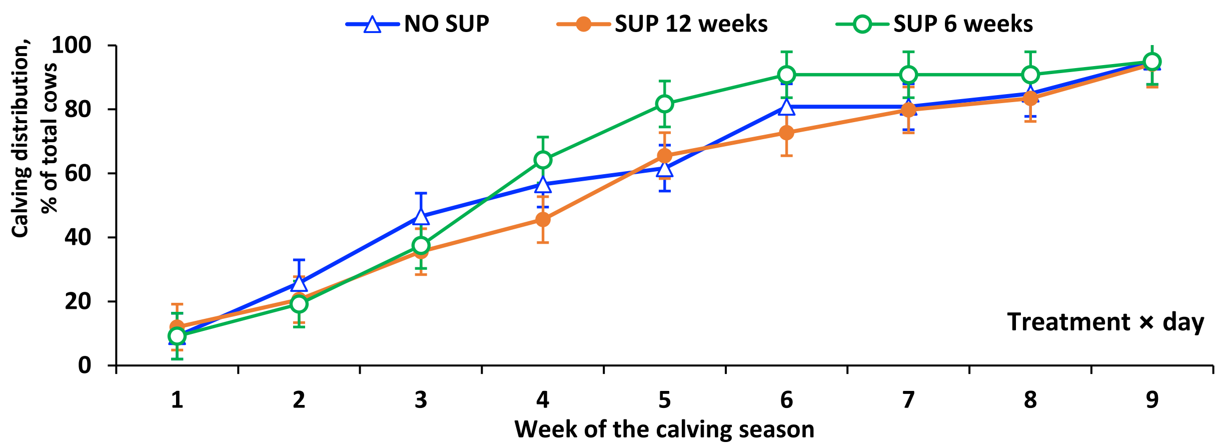
[a-b] Within month, means without a common superscript differ ($P \leq 0.05$).

Table 1. Reproductive performance of cows (and preweaning growth of their offspring) that received no supplementation before calving (NOSUP), and cows that were supplemented with 4.50 lb of dried distillers grains daily for 6 weeks after weaning (SUP 6 weeks) or with 2.25 lb of dried distillers grains daily for 12 weeks after weaning (SUP 12 weeks). After calving, all cows received 4 lb per day of molasses dry matter until the end of the breeding season in April.

	Treatment during late gestation				
Item	**NO SUP**	**SUP 12 weeks**	**SUP 6 weeks**	**SEM**	***P-value***
Pregnant cows (May), %	90.1	91.8	88.0	4.15	0.70
Calf birth weight, lb	79.3 [a]	82.4 [b]	81.9 [b]	3.74	0.08
% of calves born alive	98.1	94.3	96.4	2.55	0.58
Calf serum IgG, mg/mL	74.6	77.3	79.0	3.11	0.51
Calf preweaning ADG, lb/day	1.85 [a]	1.97 [b]	1.89 [a]	0.030	0.04

[a-b] Means without a common superscript differ ($P \leq 0.05$).

Figure 2. Calving distribution of cows that received no supplementation before calving (NOSUP), and cows that were supplemented with 4.50 lb of dried distillers grains daily for 6 weeks after weaning (SUP 6 weeks) or with 2.25 lb of dried distillers grains daily for 12 weeks after weaning (SUP 12 weeks). After calving, all cows received 4 lb per day of molasses dry matter until the end of the breeding season in April.

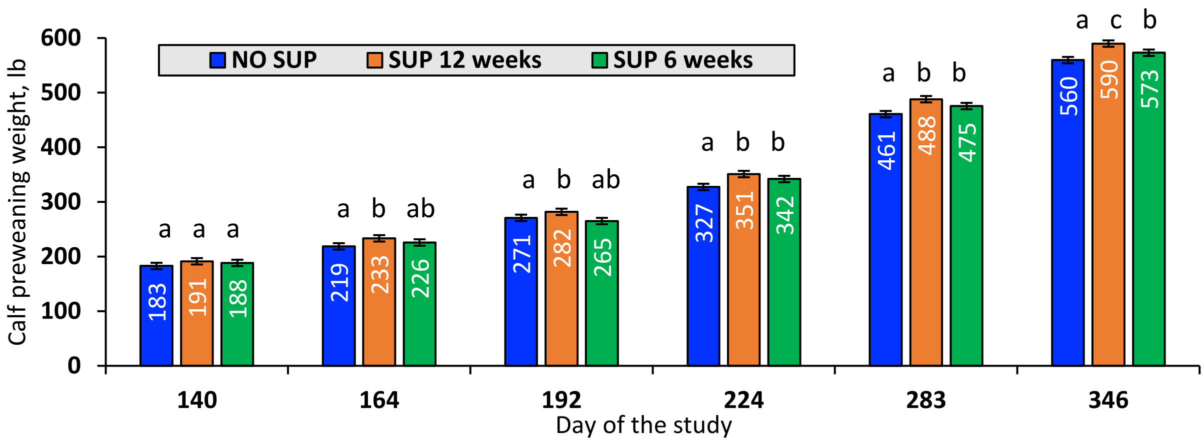


<u>Calf performance:</u> One of the concerns that most people have about precalving supplementation of cows is the subsequent body weight of calves at birth. In our study, calves born from cows that received precalving supplementation (6 and 12 weeks of late gestation) were approximately 3 lb heavier at the time of birth than calves born from cows that had not received supplementation (Table 1). However, this heavier body weight did not increase calving difficulty of cows and had no impact on the percentage of calves born alive (Table 1). Hence, the level of supplementation implemented in this study should not be a concern for commercial cow calf producers unless calving difficulties are being experienced. In this case, precalving supplementation may not be recommended.

Interestingly, calves born from cows that received supplementation for 12 weeks during late were 30 lb heavier at weaning compared to calves born from cows that did not receive precalving supplementation and 17 lb heavier at weaning compared to calves born from cows that received supplementation for 6 weeks during late gestation. These results indicate that, in terms of calf performance, longer periods of supplementation (with smaller daily supplement amount) were required to achieve the greatest calf weaning weights, and that decreasing the length of cow supplementation period limited the increments on calf weaning weights.

Precalving supplement cost was the same between cows supplemented for 6 or 12 weeks as each cow in both of these groups received 189 lb of DDG. Labor costs was approximately $5 per cow for those assigned to 12 weeks of supplementation and $2.5 per cow for those assigned to 6 weeks of supplementation (Table 2). Hence final supplementation cost (supplement + labor) was $24.24 and $26.74 for cows supplemented for 6 vs. 12 weeks, respectively. Calves born from cows that received supplementation during 6 and 12 weeks generated an additional income at weaning of $16.9 and $30 per calf, respectively (assuming calf price @ $1.30/lb). After subtracting the income from additional calf weaning weight from the total precalving supplementation costs, precalving supplementation for 12 weeks generated a profit of $12.27 per cow whereas precalving supplementation for 6 weeks caused a loss of $7.34 per cow. **This study provided evidence that the best nutritional management for cows sometimes does not result in the best outcome to offspring performance.**

Figure 3. Pre-weaning body weight of calves born from cows that received no supplementation before calving (NOSUP), and cows that were supplemented with 4.50 lb of DDG daily for 6 weeks after weaning (SUP 6 weeks) or with 2.25 lb of DDG daily for 12 weeks after weaning (SUP 12 weeks).



[a-b]Means without a common superscript differ ($P \leq 0.05$).

Table 2. Precalving supplementation cost and return.

	NO SUP		SUP 12 weeks		SUP 6 weeks	
Cow precalving labor cost, $/cow	$	-	$	5.00	$	2.50
Cow precalving supplement cost @ 230/ton, $/cow	$	-	$	21.74	$	21.74
Cow labor + supplement cost, $/cow	**$**	**-**	**$**	**26.74**	**$**	**24.24**
Calf extra weaning BW, lb relative to NO SUP calves		0		30		13
Income extra weaning BW @ $1.3/lb, $/calf	**$**	**-**	**$**	**39.00**	**$**	**16.90**
Net return of precalving supplementation, $/cow	**$**	**-**	**$**	**12.27**	**$**	**- 7.34**

Ongoing studies (2019/2020/2021):

STUDY #1

Title: ***Boosting reproduction without increasing feed costs of beef heifers in Florida***

Brief Overview: Previous results obtained at Range Cattle REC (Ona, FL) observed lower pregnancy rates if beef heifers achieved puberty DURING the breeding season (36% pregnancy rate) compared to heifers that achieved puberty BEFORE the start of the breeding season (82% pregnancy rate). Therefore, inducing puberty in beef heifers before the start of the breeding season is crucial for optimal reproductive performance. Research using *Bos taurus* heifers demonstrated that altering the pattern of body weight gain to achieve a low and then high weight gain before breeding increased first conception rates compared to heifers developed on a constant pre-breeding weight gain. This strategy is called Stair-Step strategy and has been successfully implemented in other parts of the country. It is unknown if the Stair-Step strategy would benefit heifers developed in the Florida environment, particularly due the *Bos indicus* genetic contribution and hot/humid summers delaying puberty attainment. Our proposal will explore the Stair-Step strategy to determine if such nutritional strategy should or not be applied in FL production systems.

Objectives: (1) increase reproductive performance of beef heifers in FL by altering the pattern of weight gain before the start of the breeding season; (2) improve our understanding of the differences in the metabolism of heifers under different supplementation strategies, which will assist on designing future studies and harvest greater performance levels; and (3) generate novel information to further assist stakeholders on nutrition for young beef females, and ultimately, expand their annual calf production.

Significant Findings to date: The study began in August 2019. No data are available at this moment.

Future work (what's next?): The results collected will help us decide future studies regarding the timing of compensatory growth for beef heifers that leads to optimal responses on growth and reproductive performance while minimizing feed costs.

When will research be complete? December 2021

STUDY #2

Title: ***Decreasing the frequency of pre-calving supplementation without impacting future performance of beef cows and their calves***

Brief Overview: Previous results obtained at the Range Cattle REC (Ona, FL) demonstrated that energy and protein supplementation during late gestation of beef cows led to different impacts on cow and calf performance, and the optimal pre-calving supplementation strategy for beef cows (lowest labor costs and best cow performance) did not lead to the greatest positive impacts on pre-weaning growth and post-weaning immunity of calves. Therefore, our laboratory is committed to continue searching for optimal precalving supplementation strategies that promote both cow and calf performance. This study will evaluate what is the lowest frequency of supplementation that can be provided to pregnant cows that does not negatively impact the post-calving performance their calves.

Objectives: (1) increase their body condition score at calving and pregnancy rates compared to no pre-calving supplementation while simultaneously decreasing feeding costs; (2) improve calf development during late-gestation and impact their subsequent health and growth leading to greater cowherd profitability; (3) understand the differences in the metabolism of mature cows (and their calves) under different pre-calving supplementation strategies, which will assist in designing future studies and harvest greater performance levels; and (4) generate novel information to further assist producers and county agents on cowherd supplementation strategies, and ultimately, expand their annual calf production.

Significant Findings to date: The study began in August 2019. No data are available at this moment.

Future work (what's next?): Upon collecting all data, we will determine which is the minimal supplementation frequency of dried distillers grains during late gestation that does not impede cow and calf performance. Subsequent studies will replicate this approach of multiple frequencies but also include different supplement type (liquid vs. dry) and composition (high vs. low protein, for example).

When will research be complete? July 2021

STUDY #3

Title: ***Pre-calving supplementation of monensin and its impacts on cow and calf performance***

Brief Overview: Previous results obtained at the Range Cattle REC (Ona, FL) demonstrated that energy and protein supplementation during late gestation of beef cows may promote both cow and calf future performance. Monensin is a feed additive widely used in beef production that positively impacts the physiology and performance of beef cattle. Monensin leads to improved feed efficiency in the feedlot, reduced coccidiosis infestation in nursing and early-weaned calves, and positively shifts the levels of hormones and metabolites associated with energy and protein metabolism. Limited data are available regarding the impacts of monensin during pregnancy of mature cows. This study will evaluate if pre-calving fortification of supplements with monensin will impact the physiology and body condition score gain during late gestation of beef cows, and consequently, impact the future pre-weaning performance of beef calves.

Objectives: (1) increase their body condition score at calving and pregnancy rates by adding monensin to pre-calving supplement; (2) improve calf development during late-gestation and impact their subsequent health and growth due to the positive effects on physiology of beef cows supplemented with monensin before calving; (3) understand the differences in the metabolism of mature cows (and their calves) under different pre-calving supplementation strategies; and (4) generate novel information to expand the annual calf production in Florida.

Significant Findings to date: The study began in August 2019. No data are available at this moment.

Future work (what's next?): Upon collecting all data, we will determine which is the minimal supplementation frequency of dried distillers grains during late gestation that does not impede cow and calf performance. Subsequent studies will replicate this approach of multiple frequencies but also include different supplement type (liquid vs. dry) and composition (high vs. low protein, for example).

When will research be complete? July 2021

STUDY #4

Title: ***Combining pre- and post-calving nutrition to boost beef cattle production in Florida***

Brief Overview: Long-term growth and health of beef calves can be modulated by boosting pre-calving nutrition of cows and calf nutrition after birth (post-calving nutrition). However, little is known about the outcomes of combining both pre- and post-calving nutritional strategies on long-term performance of the offspring, particularly in *Bos indicus*-influenced beef cattle under tropical/subtropical environments as in Florida. The hypothesis of this study is that enhancing calf nutrition after birth would: (1) overcome the negative impacts of a nutrient deficiency experienced by cows that did not receive pre-calving supplementation; and (2) further enhance the positive impacts of supplementing pregnant cows on future performance of *Bos indicus*-influenced calves. If our hypothesis is correct, the results obtained by this study will lead to the development of specific nutritional strategies to further enhance the production of high-quality beef from *Bos indicus*-influenced cattle in Florida.

Objectives: This proposal will combine cow pre-calving supplementation with concentrate and calf early-weaning plus high-concentrate diets to positively impact the offspring growth, immunity and carcass quality.

Significant Findings to date: The study began in August 2019. No data are available at this moment.

Future work (what's next?): If combining pre- and post-calving nutrition causes additive effects on calf performance, we will evaluate the impact of the same strategy on puberty attainment of beef heifers. And design multiple variations of experimental design (for example, age at early weaning, diet composition following early weaning, breed, etc.).

When will research be complete? July 2021

Herbicide Use during Pasture Establishment

Brent Sellers, Professor and Joe Vendramini, Professor, Range Cattle REC, Ona and Marcello Wallau, Assistant Professor, UF Agronomy Dept., Gainesville

Pasture establishment is an expensive venture, and it is important to get the forage growing as quickly and vigorously as possible. In addition to soil conditions, weed management is a must to allow rapid forage growth. This publication will detail techniques for chemical weed control prior to and during pasture establishment.

The soil is full of weed seeds, which are commonly referred to as a soil seed bank. In pastures in need of renovation, it can be expected that weed control during and after pasture establishment will be necessary. This is true even for pastures that were relatively weed-free prior to renovation.

The first step in pasture renovation should include removing the existing vegetation. In most cases, 3 to 4 qt/acre of glyphosate will kill all living plant material, except for woody species. For some species, such as palmetto, more drastic measures are necessary. Once the plant material is dead, it will be necessary to till the pasture repeatedly, first with a moldboard plow, followed by repeated disking and/or rotovating. Repeated tillage is necessary to prepare a clean, weed-free seed bed prior to planting. By spacing tillage applications 2 to 3 weeks apart, many weeds will germinate from seed, then be destroyed by subsequent tillage. This repeated tillage will help to deplete the soil seed bank.

The next step entails planting the desired forage. The University of Florida has detailed instructions for establishing forage grasses. See EDIS publication SS-AGR-161 (https://edis.ifas.ufl.edu/ag107) entitled Forage Planting and Establishment Methods or consult your county agent for such recommendations.

Most weeds will emerge shortly after the grass has been planted. Therefore, time is of the essence for weed control operations. In most cases, sedges tend to be the most problematic, but broadleaf weeds also can quickly become established. The following will outline the best weed control strategies for each pasture grass.

<u>Bahiagrass (Argentine, Pensacola, Tifton-9, etc.).</u> Herbicides should not be applied to young bahiagrass seedlings. Apply herbicides only after bahiagrass has at least 6 inches of growth. Herbicides such as Velpar/Tide Hexazinone, Outrider, Pasturegard, and Remedy should not be applied during the year of establishment. Research on Argentine bahiagrass has shown that it is tolerant to GrazonNext HL at 20 oz/A when applied as early as 4 weeks after planting when bahiagrass plants were approximately 2-3 inches tall.

<u>Bermudagrass (Florakirk, Jiggs, Tifton-85, Mislevy, etc.).</u> Apply 2 pt/acre of WeedMaster or any other product containing 2,4-D + dicamba 7-10 days after planting. Diuron is another herbicide that is useful for controlling crabgrass and

other weeds, but the bermudagrass sprigs must be planted 2 inches deep. Apply Diuron at 2 quarts/acre. **Do not** apply Diuron if you are planting tops and crimping material into the soil as it will cause severe injury.

Stargrass (Florico, Florona, Okeechobee, Ona). Apply 2 pt/acre of WeedMaster or any other product containing 2,4-D + dicamba 7-10 days after planting. Alternatively, apply 0.78 lb 2,4-D with 0.22 lb of dicamba.

Limpograss (Floralta, Kenhy, Gibtuck). Apply 0.75 lb/acre of dicamba 7-10 days after planting. There are several dicamba-containing products. Limpograss is sensitive to 2,4-D applications during establishment.

In all cases, it is best to apply herbicides within the 7 to 10 day window after planting. If herbicides are applied within this time frame, pastures will become established much quicker than without herbicide applications. Alternatively, mowing several times will likely be necessary for the forage to obtain complete groundcover.

Outrider herbicide

Many are aware of Outrider being used in the past. Currently, Outrider can be used in established bahiagrass and bermudagrass pastures. In the past, when Outrider was sold by Monsanto, we had supplemental labels that allowed for applications of this herbicide during the establishment of warm season grasses including bermudagrass, stargrass, and limpograss. However, since Monsanto sold Outrider back to Valent, those supplemental labels lapsed. Therefore, we can no longer make these recommendations. During the past couple of years we have been evaluating application timing with Outrider during the establishment of these warm season grasses. Interestingly, we have had the best long-term weed control when using Outrider at 1 oz/A when applied at 14 days after planting. Therefore, we are hoping to have new supplemental labels indicating that Outrider may be applied as early as 7 days after planting. Early applications are showing residual control of annual grasses and small-seeded broadleaf weeds. Today, you should be able to see the effects of this herbicide on suppressing crabgrass and sedge growth in plots treated at 7 and 14 days after planting versus no suppression at 21 and 28 days after planting.

Agronomic and Environmental Impacts of Land Application of Biosolids to Bahiagrass Pastures in Florida

Maria L. Silveira, Professor, Range Cattle REC, Ona and
Yanyan Lu, Ph.D. Student, Range Cattle REC, Ona

Project Overview

Biosolids have clear agronomic benefits, but concerns over nutrient accumulation in soils and subsequent impacts on water quality can limit land application in Florida. The objectives of this project are (1) to establish a long-term, instrumented, research and demonstration field trial designed to evaluate the agronomic benefits of biosolids and biochar application on bahiagrass production and nutritive value, (2) to monitor the potential effect of biosolids application on water quality, and (3) to evaluate greenhouse gas (carbon dioxide, nitrous oxide, and methane) emissions and the potential impacts of biosolids and biochar application on soil chemical, physical and biological properties. Our principal hypothesis is that most biosolids applied to pastures convey significant agronomic benefits and that they behave as “slow release” nutrient sources with minimal negative environmental impact. Research on the co-application of biochar (fine-grained carbon-rich residue produced through the pyrolysis of biomass) with organic residuals is contemporary. Despite preliminary evidence that biochar may lead to more efficient use of nutrients present in organic amendments, the mechanisms explaining the interaction between biochar and nutrients have not been fully investigated. Biochar chemical and physical characteristics create a strong sorbent that is potentially useful to control the liability of inorganic and organic contaminants in soil and water. For example, research suggests that biochar can retain significant amounts of plant nutrients, particularly N and P and has a great potential to be used in combination biosolids to improve nutrient use efficiency and reduce nutrient losses. Knowles et al. (2011) evaluated application of biosolids (at rates equivalent to 536 and 1071lb total N/A) and concluded that biochar reduced nitrate leaching with no negative impact on ryegrass biomass production. Increases in soil water status and carbon accumulation in response to co-application of biochar and organic residuals have also been reported. Biochar reportedly has many positive agronomic benefits, but research to validate these claims is sparse.

Project Activities

Biosolids (Class AA, which corresponded to highest quality and Class B materials here defined as the minimum quality for beneficial use) were surface applied to the experimental area on April 2016, 2017, and 2018 and compared with mineral fertilizers. Biosolids sources were applied either alone or in combination with biochar to supply an estimated rate of 160 lb plant available N/A/yr, which corresponds to UF/IFAS high N option for established bahiagrass and the most common biosolids application rate used by commercial cow-calf operations in Florida. The availability of the N in the biosolids was estimated using Florida DEP factor of 1.5 [required plant available N (lb/A) * 1.5= total N allowed (lb/A)]. Biochar was also applied in April 2016, 2017, and 2018 at 9 ton/A ha^{-1} rate. Control treatments included plots receiving inorganic commercial fertilizer (ammonium nitrate + triple superphosphate alone and in combinations with biochar) and pastures receiving no biosolids, fertilizer, or biochar. Forage and soil responses, water quality, ground water levels, and gas emissions were monitored during the 2017 and 2018 growing seasons. Soil samples (0 to 36 inches) were collected at the beginning of the experiment and at the end of 2016, 2017, and 2018. Analyses included soil pH, Mehlich-3 extractable P, K, Ca, Mg, Fe, and Al and total C, N, P, and trace element concentrations. Extractable NO_3-N and NH_4-N was also determined. The P saturation ratio [PSR = Mehlich-3-P / (Mehlich-3-Al + Mehlich-3-Fe)] was calculated for each soil depth. The PSR relates to soil P retention capacity. Leachate N and P were monitored in the treatments receiving the class B Bradenton biosolids and commercial fertilizer (total of 24 plots: 1 biosolids material + 1 commercial fertilizer, with or without biochar + 2 control * 4 replicates = 24). Groundwater level, soil moisture content, and weather data were continuously monitored in the experimental site. Leachate samples were collected at 2- or 4-wk intervals and analyzed for total and inorganic P, total N, NO_3-N and NH_4-N concentrations. Greenhouse gas fluxes were measured (same treatment as the water quality monitoring) using the static chamber technique. Gas samples were collected at 14-d intervals and analyzed for carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) concentrations.

Results Summary

Bahiagrass Responses

Compared to control treatments (no N or P added), addition of fertilizer (either as commercial N and P fertilizer or biosolids) increased total annual herbage accumulation by as much as ~74% in 2017 and ~144% in 2018 relative to the control treatment (no fertilizer addition) (Table 1). In 2017, no differences in bahiagrass total annual herbage accumulation were observed among fertilizer sources. However, in 2018, total annual herbage accumulation of aerobically-digested Class B biosolids and inorganic fertilizer increased by ~ 18% relative to 2017, which resulted in greater total annual herbage accumulation than the other biosolids treatments (~29%).

Biosolids and fertilizer increased bahiagrass crude protein concentration by as much as ~22 and ~39% in 2017 and 2018, respectively, relative to the control treatment. In 2017, biosolids generally resulted in similar crude protein as inorganic fertilizer; however, greater crude protein concentration was associated with the aerobically-digested Class B biosolids (114 g kg^{-1}) relative to other fertilizer treatments (average of 102 g kg^{-1}) in 2018. Similarly, only the aerobically-digested Class B biosolids increased crude protein concentration from year 2017 to 2018; no year differences were observed for the other fertilizer treatments. No differences among fertilizer sources in IVDOM were observed in 2017. No year effect was observed for the biosolids treatments; however, IVDOM decreased by as much as ~12% from 2017 to 2018 in the control and inorganic fertilizer treatments.

Results from this study indicated that biosolids application can supplement or replace inorganic fertilizer in bahiagrass pastures, with the added benefit of providing a more continuous supply of nutrients throughout the growing season. No effect of biochar on bahiagrass responses was observed.

Water Quality and Greenhouse Gas Responses

A total of 36 sampling events occurred during the 3-yr study but significant treatment effects were only observed in 7 sampling events. Leachate nitrate-nitrogen (NO_3-N) concentrations ranged from 0.003 to 10 mg L^{-1} while leachate SRP concentrations ranged from 0.002 to 64 µg L^{-1}. Application of biosolids (either alone or in combination with biochar) had no significant impact on water quality and greenhouse gas emissions. However, when bahiagrass received commercial inorganic fertilizer, large pulses of N and P were observed immediately after fertilizer application (Figure 1). Inorganic fertilizer increased leachate SRP concentrations nearly 16-fold relative to biosolids treatment. There was no difference in leachate NO_3-N and SRP concentrations between biosolids and control treatments across entire sampling period

Similar responses were also observed for nitrous oxide emissions (data not presented). Greater nitrous oxide emissions were generally associated with the treatments receiving commercial fertilizer, particularly during the first few weeks following fertilization application. These results indicated that N and P losses associated with treatments receiving biosolids can be lower than commercial fertilizer and do not result in increased greenhouse gas emissions. Results also indicated no potential benefit of biochar in reducing N and P losses.

ACKNOLEDGEMENTS -We thank the Florida Cattle Enhancement Board for providing the funds to support this project. We also want to extend our appreciation to H&H Liquid Disposal for their assistance obtaining and hauling the biosolids materials to the study site.

Table 1. Bahiagrass total annual herbage accumulation as affected by fertilizer source and year

Fertilizer source	Year	
	2017	2018
	-------------------lb/A---------------	
Control	5373 b(A)†	4456 d(A)
Thermally-dried Class AA biosolids	9368 a(A)	9231 bc(A)
Aerobically-digested Class B biosolids	8547 a(B)	10113 ab(A)
Anaerobically-digested Class B biosolids	9317 a(A)	8423 c(A)
Inorganic fertilizer	8984 a(B)	10865 a(A)
SE	494	
P value	<0.0001	

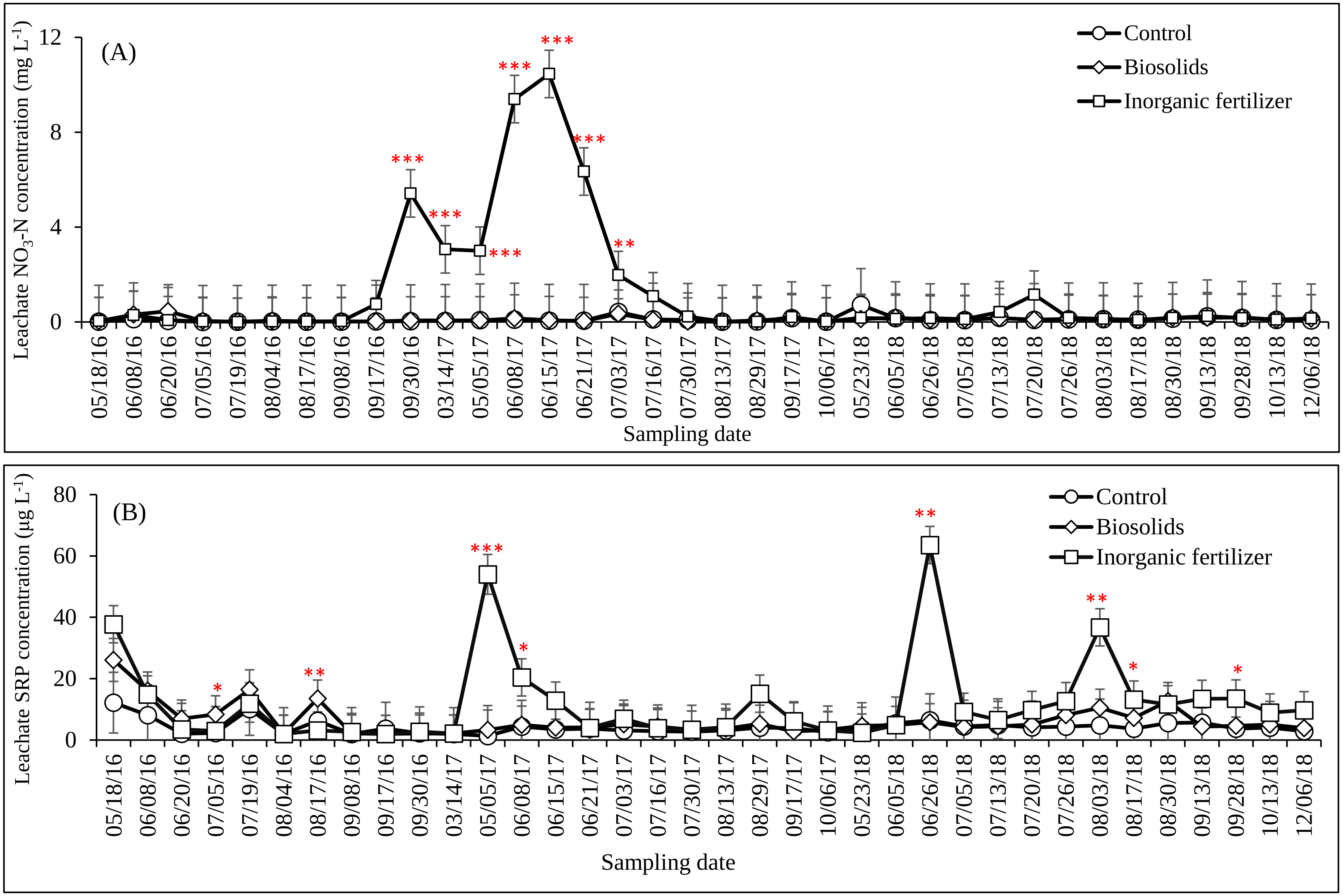
†Total annual herbage accumulation corresponded to the sum of three harvest events per year. Data represent the average across biochar treatments (with or without biochar) and 4 replicates (n= 8). Same lowercase letters within columns and uppercase letters within rows are not different ($P > 0.05$).

Table 2. Bahiagrass crude protein (CP) and *in-vitro* digestible organic matter (IVDOM) concentrations as affected by fertilizer source and year

Year	Control	Thermally-dried Class AA biosolids	Aerobically-digested Class B biosolids	Anaerobically-digested Class B biosolids	Inorganic fertilizer
	---CP† (g kg^{-1}) ---				
2017	88 aC	101 aB	106 bAB	107 aA	102 aAB
2018	82 bD	98 aC	114 aA	103 aBC	104 aB
SE	2.3				
P value	0.0052				
	---IVDOM (g kg^{-1}) ---				
2017	382 aA	382 aA	372 aA	371 aA	379 aA
2018	340 bC	375 aA	378 aA	367 aAB	353 bBC
SE	6				
P value	<0.0001				

†Means represent the average across biochar treatments (with or without biochar) and 3 harvest events each year (n= 24). Same lowercase letters within columns and uppercase letters within rows are not different ($P > 0.05$).

Figure 1. Leachate NO_3-N and soluble reactive P (SRP) concentrations as a function of fertilizer source and sampling date. Data represent average across replicates and biochar application (n=8). *significant at the 0.05 probability level; ** significant at the 0.01 probability level; *** significant at the 0.001 probability level.



Boehringer Ingelheim

Cattle First.

RID CATTLE OF PARASITES,

AND THEY HAVE A WAY OF SHOWING THEIR APPRECIATION.

Eprinex® (eprinomectin) is proven to pack on an average of 36 pounds per head over 105 days,[1] more than other pour-on dewormers. Maybe it's because it's the first dewormer to kill 39 species and stages of internal and external parasites.[2] Find EPRINEX near you at EPRINEX.com/retailers. Because heavier cattle is something you can appreciate.

EPRINEX IMPORTANT SAFETY INFORMATION: No meat or milk withdrawal is required when used according to label. Do not use in calves intended for veal or unapproved animal species, as severe adverse reactions, including fatalities in dogs, may result.

[1] Beckett J. Efficacy of pour-on dewormers differing in active ingredient and carrier on weight gain and fecal egg count in stocker beef cattle. College of Agriculture, Cal Poly State University. [2] Based on FOI summaries and label claims.

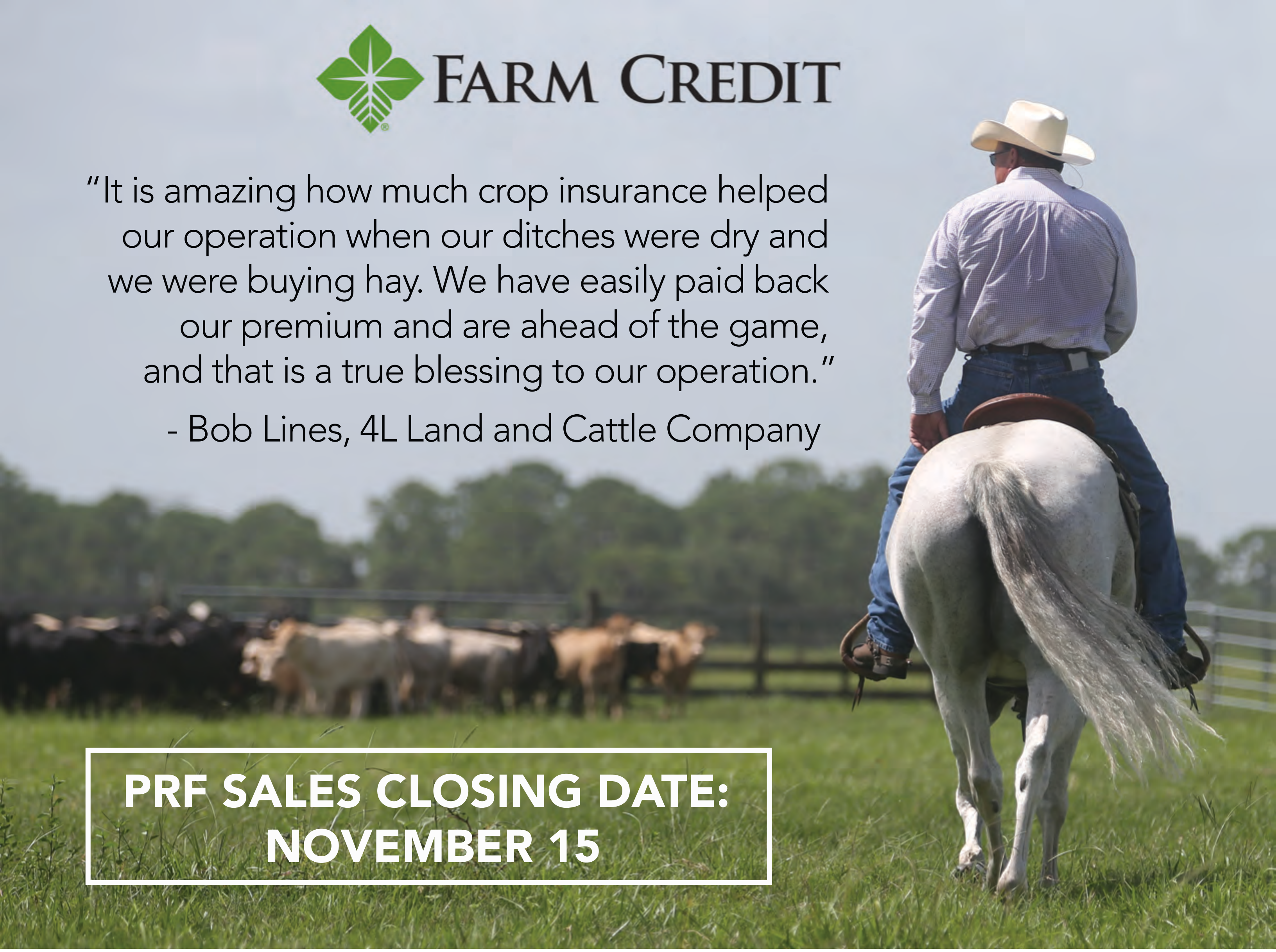

Deseret Ranches
of Florida

BUILDING ON 75 YEARS OF TRUST DIAMOND V

Diamond V®

The Trusted Experts In Nutrition & Health®

For more information, visit www.diamondv.com/natursafe



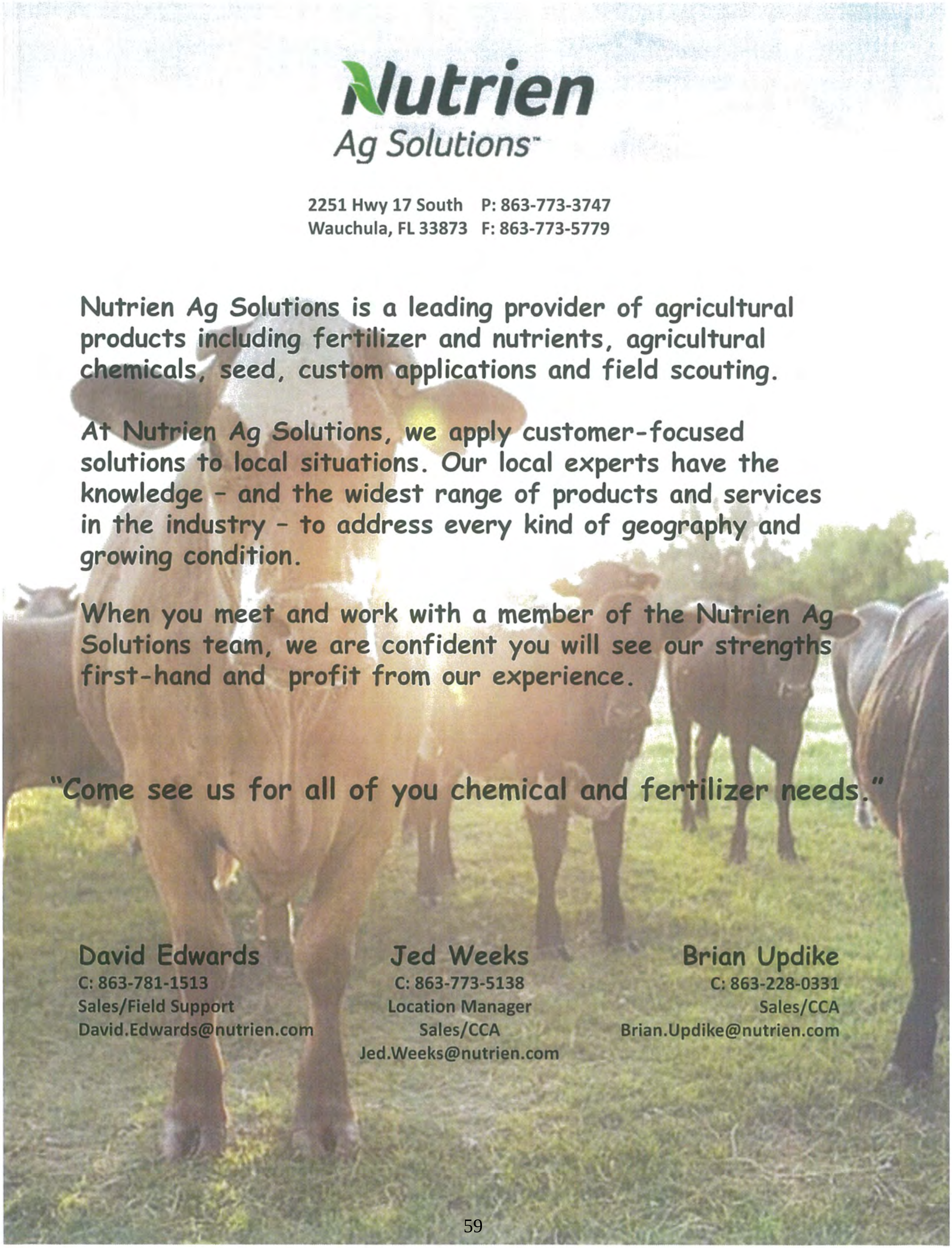
Pasture, Rangeland, & Forage (PRF) Program

Forage losses from natural hazards are frequent. PRF Insurance is an excellent tool producers can use to provide income that offsets the loss of forage, hay production, and grazing due to dry conditions. Insurance coverage under the Rainfall Index Program is for a single peril - lack of rainfall. At Farm Credit, we want to make sure you are getting the most out of your Rainfall Index policy.

Please contact one of our knowledgeable crop insurance agents to craft a new policy or receive a complimentary policy evaluation.

FarmCreditFlorida.com | 866.824.5626

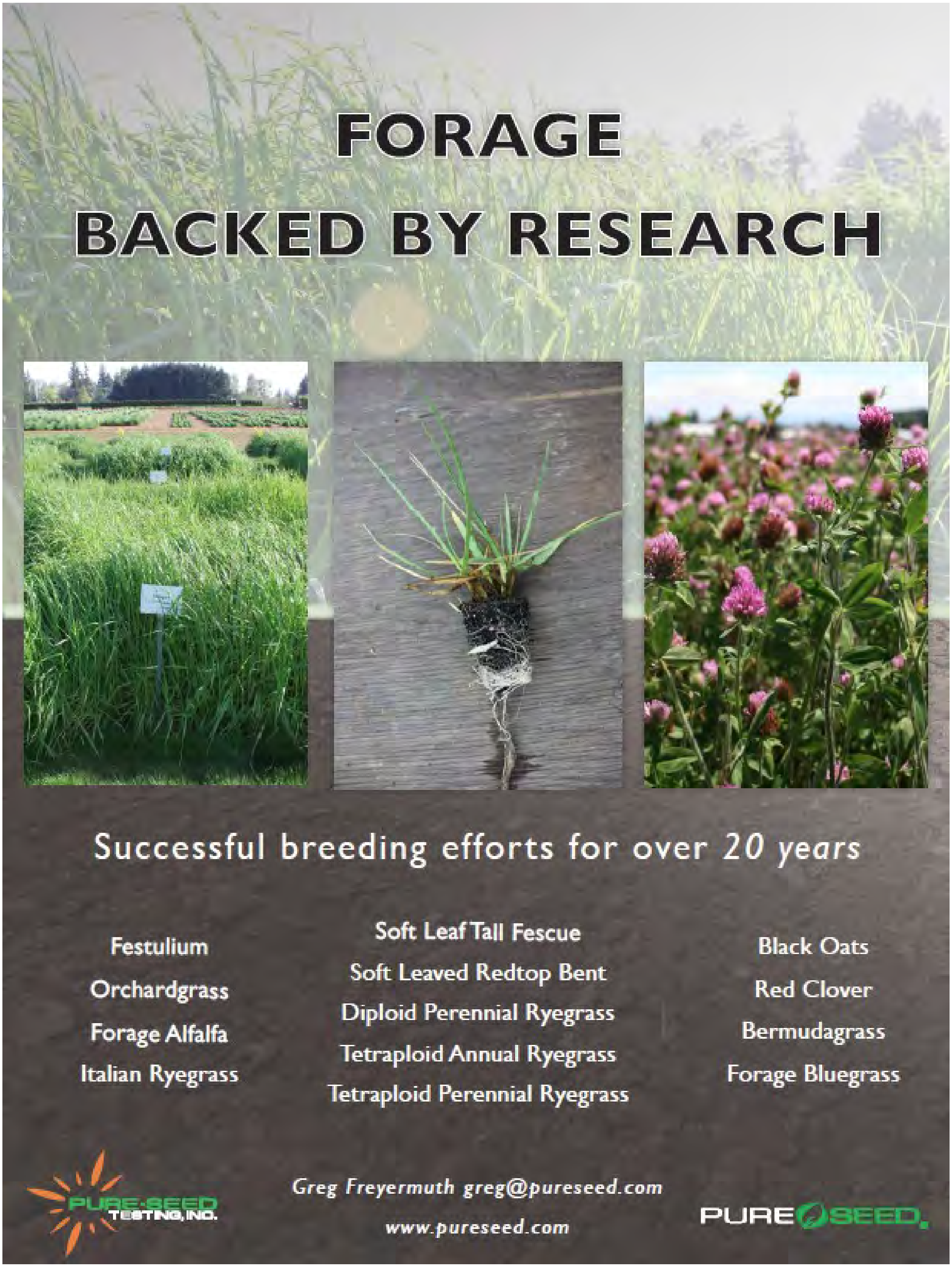

Your name
means everything.
We get it. Your brand is your legacy – what you fight for and work to leave behind.
We're proud to stand by you with a spirit of innovation, a passion that runs as deep as yours and a guiding integrity that drives us to do what's right.
For your operation and for you
That's why Merck Animal Health Works.
Learn more at MAHCattle.com.
MERCK
Animal Health
ZUPREVO (tildipirosin)
safe-guard (fenbendazole)
vista
Vision
RALGRO
merck-animal-health-usa.com 800-521-5767
© 2019 Intervet Inc., doing business as Merck Animal Health,
a subsidiary of Merck & Co., Inc. All rights reserved. US/ALL/0219/0041


Nutrien
Ag Solutions™
2251 Hwy 17 South P: 863-773-3747
Wauchula, FL 33873 F: 863-773-5779
Nutrien Ag Solutions is a leading provider of agricultural products including fertilizer and nutrients, agricultural chemicals, seed, custom applications and field scouting.
At Nutrien Ag Solutions, we apply customer-focused solutions to local situations. Our local experts have the knowledge - and the widest range of products and services in the industry - to address every kind of geography and growing condition.
When you meet and work with a member of the Nutrien Ag Solutions team, we are confident you will see our strengths first-hand and profit from our experience.
"Come see us for all of you chemical and fertilizer needs."
David Edwards
C: 863-781-1513
Sales/Field Support
David.Edwards@nutrien.com
Jed Weeks
C: 863-773-5138
Location Manager
Sales/CCA
Jed.Weeks@nutrien.com
Brian Updike
C: 863-228-0331
Sales/CCA
Brian.Updike@nutrien.com

Ronnie Barron, General Manager

P. O. Box 570

Bartow, Florida 33831


FORAGE
BACKED BY RESEARCH
Successful breeding efforts for over 20 years
Festulium
Orchardgrass
Forage Alfalfa
Italian Ryegrass
Soft Leaf Tall Fescue
Soft Leaved Redtop Bent
Diploid Perennial Ryegrass
Tetraploid Annual Ryegrass
Tetraploid Perennial Ryegrass
Black Oats
Red Clover
Bermudagrass
Forage Bluegrass
PURE-SEED TESTING, INC.
Greg Freyermuth greg@pureseed.com
www.pureseed.com
PURE SEED

Compliments of:

ROMAN THREE RANCH

III

DOYLE CARLTON III
& FAMILY


TIDE HEXAZINONE 2SL
KEEP OUT OF REACH OF CHILDREN
WARNING/AVISO
TIC
Tide International USA, Inc.
NOW YOU HAVE AN ECONOMICAL ALTERNATIVE TO VELPAR ™
Tide Hexazinone 2SL
Herbicide


W & W Supply Co. of Florida, Inc.
Veterinary Supplies
2300 NW 9th St. Okeechobee, FL
Phone: (863) 763-0261 Fax: (863) 763-1636
Generator On Site
We appreciate your business over the past year, and we'll continue to try hard to earn it.
When electric fails, we still keep your vaccines cool. Two condensing units for backup cooling and our own refrigeration company
REFRIGERATION PRODUCTS
ANOTHER REASON OUR SERVICE IS SUPERIOR!

Bovi-Shield GOLD® HB

GIVE YOUR COWS THE HIGHEST LEVEL OF FETAL PROTECTION AVAILABLE

Bovine viral diarrhea (BVD) is one of the biggest challenges for any operation — especially when it comes to reproduction. Help protect your herd with the **BOVI-SHIELD GOLD FP® 5** and **BOVI-SHIELD GOLD FP 5 HB** vaccine lines from Zoetis. They offer the strongest level of fetal protection against BVD Types 1 and 2 viruses of any product line on the market. Plus, they aid in prevention of abortion caused by infectious bovine rhinotracheitis (IBR) virus. Best of all, both are backed by the Zoetis Fetal Protection Guarantee.

THE COSTLY IMPACT OF BVD VIRUS FETAL INFECTION:[1]

INFECTION AT **0-40 DAYS** GESTATION CAN LEAD TO:	INFECTION AT **40-120 DAYS** GESTATION CAN LEAD TO:	INFECTION **UP TO 160 DAYS** GESTATION CAN LEAD TO:	INFECTION **AFTER 160 DAYS** GESTATION CAN LEAD TO:
EARLY EMBRYONIC DEATH	ABORTION	ABORTION	HIGHER RISK OF SERIOUS HEALTH PROBLEMS IN THE FIRST YEAR OF A CALF'S LIFE
OPEN COWS	BVD PI CALVES	BIRTH DEFECTS	
LATE-CALVING COWS		WEAK CALVES	
		STILLBIRTHS	

KEEP YOUR HERD AND BOTTOM LINE HEALTHY.

The BOVI-SHIELD GOLD FP 5 and BOVI-SHIELD GOLD FP 5 HB vaccines help provide the highest level of fetal protection to maximize the reproductive potential of your cows, helping to ensure a healthy, productive calf every year. Learn more at **CattleReproVaccines.com**.

zoetis™

Join us for an Upcoming Ona Highlight

We invite you to join us each month for an engaging and educational presentation to learn about research being done by our faculty and students and occasionally hear from a guest presenter. Presentations are held on the 2nd Tuesday of each month in the Grazinglands Education Building at 11:00 a.m. and last approximately 45 minutes. You are welcome to attend in person (call to register: 863-735-1314) or by webinar. Visit our online calendar for the links to register: http://rcrec-ona.ifas.ufl.edu/calendar-of-events/

Past webinars (recordings and slides) are available on our website at http://rcrec-ona.ifas.ufl.edu/virtual-classroom/webinars/

2019 Schedule

Nov. 19	Marta Kohmann, Postdoctoral Associate Assessing the Effect of Prescribed Fire Frequency and Association with Chopping on Sustainability of Southern Florida Rangelands
Dec. 10	Liz White, Ph.D. Candidate Reproduction and Space-use of Burrowing Owls on Florida Cattle Ranches

2020 Schedule

Jan. 14	Brent Sellers, Professor Whitehead Broom Management
Feb. 11	Joao Vendramini, Professor Additives and Inoculants to Improve Warm-Season Grass Silage Quality
March 10	Maria Silveira, Professor Utilization of Biosolids in Forage Production Systems in Florida
April 14	Chris Prevatt, State Specialized Agent II Searching for the Bottom of the Cattle Price Cycle
July 14	Brent Sellers, Professor Use of Liquid Nitrogen Fertilizer with Hexazinone for Smutgrass Control
August 11	Gene Lollis President & Jim Handley, Executive Vice President Florida Cattlemen's Association Activity Report on State and Federal Legislation and other Issues
Sept. 8	Mario Binelli, Assistant Professor UF Department of Animal Sciences Reproductive Management Strategies for Beef Cattle in Florida
Nov. 10	Philipe Moriel and Elizabeth Palmer Pre-Calving Nutrition of Beef Females

Speakers are yet to be determined for May 12, June 9, Oct. 13, and Dec. 8.

UF | IFAS Research
UNIVERSITY of FLORIDA

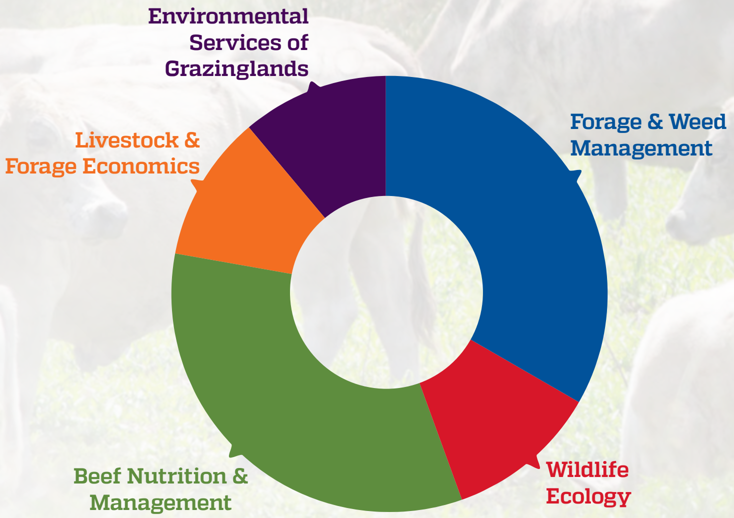
Range Cattle REC

By the Numbers

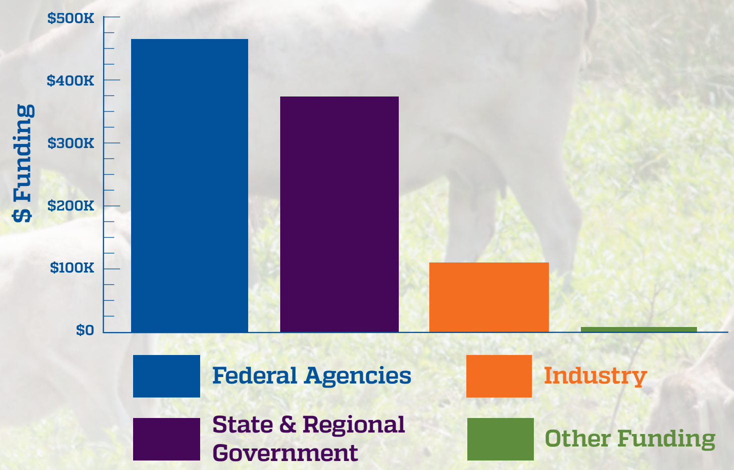


Our research responds to emerging challenges and opportunities facing grazinglands, among them increasing costs of fertilizers and fuel; loss of grazing land to urbanization and public acquisition; and the environmental impacts and ecological benefits of pasture- and rangeland-based animal production.

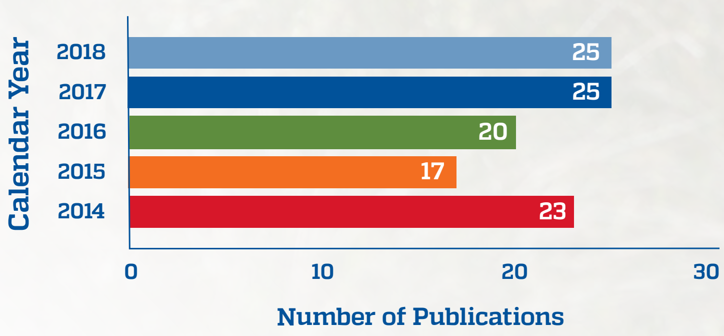
Current Research Program Efforts



Sponsored Program Awards (FY18)



Refereed Journal Publications



Faculty Distribution (CY18)

rcrec-ona.ifas.ufl.edu
863-735-1314
@UF.IFAS.RCREC
@UF_IFAS_RCREC