



# INFLUENCE OF THE KYMINASI CROP BOOSTER™ IRRIGATION TECHNOLOGY ON PRODUCTION AND QUALITY OF GRASSLANDS OF THE UFPSO\* EXPERIMENTAL FARM

Colombia, 2024

1. Harvest Harmonics Summary (4 pages)
2. **Cundinamarca University** and **Santander University**  
Presentation of trial results (38 pages)\*\*

\* *Universidad Francisco de Paula Santander Seccional Ocaña (The University of Santander in Ocaña, Colombia)*

\*\* *With yellow highlights by Harvest Harmonics' Science Team*



# Forage – Colombia – Cundinamarca University – 2024

## OVERVIEW

This trial was set up in a controlled environment to test the effect of Kyminasi Plants – Plant Booster™ (KPCB) on forage growth, yield and quality for animal feed.

## TIME

- KPCB installed: Mar. 4, 2024
- Fertilization: between Feb. 28, 2024, and Mar. 05, 2024
- Harvest dates: each species was harvested 35 days after regrowth from previous grazing. Harvesting dates: Apr. 8, 2024; May 13, 2024; Jun. 18, 2024

## LOCATION

- Place: The Experimental Farm, University of Santander, Colombia
- 10 plots were studied, with a total area of 2,658 m<sup>2</sup> (0.7 acre)
- Treated (KPCB) 5 plots: area 258 m<sup>2</sup> (0.06 acre) each on average
- Control 5 plots: area 273 m<sup>2</sup> (0.07 acre) each on average





# Forage – Colombia – Cundinamarca University – 2024

## DETAILS

- Technology Tested: Kyminasi Plants – Plant Booster™ (KPCB) with organic farmer practice
- Control: same organic farmer practice, without KPCB
- Irrigation Type: sprinklers. Irrigation was carried out 3 times a week, 1.5 hours each, for a period of 105 days divided into 3 cuts of 35 days each
- Crop: Forage mix
- Species:
  - Guinea grass (*Megathyrsus maximus*)
  - Jiggs (Bermuda grass – *Cynodon dactylon*)
  - Buttercup (*Thitonia diversifolia*)





# Forage – Colombia – Cundinamarca University – 2024

## RESULTS SUMMARY

Results are presented below as NET GAIN over Control values for each major parameter of plant growth, health and animal feed value:

	Guinea grass (Megathyrus maximus)	Thitonia diversifolia	Jiggs (Bermuda Grass, Cynodon dactylon)
Cutting Height	+93%	+54%	Results for this species are not evaluated in this summary because there was no Control plot for it. The results can be found in the researchers' presentation below.
Capacity (Green Foliage)	+124%	+205%	
Dry Matter Capacity	+187%	+230%	
Plant Height	+73%	+46%	
Stem Diameter	+50%	+15%	
Total Number of Leaves	+54%	+34%	
Number of Green Leaves	+85%	+43%	
Number of Dry Leaves	7% improvement	31% improvement	
Penultimate Leaf* Length	+157%	+40%	
Dry Matter	+22%	+12%	
Crude Protein	+22%	+12%	
Ash	5% improvement	+9.2	
Ethereal Extract [Crude Fat]	+50%	+16%	
Crude Fiber	+11	+21%	

\* The leaf immediately below the topmost leaf. It plays a significant role in the plant's growth and yield.



# Forage – Colombia – Cundinamarca University – 2024

## CONCLUSIONS

Harvest Harmonics Corp, who has provided the technology for this trial but did not pay for it, evaluated that applying irrigation with Kyminasi Plants – Plant Booster™ (KPCB) technology grown with organic practices, has brought about forage that is not only plentiful, but also healthier and more productive for animal grazing and animal feed.

The researchers concluded (extract): *“These data suggest that the use of KPCB allows **improving the chemical composition of forages**, being a fundamental basis for feeding systems in animal production.*

*On the other hand, production costs in production systems are very important in this study. It was observed that the implementation of conventional irrigation and KPCB irrigation showed that innovative technologies can improve not only forage production, but also present **sustainable benefits by improving the chemical composition** of pastures **and optimizing water resources**, allowing greater profitability and more efficient management of limited agricultural resources in production.*

*“By improving the efficiency in the use of water resources, **sustainable production** systems are promoted, contributing to **regional food security**.”*



**UDEC**  
UNIVERSIDAD DE  
CUNDINAMARCA



Harvest Harmonics' comments  
in yellow highlights

# INFLUENCE OF THE KYMINASI CROP BOOSTER™ IRRIGATION TECHNOLOGY ON PRODUCTION AND QUALITY OF GRASSLANDS OF THE UFPSO\* EXPERIMENTAL FARM

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Zootechnics

2024

# Efficient Fertilization with Goat manure and Microorganisms



# Goat manure composition – application by plot

Parameter	Units	Results	Method used
Dry matter	%	65.37	Gravimetric (oven at 65°C and 105°C)
Humidity	%	34.63	By difference
Total Nitrogen	%	2.48	Micro-Kjeldahl
Ashes	%	23.86	Direct incineration in a muffle furnace at 550 °C
Organic matter	%	41.51	By difference
Crude fat	%	0.59	Extraction by Soxhlet method





## Goat manure composition – application by plot



	Plot #	Application
Control	1	
	2	
	3	
	4	
	5	
		315 Kg total
KPCB	23	
	24	
	25	
	26	
	27	

# Plot Arrangement

PLOT	TOTAL AREA m <sup>2</sup>	MEASUREMENT AREA m <sup>2</sup>	TYPE OF FORAGE
1	287.60	163.39	Guinea grass ( <i>Megathyrus maximus</i> ) and Buttercup ( <i>Tithonia diversifolia</i> )
2	236.85	108.62	Guinea grass ( <i>Megathyrus maximus</i> ) 80% and Jiggs grass ( <i>Cynodon dactylon</i> ) 20%
3	297.47	145.32	
4	274.72	143.81	
5	270.38	134.40	
23	246.75	122.57	Jiggs grass ( <i>Cynodon dactylon</i> ) 95% and Guinea grass ( <i>Megathyrus maximus</i> ) 5%
24	257.88	127.83	
25	288.26	153.26	
26	255.52	161.64	
27	242.37	105.76	Guinea grass ( <i>Megathyrus maximum</i> ) and Buttercup ( <i>Tithonia diversifolia</i> )



Plots 1 and 2. Composition Guinea grass  
(*Megathyrsus maximun*) and Buttercup  
(*Thitonia diversifolia*)

CONTROL

**Plots photographed on different growing days**



CONTROL



CONTROL

Plots 3 and 4. Composition Guinea grass (*Megathyrsus maximun*) and Buttercup (*Thitonia diversifolia*)



CONTROL



CONTROL

Plot 1, 25 days since cutting

Composition Guinea grass (*Megathyrsus maximun*) and Buttercup (*Thitonia diversifolia*)



KPCB



KPCB

Plot 26. Jibbs composition (*Cynodon dactylon*)



KPCB



KPCB

Plot 26. Jibbs Composition (*Cynodon dactylon*) Average Cutting Height, and Capacity

# RESULTS: GROWTH PARAMETERS

## Cutting Height Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda grass, Cynodon dactylon*)

### Descriptive statistics

Treatment/Variable	Cutting Height (cm)
Megathyrsus maximus (Control)	33.6 ± 11.61bc
Megathyrsus maximus (KPCB)	64.75 ± 4.48 a <b>(+93%)</b>
Cynodon dactylon (KPCB)	64.9 ± 22.61a

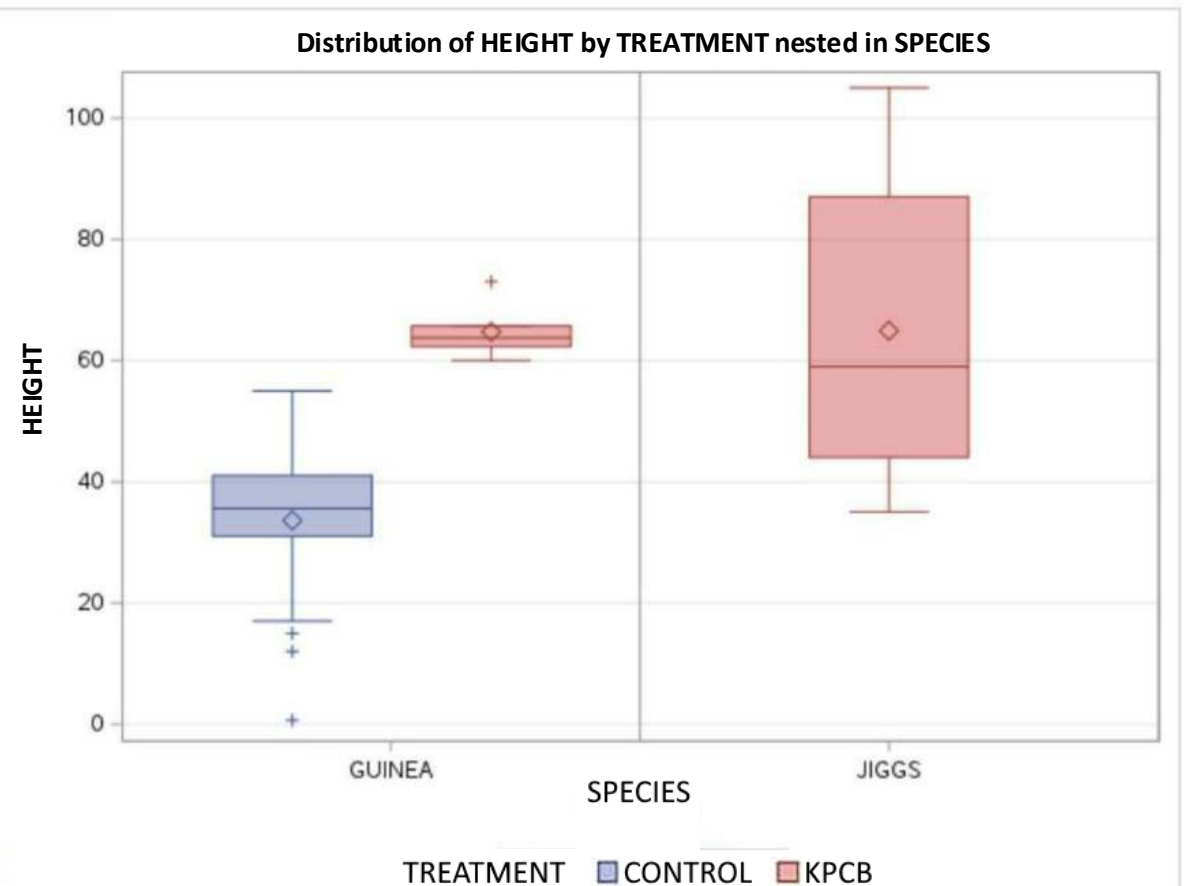
Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	14662.62371	7331.31185	26.48	<.0001
Error	57	15778.46175	276.81512		
Corrected total	59	30441.08546			

R-squared	Var. Coef.	Root MSE	Average HEIGHT
0.481672	33.78626	16.63776	49.24417

Figure a. Anova\* for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).

\*Analysis of variance

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.





# Cutting height of Buttercup (*Thitonia diversifolia*)

## Descriptive statistics

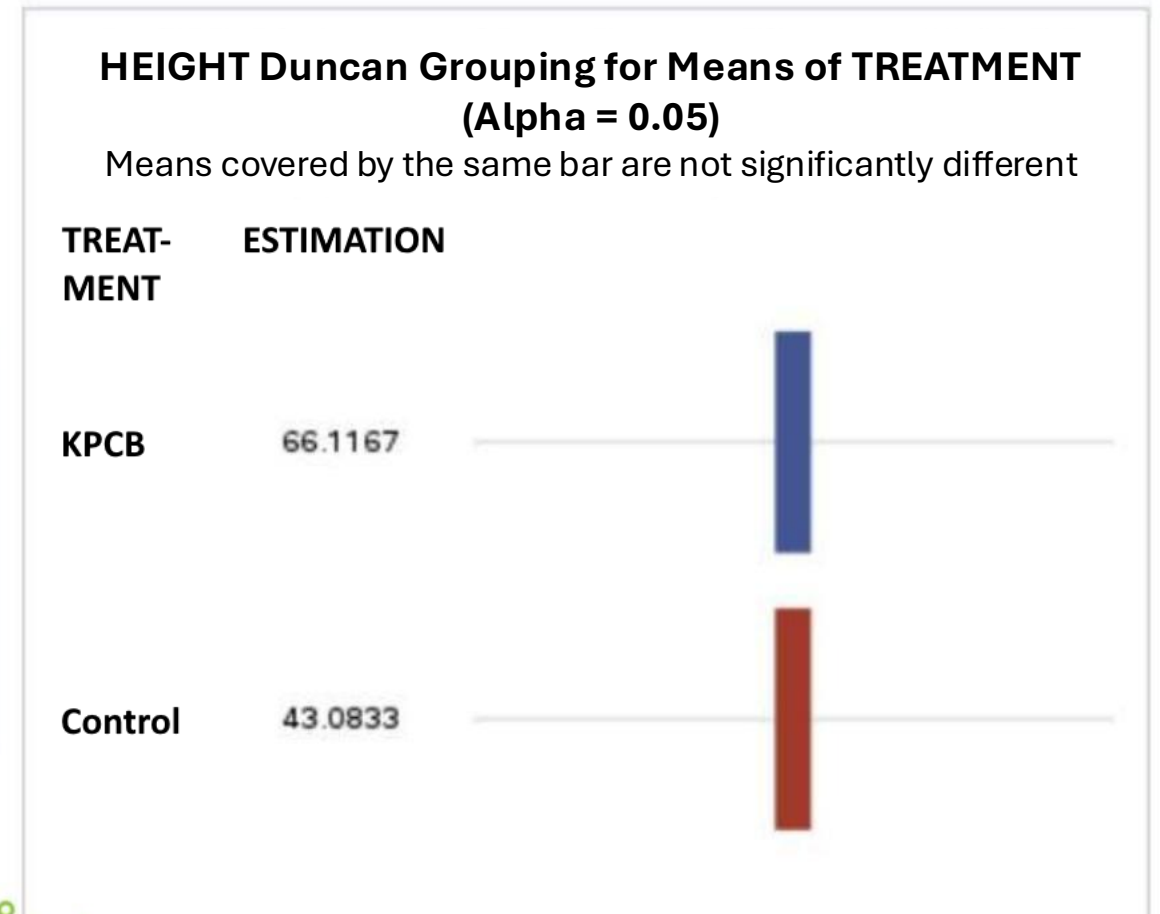
Treatment/Variable	Cutting Height (cm)
Thitonia diversifolia (Control)	43.08 ± 9.12 b
Thitonia diversifolia (KPCB)	66.11 ± 2.77a <b>(+54%)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	2122.137778	2122.137778	35.57	<.0001
Error	16	954.545000	59.659062		
Corrected total	17	3076.682778			

R-squared	Var. Coef.	Root MSE	Average HEIGHT
0.689749	15.21623	7.723928	50.76111

Figure a. Anova for the species *Thitonia diversifolia*.

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.



# Capacity (green foliage) of Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda Grass, Cynodon dactylon*)

## Descriptive statistics

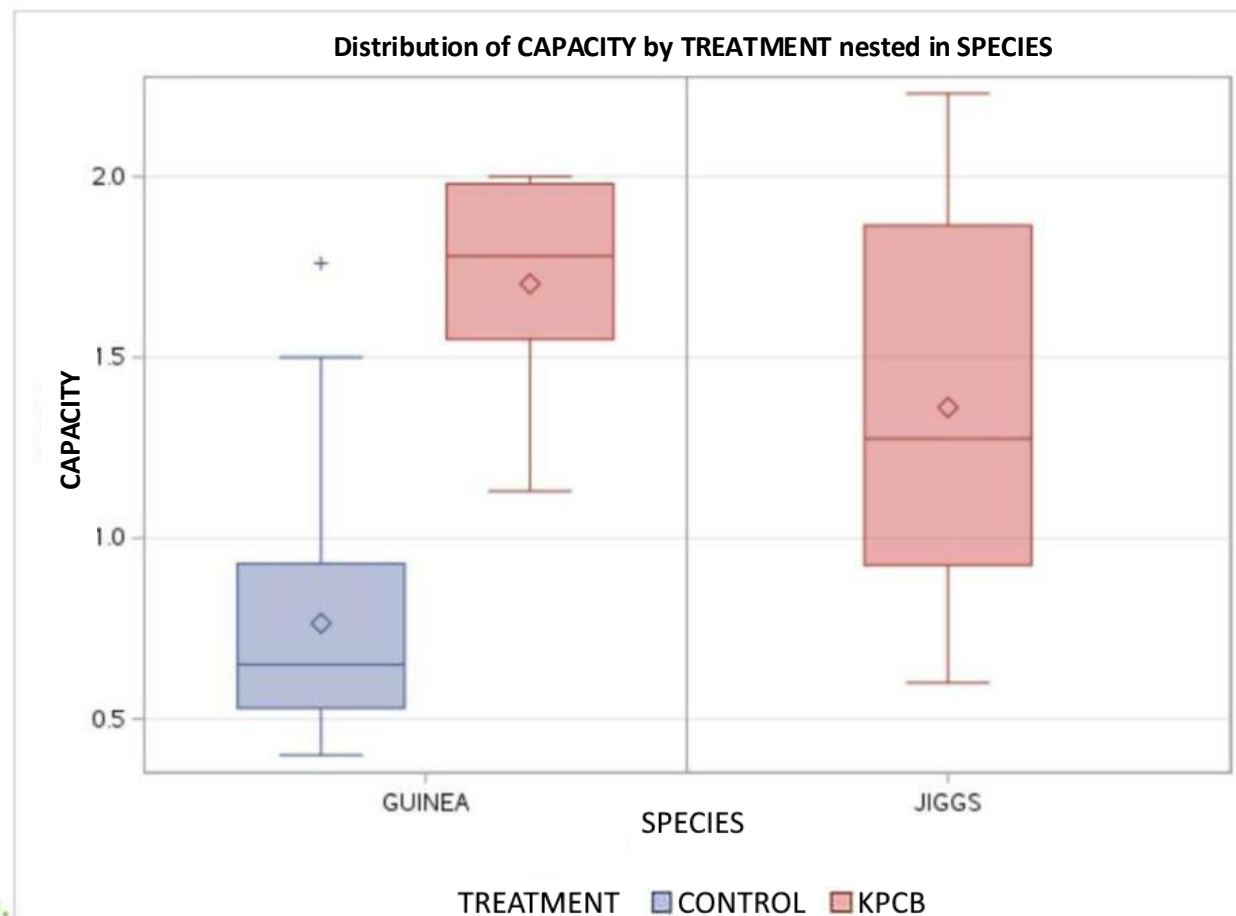
Treatment/Variable	Capacity/Green Foliage (kgFV/M <sup>2</sup> )
Megathyrsus maximus (Control)	0.76 ± 0.33bc
Megathyrsus maximus (KPCB)	1.7 ± 0.32ac <b>(+124%)</b>
Cynodon dactylon (KPCB)	1.36 ± 0.53ab

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	7.20172750	3.60086375	19.86	<.0001
Error	57	10.33733250	0.18135671		
Corrected total	59	17.53906000			

R-squared	Var. Coef.	Root MSE	Avg. CAPACITY
0.410611	38.82042	0.425860	1.097000

Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



# Capacity (green foliage) of Buttercup (*Thitonia diversifolia*)

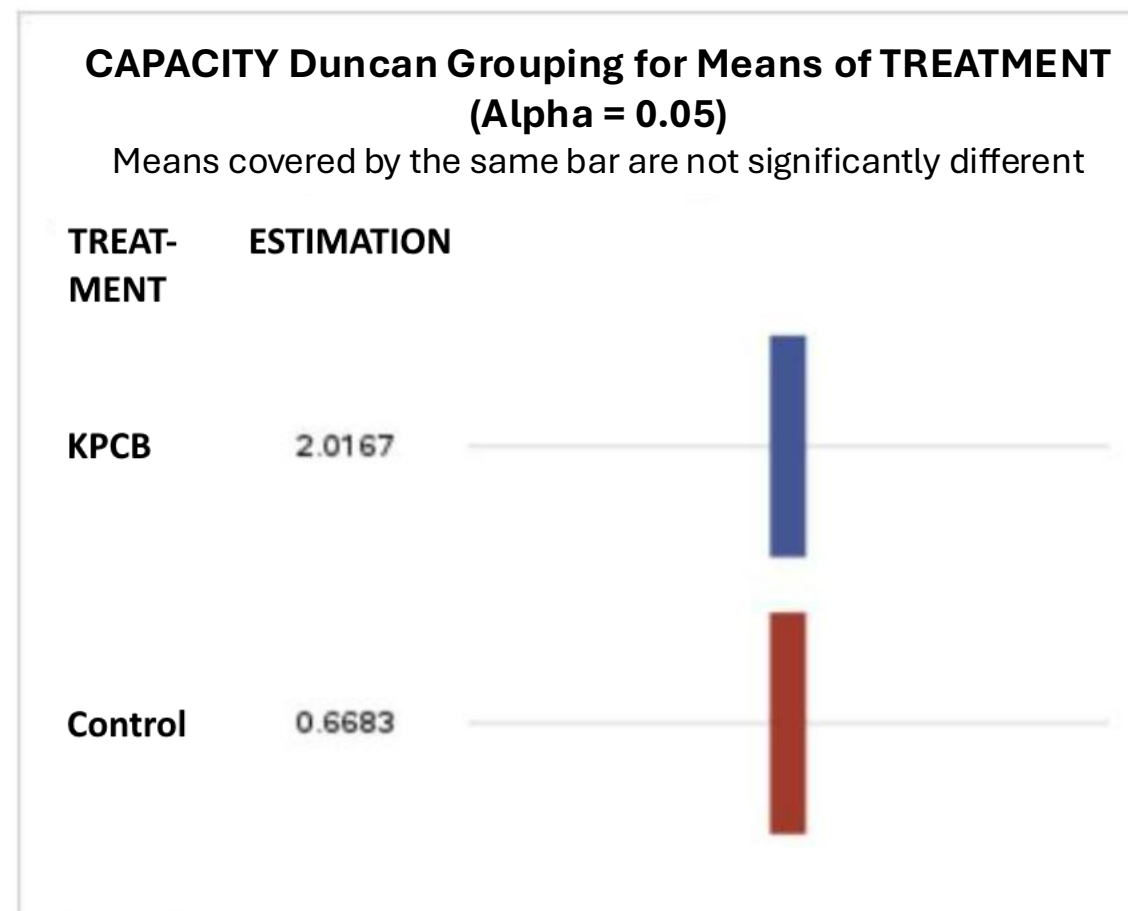
Descriptive statistics	
Treatment/Variable	Capacity/Green Foliage (kgFV/m <sup>2</sup> )
Thitonia diversifolia (Control)	0.66 ± 0.40b
Thitonia diversifolia (KPCB)	2.01 ± 0.38a <b>(+205%)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	7.27201111	7.27201111	46.33	<.0001
Error	16	2.51130000	0.15695625		
Corrected total	17	9.78331111			

R-squared	Var. Coef.	Root MSE	Avg. CAPACITY
0.743308	35.44327	0.396177	1.117778

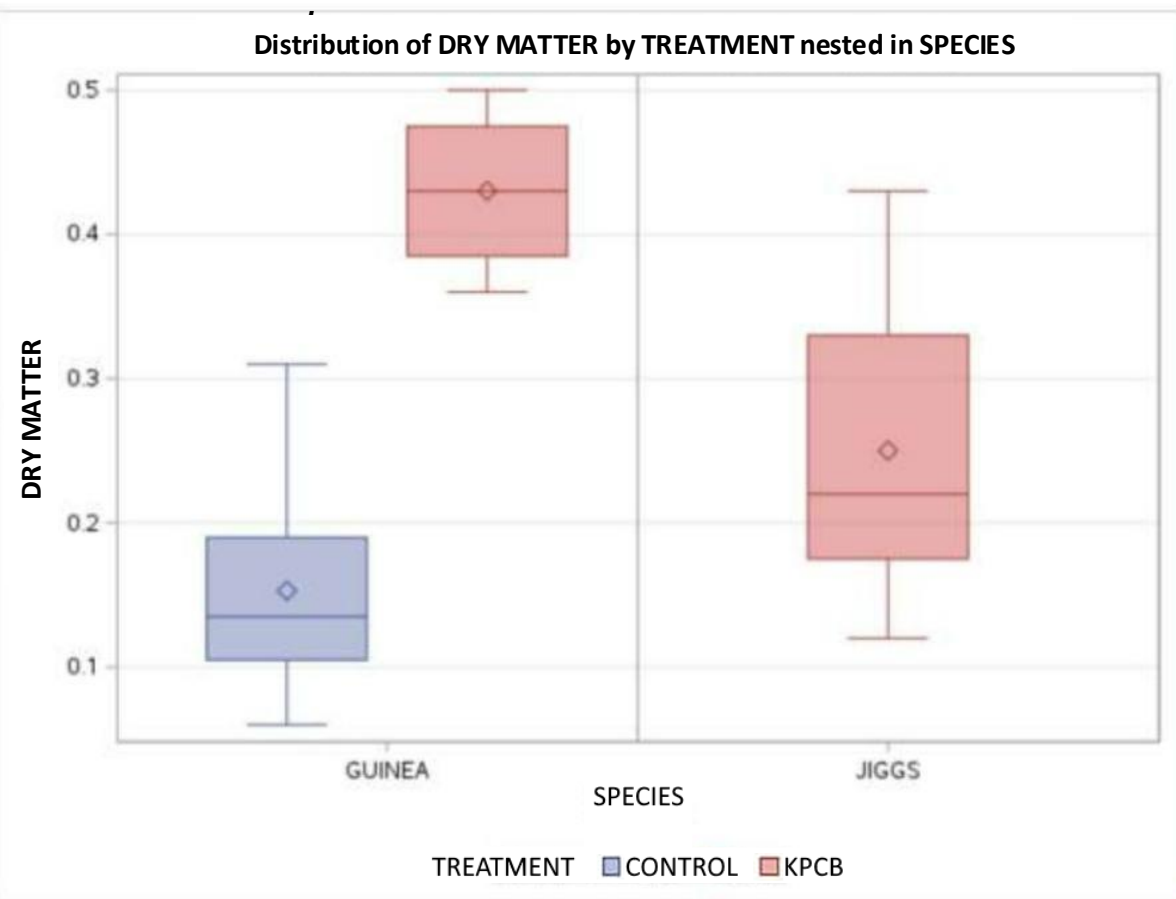
Figure a. Anova for the species *Thitonia diversifolia*.

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.



# Dry matter capacity: Guinea grass (*Megathyrus maximus*) and Jiggs (*Bermuda grass, Cynodon dactylon*)

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*) between treatments



Descriptive statistics	
Treatment/Variable	Dry Matter (kgDM/m <sup>2</sup> )
Megathyrus maximus (Control)	0.15 ± 0.53bc
Megathyrus maximus (KPCB)	0.43 ± 0.05ac <b>(+187%)</b>
Cynodon dactylon (KPCB)	0.25 ± 0.09ab

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	0.28057000	0.14028500	19.96	<.0001
Error	37	0.26002000	0.00702757		
Corrected total	39	0.54059000			

R-squared	Var. Coef.	Root MSE	Avg. DRY MATTER
0.519007	38.19161	0.083831	0.219500

Figure a. Anova for the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*).

# Dry matter capacity of Buttercup (*Thitonia diversifolia*)

## Descriptive statistics

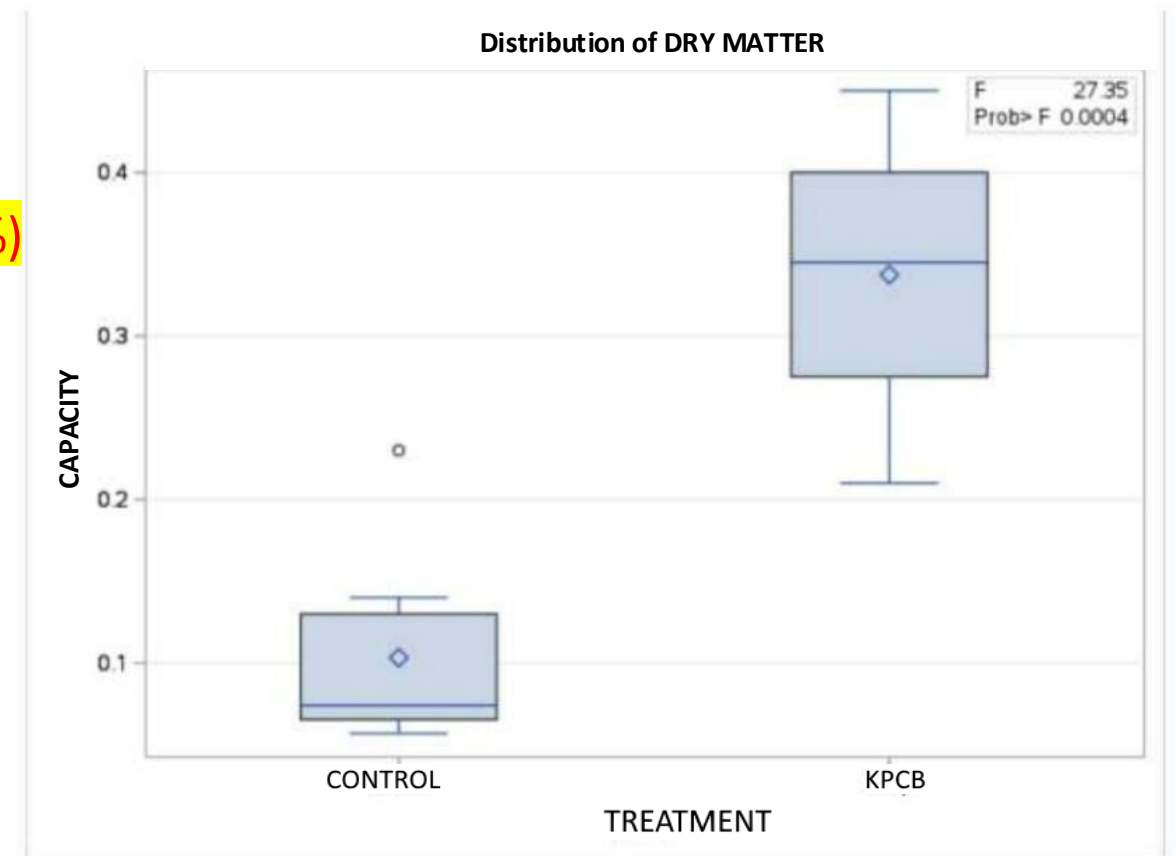
Treatment/Variable	Dry Matter (kgDM/m <sup>2</sup> )
Thitonia diversifolia (Control)	0.10 ± 0.05b
Thitonia diversifolia (KPCB)	0.33 ± 0.09a <b>(+230%)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	0.14632817	0.14632817	27.35	0.0004
Error	10	0.05350450	0.00535045		
Corrected total	11	0.19983267			

R-squared	Var. Coef.	Root MSE	Avg. DRY MATTER
0.732253	40.33829	0.073147	0.181333

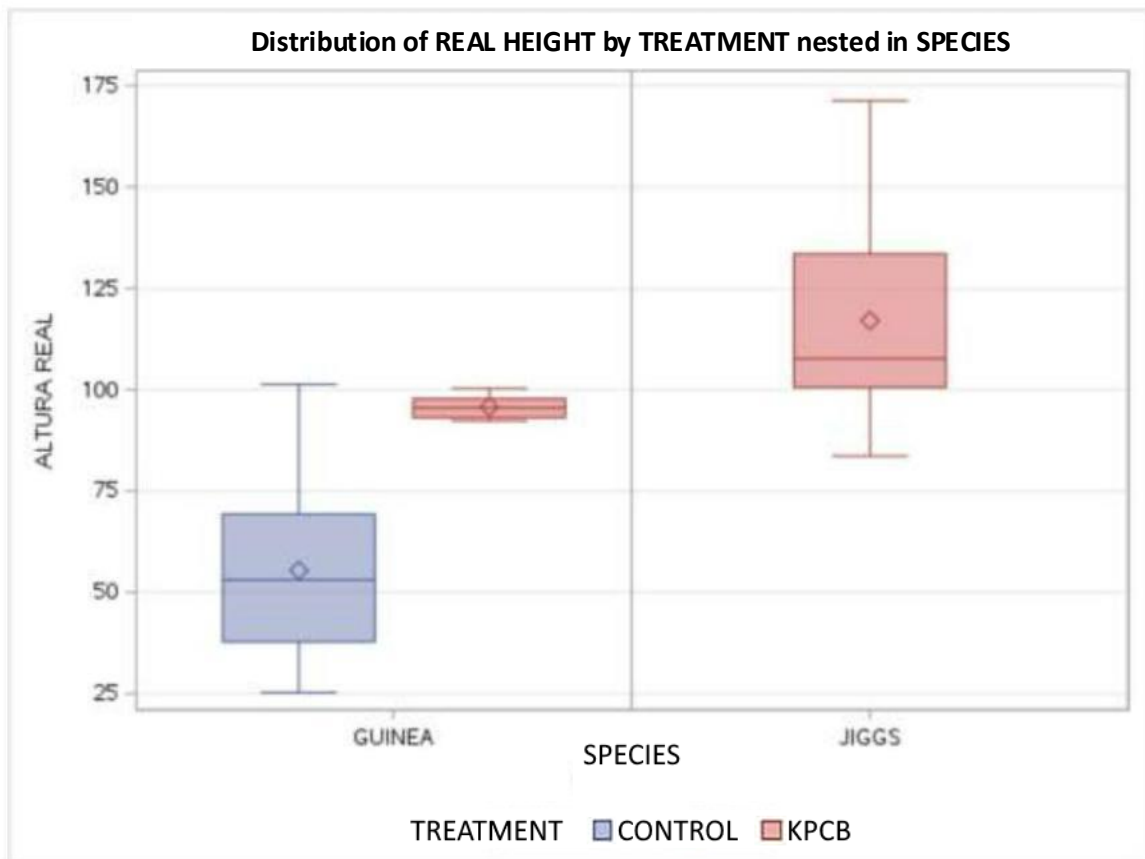
Figure a. Anova for the species *Thitonia diversifolia*.

Figure b. Tukey test for analysis of means of the *Thitonia diversifolia* species *between treatments*.



# Plant Height of Guinea grass Plant (*Megathyrus maximus*) and Jiggs (*Bermuda Grass, Cynodon dactylon*)

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



## Descriptive statistics

Treatment/Variable	Plant Height (cm)
Megathyrus maximus (Control)	55.38 ± 20.34bc
Megathyrus maximus (KPCB)	95.75 ± 2.78ac <b>(+73%)</b>
Cynodon dactylon (KPCB)	117.04 ± 22.29ab

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	103189.0768	51594.5384	126.06	<.0001
Error	117	47886.1032	409.2829		
Corrected total	119	151075.1799			

R-squared	Var. Coef.	Root MSE	Average HEIGHT
0.683031	24.06011	20.23074	84.08417

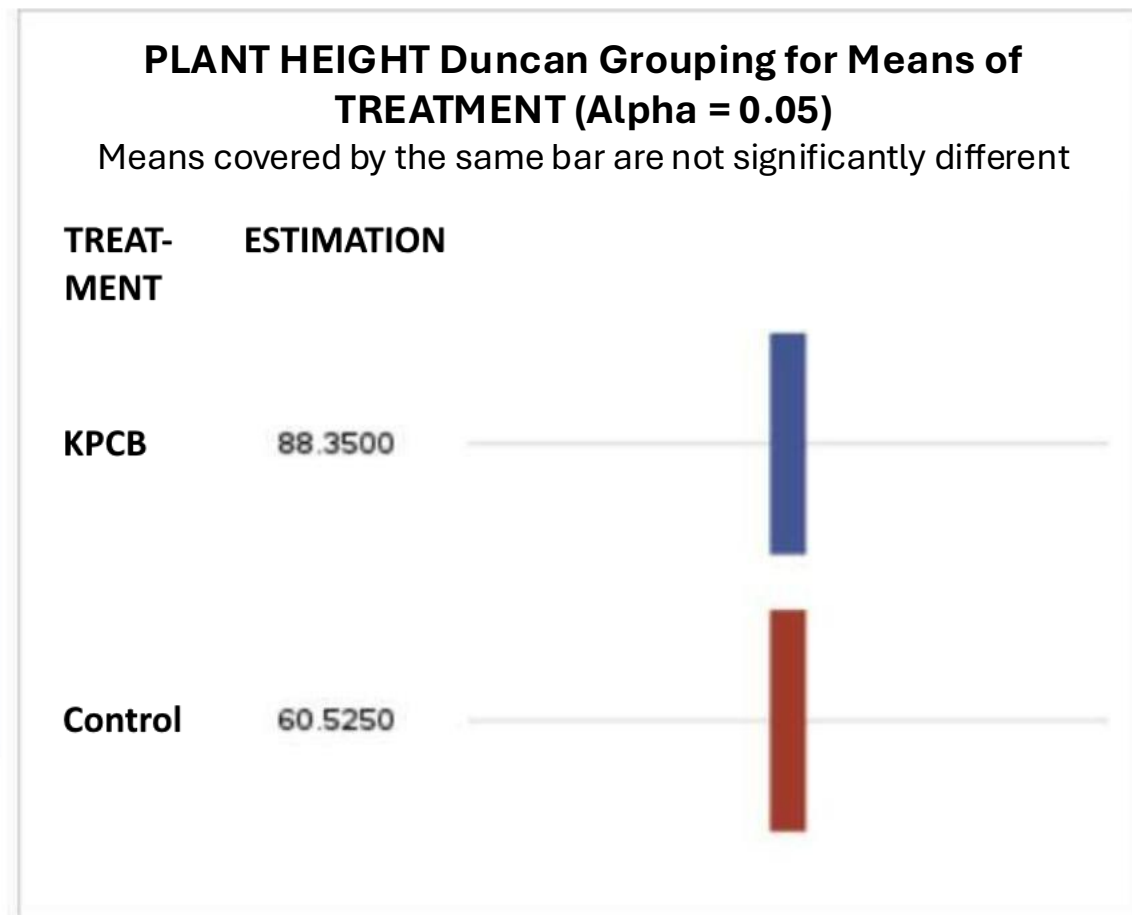
Figure a. Anova for the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*).

# Plant height of Buttercup (*Thitonia diversifolia*), cm

## Descriptive statistics

Treatment/Variable	Height of Plant/Plant Height (cm)
Thitonia diversifolia (Control)	60.52 ± 6.2b
Thitonia diversifolia (KPCB)	88.35 ± 6.9a <b>(+46%)</b>

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.



Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	6193.845000	6193.845000	149.36	<.0001
Error	34	1409.915000	41.468088		
Corrected total	35	7603.760000			

R-squared	Var. Coef.	Root MSE	Average HEIGHT
0.814577	9.225748	6.439572	69.80000

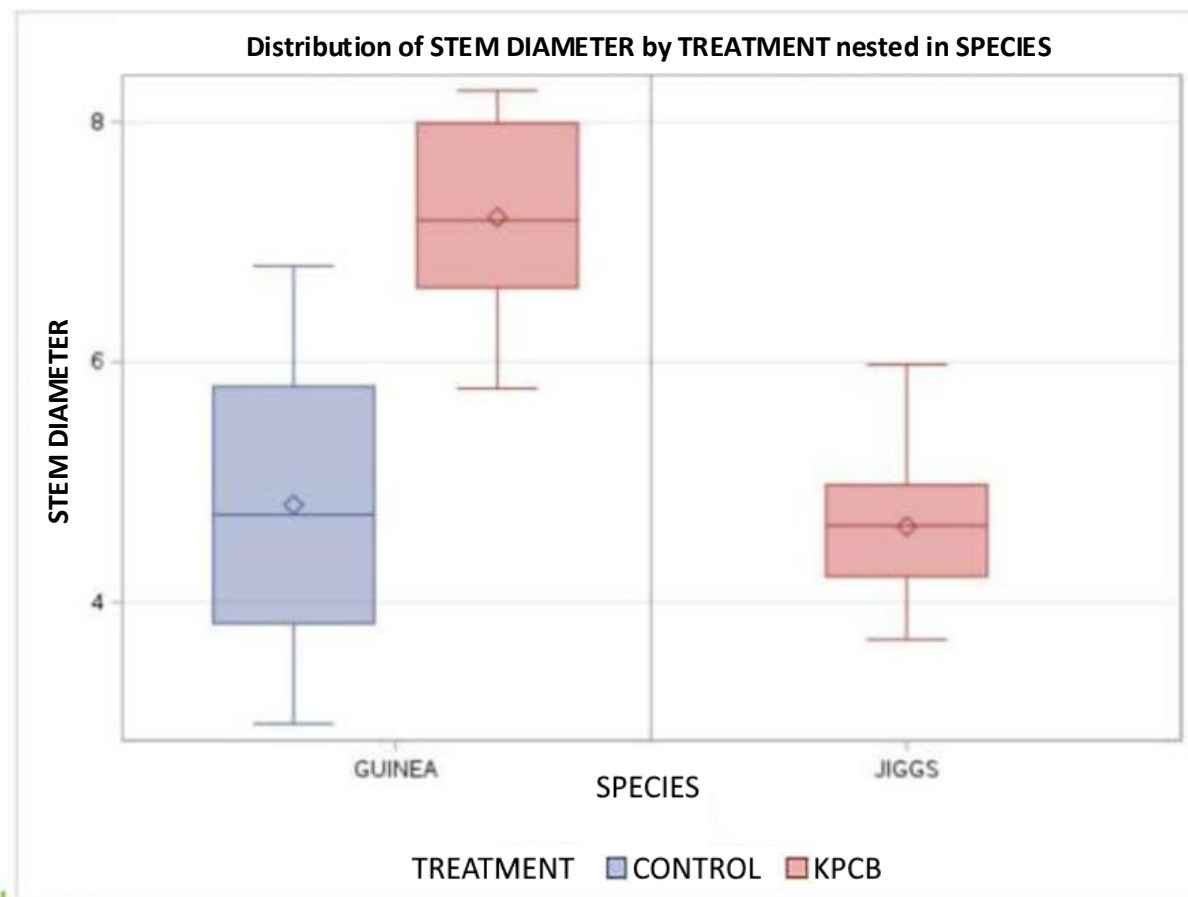
Figure a. Anova for the species *Thitonia diversifolia*.

# Stem Diameter of Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda Grass, Cynodon dactylon*)

## Descriptive statistics

Treatment/Variable	Diameter of the Stem Diameter (mm)
Megathyrsus maximus (Control)	4.8 ± 1.1b
Megathyrsus maximus (KPCB)	7.2 ± 0.818ac <b>(+50%)</b>
Cynodon dactylon (KPCB)	4.6 ± 0.46b

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments



Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	66.8768779	33.4384390	43.58	<.0001
Error	117	89.7816212	0.7673643		
Corrected total	119	156.6584992			

R-squared	Var. Coef.	Root MSE	Avg. DIAMETER
0.426896	17.59052	0.875993	4.979917

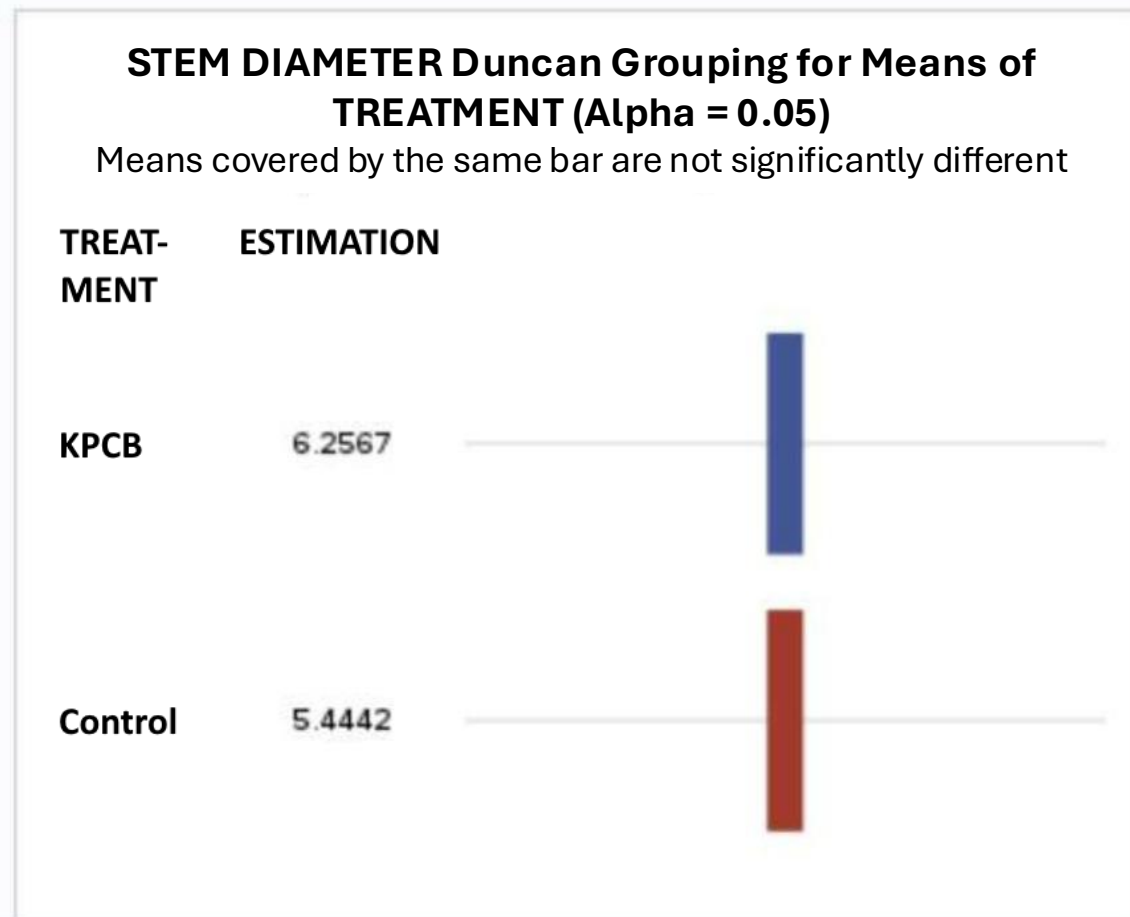
Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).



# Stem Diameter of Buttercup (*Thitonia diversifolia*), mm

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.

Descriptive statistics	
Treatment/Variable	Stem Diameter (mm)
Thitonia diversifolia (Control)	5.44 ± 0.85b
Thitonia diversifolia (KPCB)	6.25 ± 0.89a <b>(+15%)</b>



Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	5.28125000	5.28125000	7.01	0.0122
Error	34	25.60385000	0.75305441		
Corrected total	35	30.88510000			

R-squared	Var. Coef.	Root MSE	Average DIAMETER
0.170997	15.18438	0.867787	5.715000

Figure a. Anova for the species *Thitonia diversifolia*.

# Total Number of Leaves Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*)

## Descriptive statistics

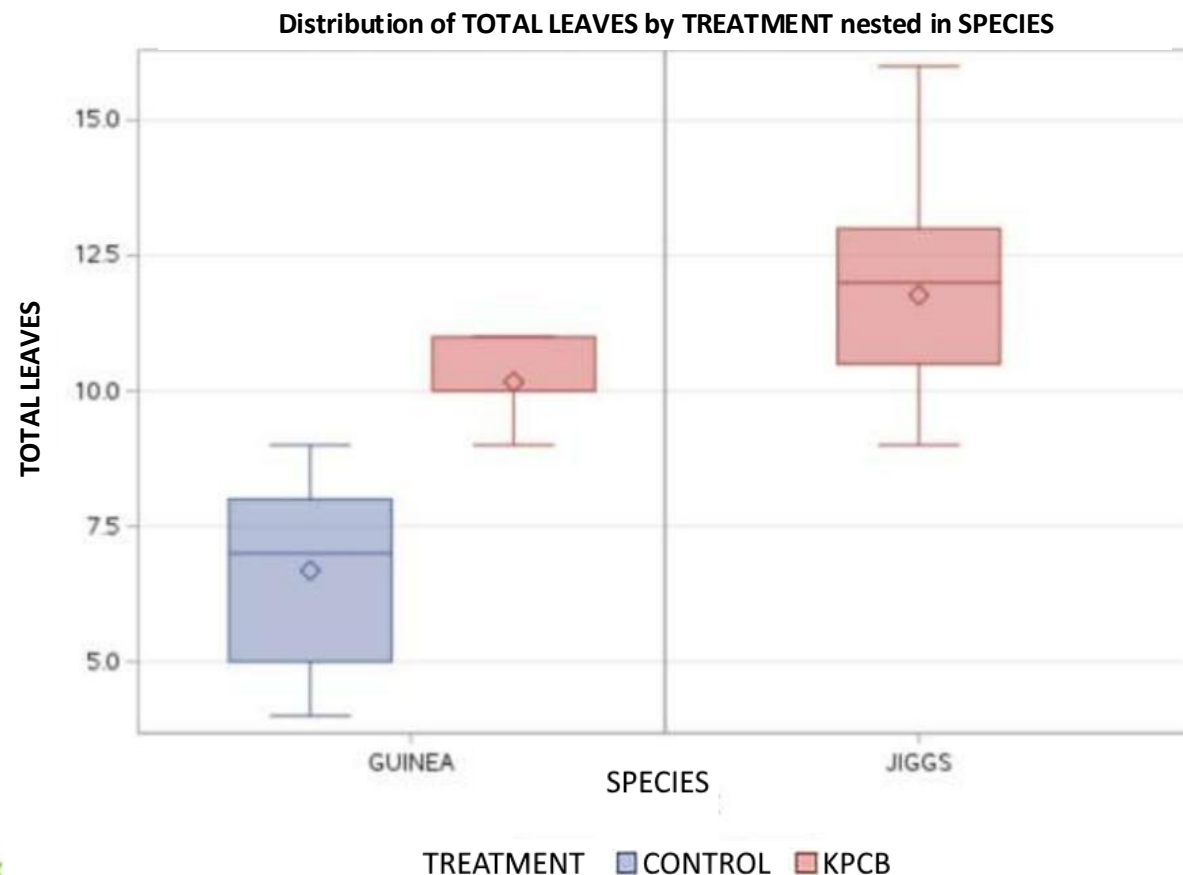
Treatment/Variable	Total No. of Leaves
Megathyrsus maximus (Control)	6.6 ± 1.57bc
Megathyrsus maximus (KPCB)	10.16 ± 0.71a <b>(+54%)</b>
Cynodon dactylon (KPCB)	11.77 ± 1.70a

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	706.3375000	353.1687500	142.91	<.0001
Error	117	289.1291667	2.4711895		
Corrected total	119	995.4666667			

R-squared	Var. Coef.	Root MSE	Avg. TOTAL LEAVES
0.709554	17.33825	1.572002	9.066667

Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



# Total Number of Leaves of Buttercup (*Thitonia diversifolia*)

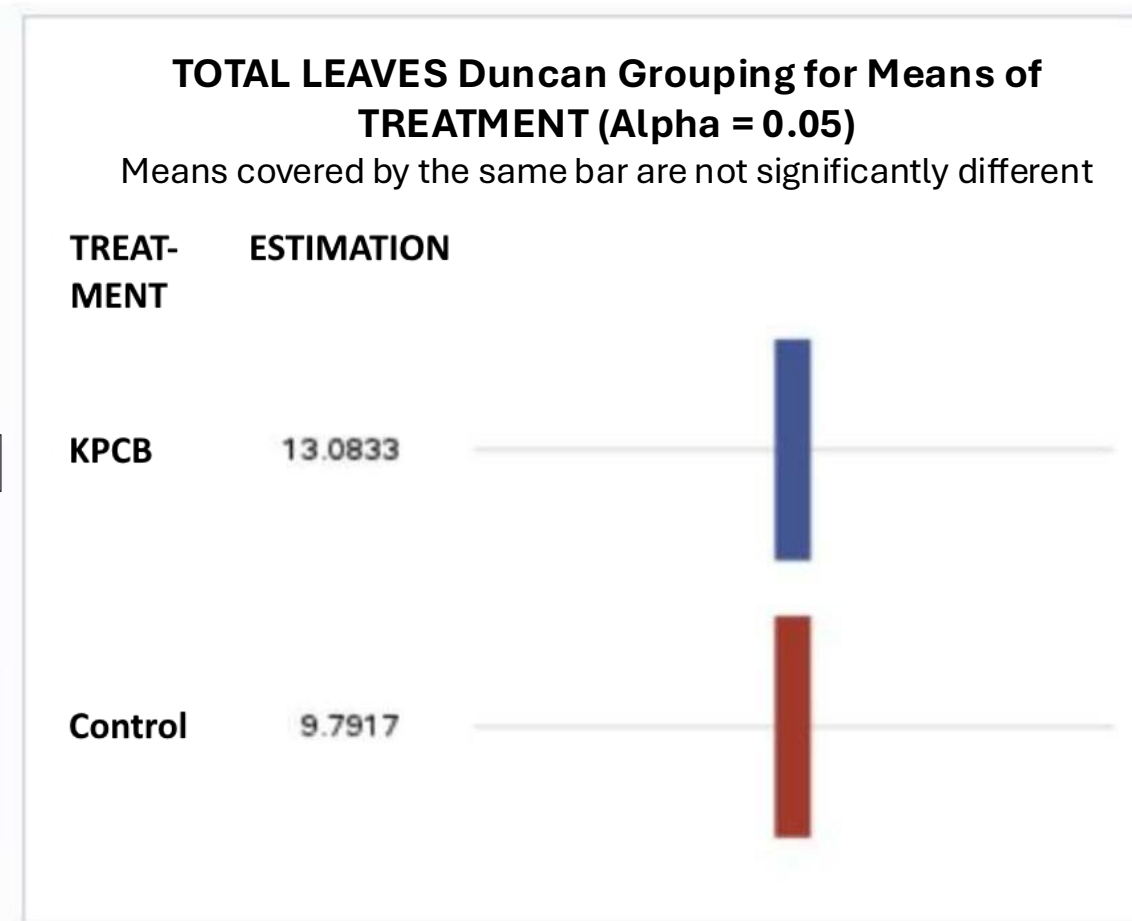
Descriptive statistics	
Treatment/Variable	Total No. of Leaves
Thitonia diversifolia (Control)	9.79 ± 0.93b
Thitonia diversifolia (KPCB)	13.08 ± 1.16a <b>(+34%)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	86.6805556	86.6805556	84.51	<.0001
Error	34	34.8750000	1.0257353		
Corrected total	35	121.5555556			

R-squared	Var. Coef.	Root MSE	Avg. TOTAL LEAVES
0.713094	9.301095	1.012786	10.88889

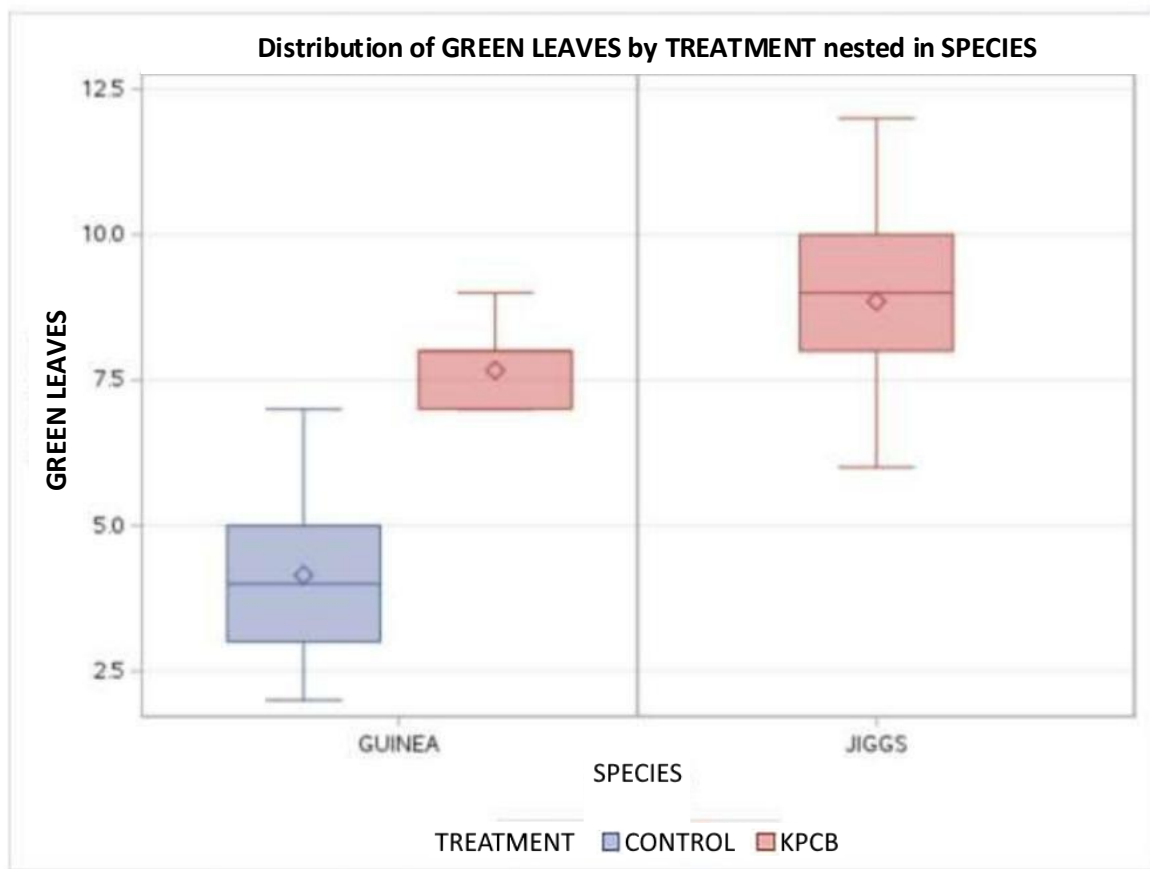
Figure a. Anova for the species *Thitonia diversifolia*.

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.



# Number of Green Leaves Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda Grass, Cynodon dactylon*)

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



### Descriptive statistics

Treatment/Variable	Number of Green Leaves
Megathyrsus maximus (Control)	4.15 ± 1.2bc
Megathyrsus maximus (KPCB)	7.66 ± 0.65ac (+85%)
Cynodon dactylon (KPCB)	8.8 ± 1.42ab

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	612.0708333	306.0354167	182.41	<.0001
Error	117	196.2958333	1.6777422		
Corrected total	119	808.3666667			

R-squared	Var. Coef.	Root MSE	Avg. GREEN LEAVES
0.757170	20.29154	1.295277	6.383333

Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).

# Number of Green Leaves of Buttercup (*Thitonia diversifolia*)

## Descriptive statistics

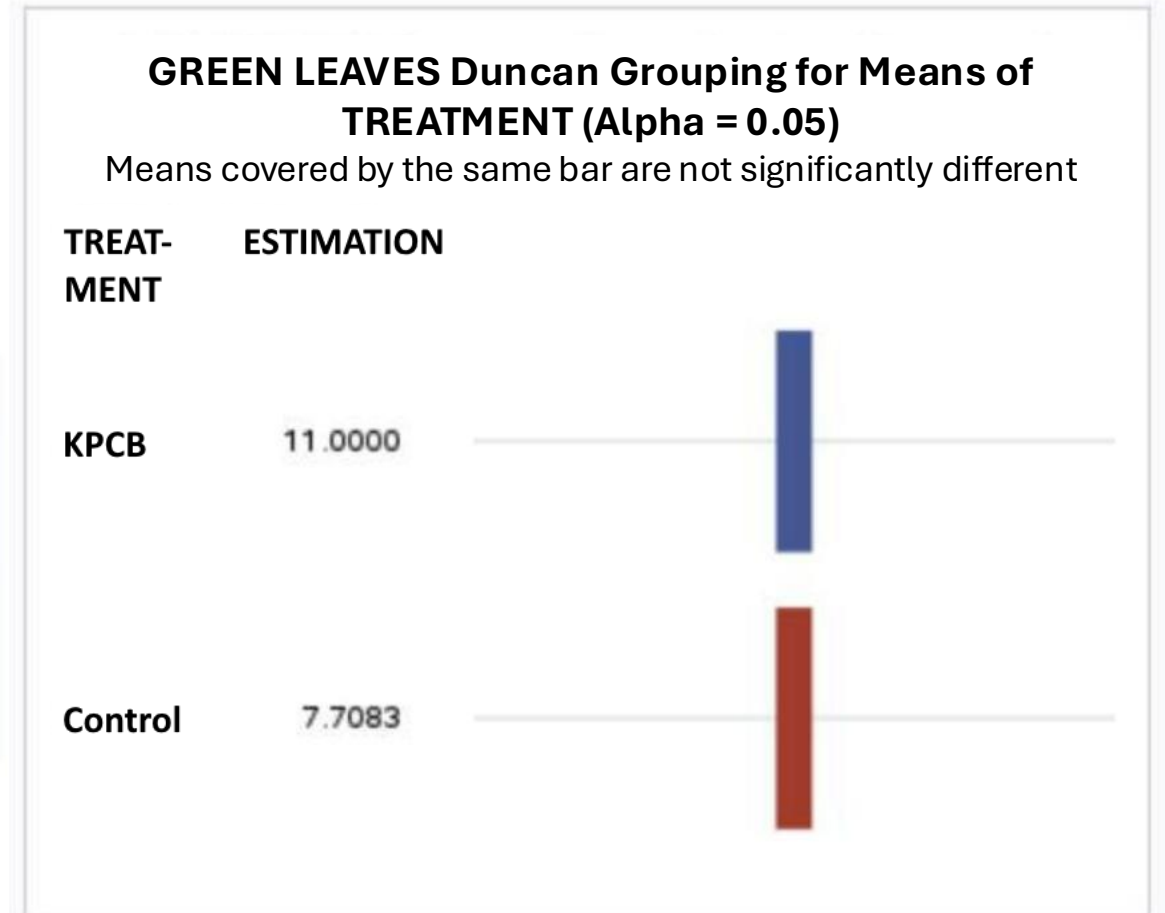
Treatment/Variable	Number of Green Leaves
Thitonia diversifolia (Control)	7.70 ± 1.04b
Thitonia diversifolia (KPCB)	11.00 ± 1.12a (+43%)

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	86.6805556	86.6805556	75.65	<.0001
Error	34	38.9583333	1.1458333		
Corrected total	35	125.6388889			

R-squared	Var. Coef.	Root MSE	Avg. GREEN LEAVES
0.689918	12.15637	1.070436	8.805556

Figure a. Anova for the species *Thitonia diversifolia*.

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.



# Number of Dry Leaves Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda Grass, Cynodon dactylon*)

## Descriptive statistics

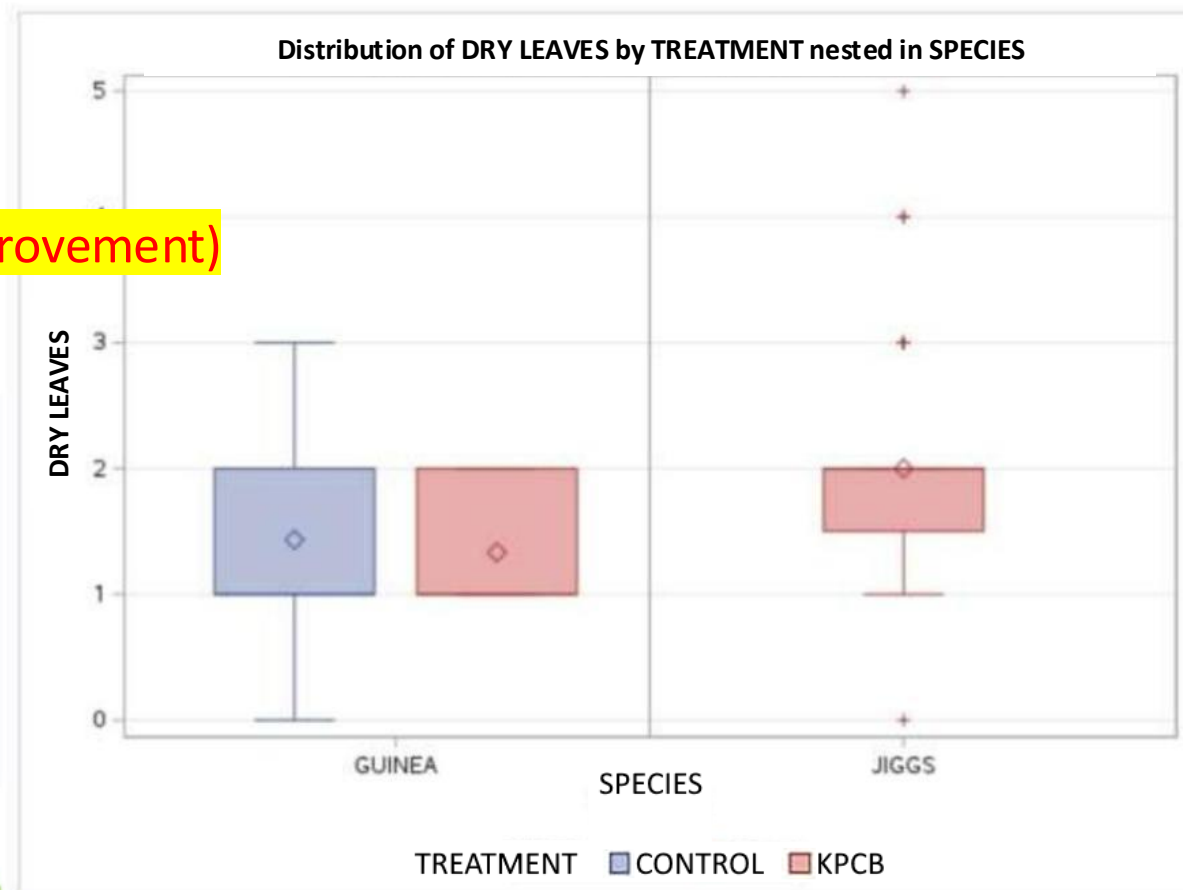
Treatment/Variable	Dry Leaves
Megathyrsus maximus (Control)	1.43 ± 0.72
Megathyrsus maximus (KPCB)	1.33 ± 0.49 <b>(7% improvement)</b>
Cynodon dactylon (KPCB)	2.00 ± 0.89

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	9.90000000	4.95000000	8.11	0.0005
Error	117	71.40000000	0.61025641		
Corrected total	119	81.30000000			

R-squared	Var. Coef.	Root MSE	Average DRY LEAVES
0.121771	47.34479	0.781189	1.650000

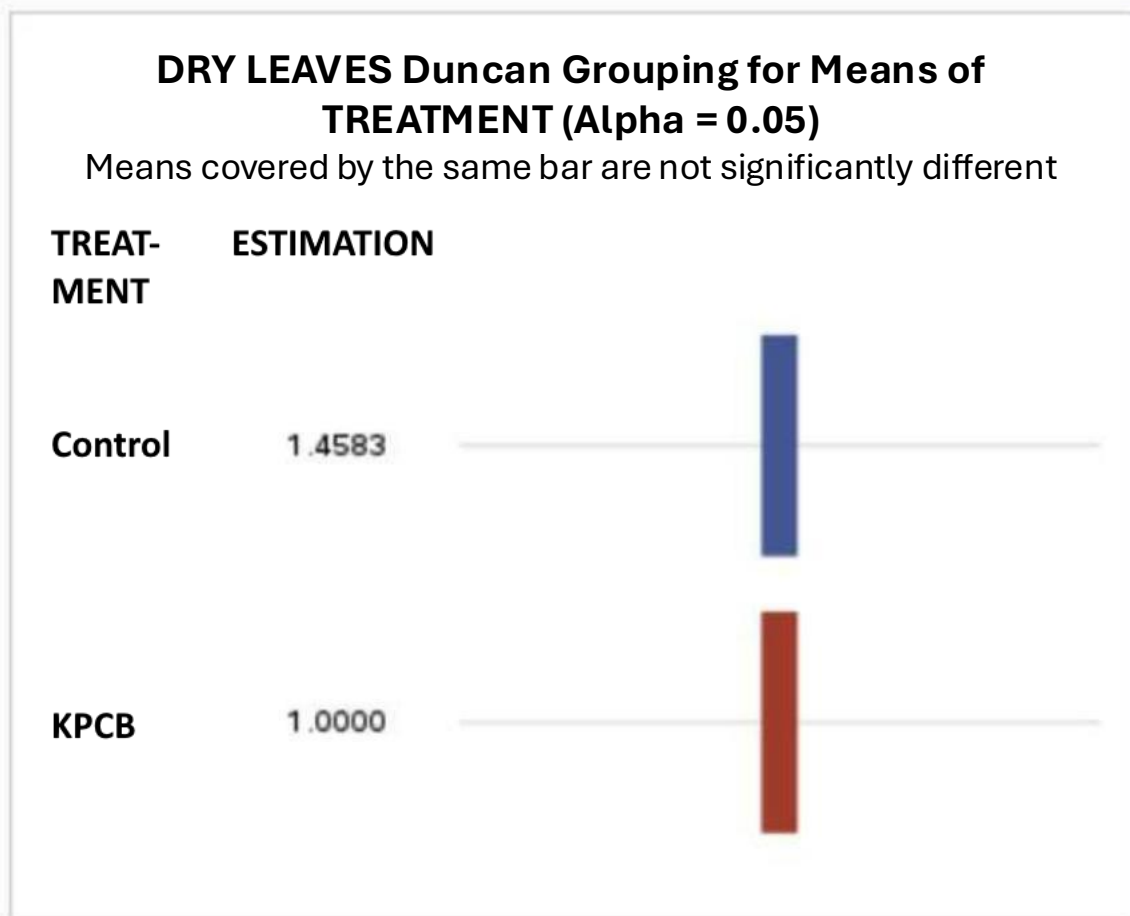
Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



# Number of Dry Leaves of Buttercup (*Thitonia diversifolia*)

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.



Descriptive statistics	
Treatment/Variable	Number of Dry Leaves
Thitonia diversifolia (Control)	1.45 ± 0.58a
Thitonia diversifolia (KPCB)	1.00 ± 0.60b <b>(31% improvement)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	1.68055556	1.68055556	4.78	0.0358
Error	34	11.95833333	0.35171569		
Corrected total	35	13.63888889			

R-squared	Var. Coef.	Root MSE	Average DRY LEAVES
0.123218	45.42558	0.593056	1.305556

Figure a. Anova for the species *Thitonia diversifolia*.

# Guinea grass Penultimate Leaf Length (*Megathyrsus maximus*) and Jiggs (*Bermuda Grass, Cynodon dactylon*)

## Descriptive statistics

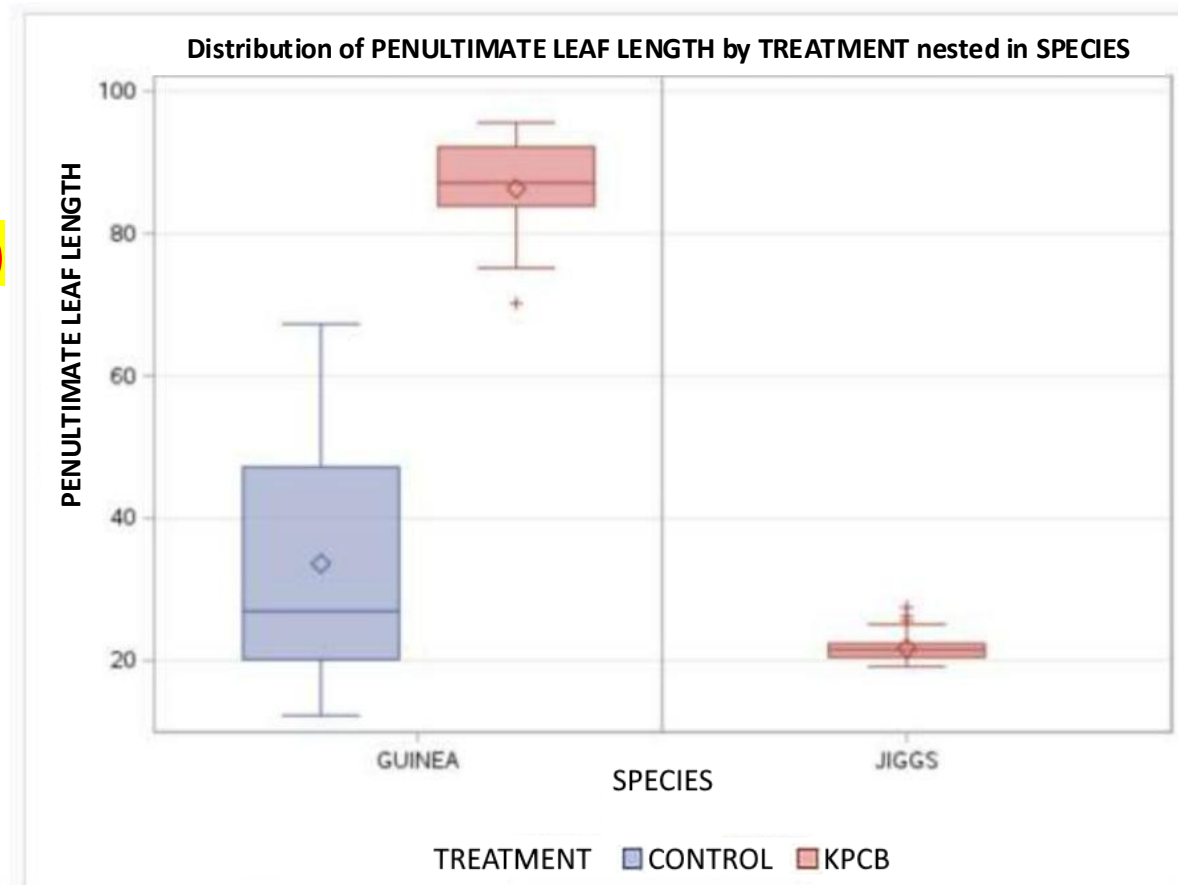
Treatment/Variable	Penultimate Leaf Length (cm)
Megathyrsus maximus (Control)	33.64 ± 16.36bc
Megathyrsus maximus (KPCB)	86.31 ± 7.54ac <b>(+157%)</b>
Cynodon dactylon (KPCB)	21.76 ± 1.82ab

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	40037.23225	20018.61612	141.25	<.0001
Error	117	16581.39767	141.72135		
Corrected total	119	56618.62992			

R-squared	Var. Coef.	Root MSE	Avg. PENLEAFLENGTH
0.707139	34.85061	11.90468	34.15917

Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).

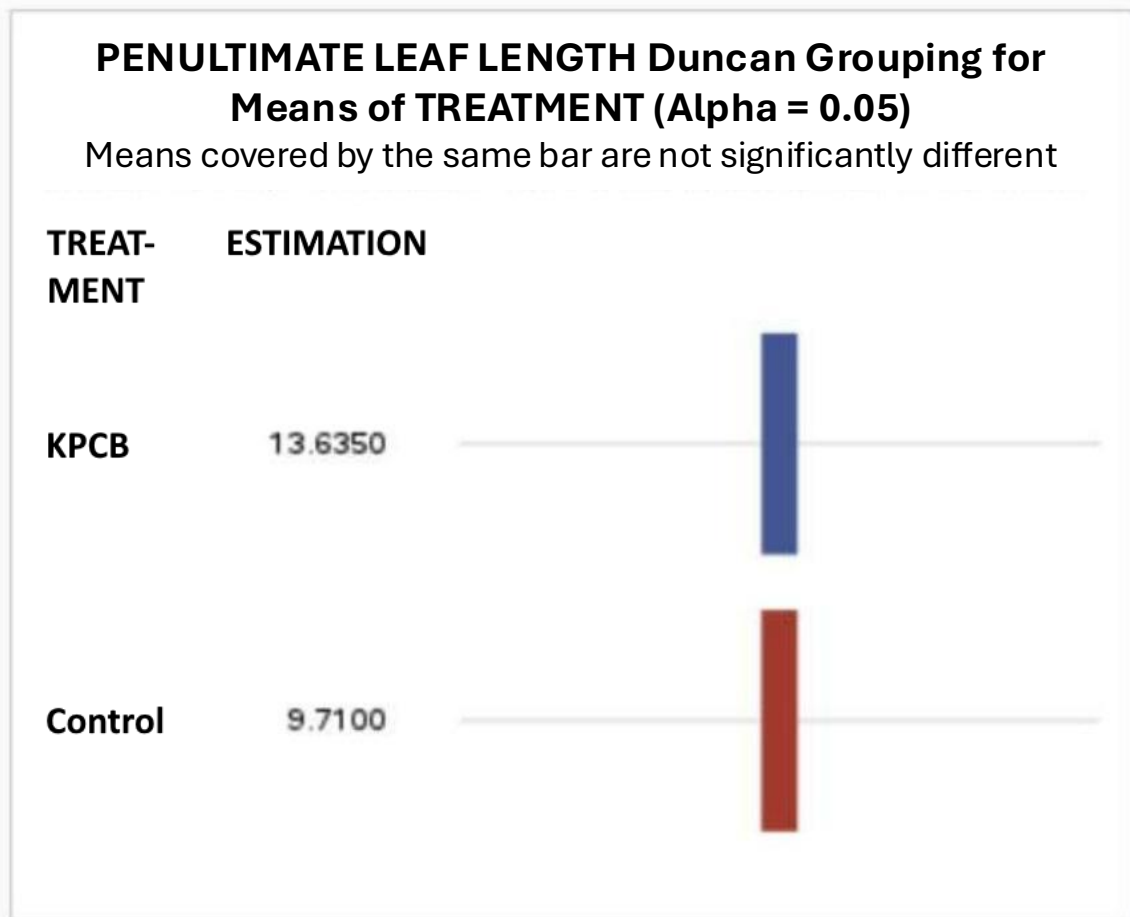
Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.





# Penultimate Leaf Length of Buttercup (*Thitonia diversifolia*)

Figure b. Duncan test for analysis of means of the *Thitonia diversifolia* species between treatments.



## Descriptive statistics

Treatment/Variable	Penultimate Leaf Length (cm)
Thitonia diversifolia (Control)	9.71 ± 0.71 <sup>a</sup>
Thitonia diversifolia (KPCB)	13.63 ± 1.10 <sup>b</sup> (+40%)

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	123.2450000	123.2450000	167.32	<.0001
Error	34	25.0439000	0.7365853		
Corrected total	35	148.2889000			

R-squared	Var. Coef.	Root MSE	Avg. PENLEAFLENGTH
0.831114	7.789250	0.858245	11.01833

Figure a. Anova for the species *Thitonia diversifolia*.

# RESULTS: NUTRITIONAL PRODUCTS



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## Dry Matter Guinea grass (*Megathyrus maximus*) and Jiggs (*Bermuda Grass, Cynodon dactylon*)

### Descriptive statistics

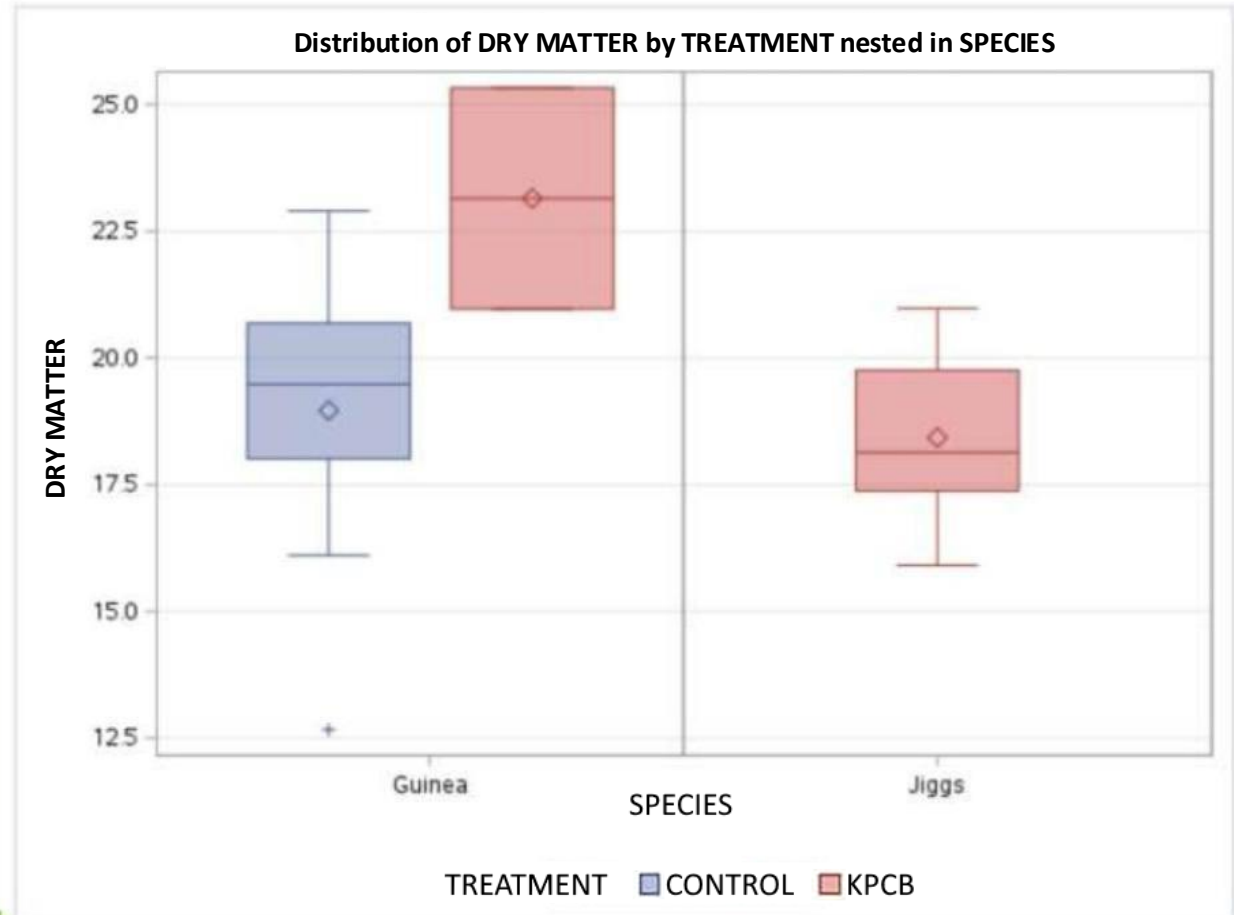
Treatment/Variable	Dry Matter (%)
Megathyrus maximus (Control)	18.96 ± 2.88b
Megathyrus maximus (KPCB)	23.14 ± 3.08ac <b>(+22%)</b>
Cynodon dactylon (KPCB)	18.42 ± 1.67b

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	36.4575617	18.2287809	2.98	0.0775
Error	17	103.8299538	6.1076443		
Corrected total	19	140.2875155			

R-squared	Var. Coef.	Root MSE	Avg. DRY MATTER
0.259877	12.89382	2.471365	19.16704

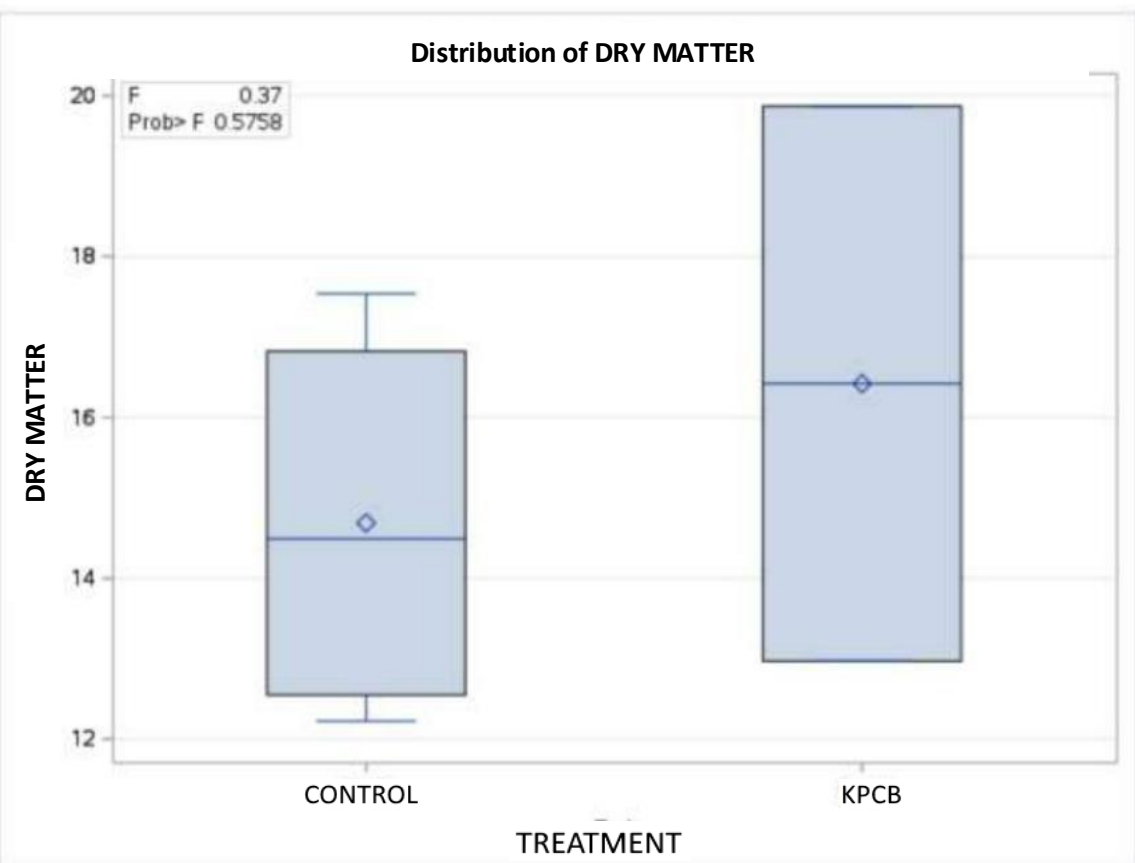
Figure a. Anova for the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*).

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



# Dry Matter of Buttercup (*Thitonia diversifolia*)

Figure b. Tukey test for analysis of means of the *Thitonia diversifolia* species between treatments.



## Descriptive statistics

Treatment/Variable	Dry Matter (%)
<i>Thitonia diversifolia</i> (Control)	14.68 ± 2.54
<i>Thitonia diversifolia</i> (KPCB)	16.42 ± 4.87 <b>(+12%)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	4.00806051	4.00806051	0.37	0.5758
Error	4	43.30986661	10.82746665		
Corrected total	5	47.31792712			

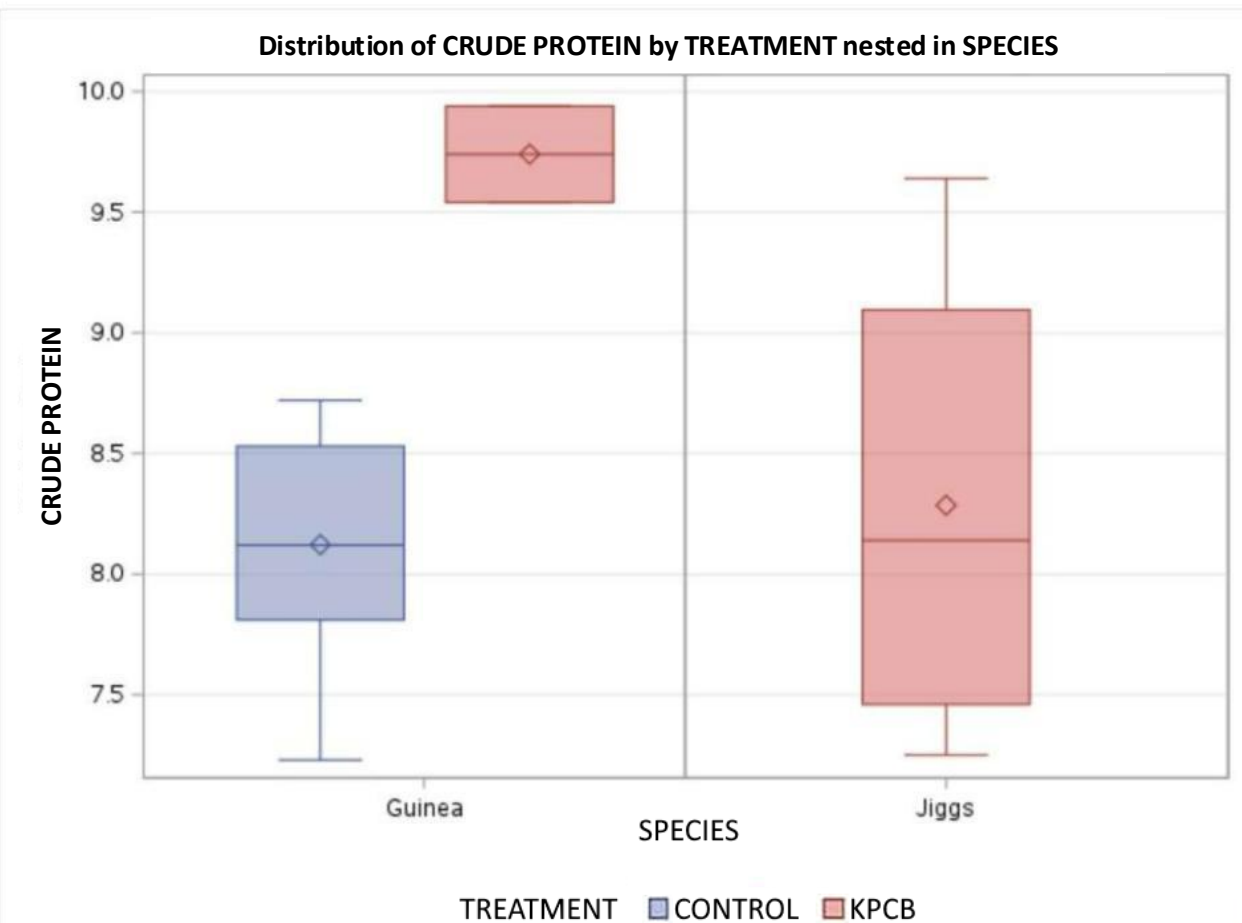
R-squared	Var. Coef.	Root MSE	Avg. DRY MATTER
0.084705	21.55714	3.290512	15.26414

Figure a. Anova for the species *Thitonia diversifolia*.

# Crude Protein Guinea grass (*Megathyrus maximus*) and Jiggs (*Bermuda grass, Cynodon dactylon*)

Descriptive statistics

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



Treatment/Variable	Crude Protein (%)
Megathyrus maximus (Control)	8.12 ± 0.47b
Megathyrus maximus (KPCB)	9.74 ± 0.28ac <b>(+20%)</b>
Cynodon dactylon (KPCB)	8.12 ± 0.95b

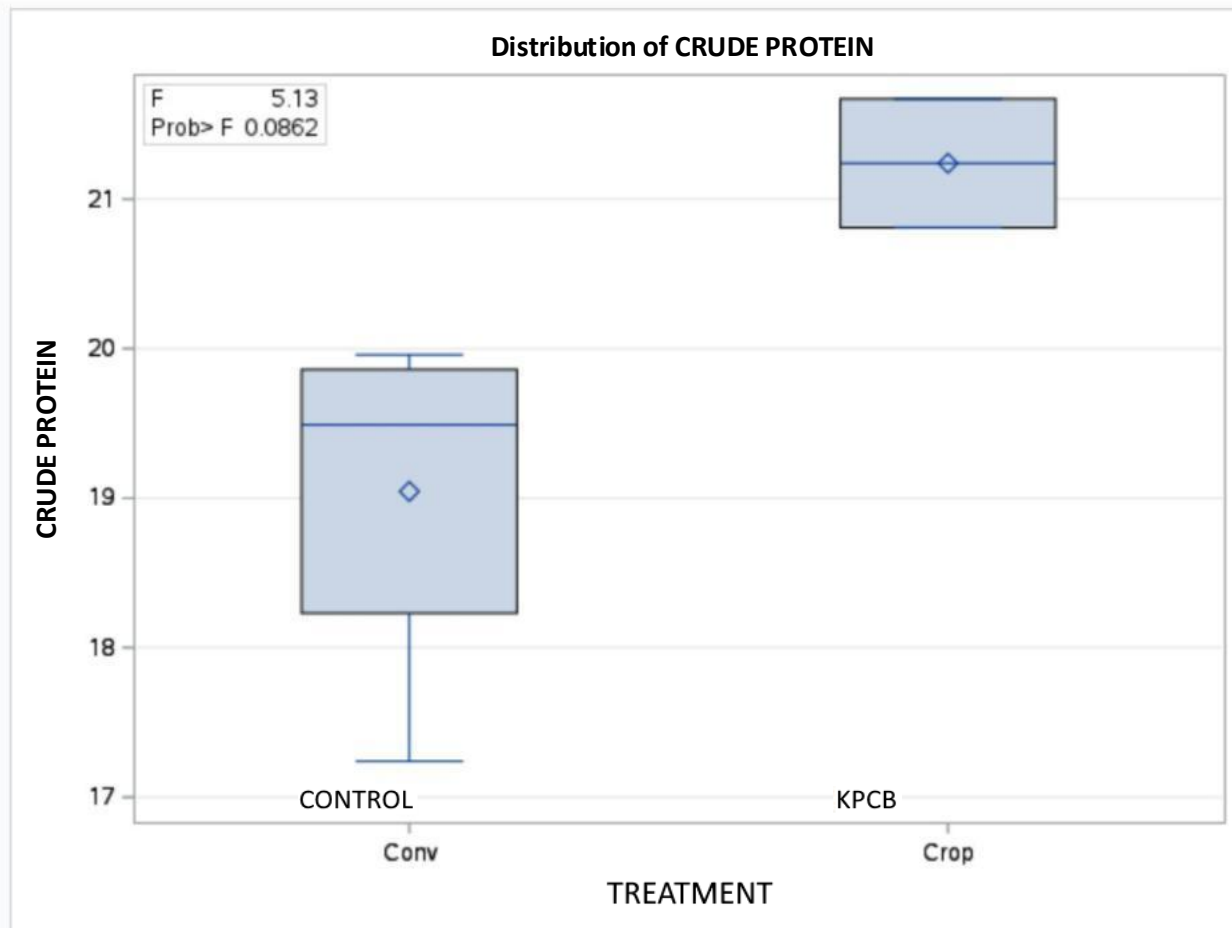
Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	4.41782000	2.20891000	4.40	0.0289
Error	17	8.53676000	0.50216235		
Corrected total	19	12.95458000			

R-squared	Var. Coef.	Root MSE	Average CRUDE PROTEIN
0.341024	8.487653	0.708634	8.349000

Figure a. Anova for the species Guinea grass (*Megathyrus maximus*) and Jiggs (*Cynodon dactylon*).

# Crude Protein of Buttercup (*Thitonia diversifolia*)

Figure b. Duncan test for analysis of means of the *Thitonia diversifolia* species between treatments.



## Descriptive statistics

Treatment/Variable	Crude Protein (%)
Thitonia diversifolia (Control)	19.04 ± 1.24
Thitonia diversifolia (KPCB)	21.24 ± 0.60 <b>(+12%)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	6.42403333	6.42403333	5.13	0.0862
Error	4	5.00690000	1.25172500		
Corrected total	5	11.43093333			

R-squared	Var. Coef.	Root MSE	Avg. CRUDE PROTEIN
0.561987	5.657198	1.118805	19.77667

Figure a. Anova for the species *Thitonia diversifolia*.

# Ash of Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda grass, Cynodon dactylon*)

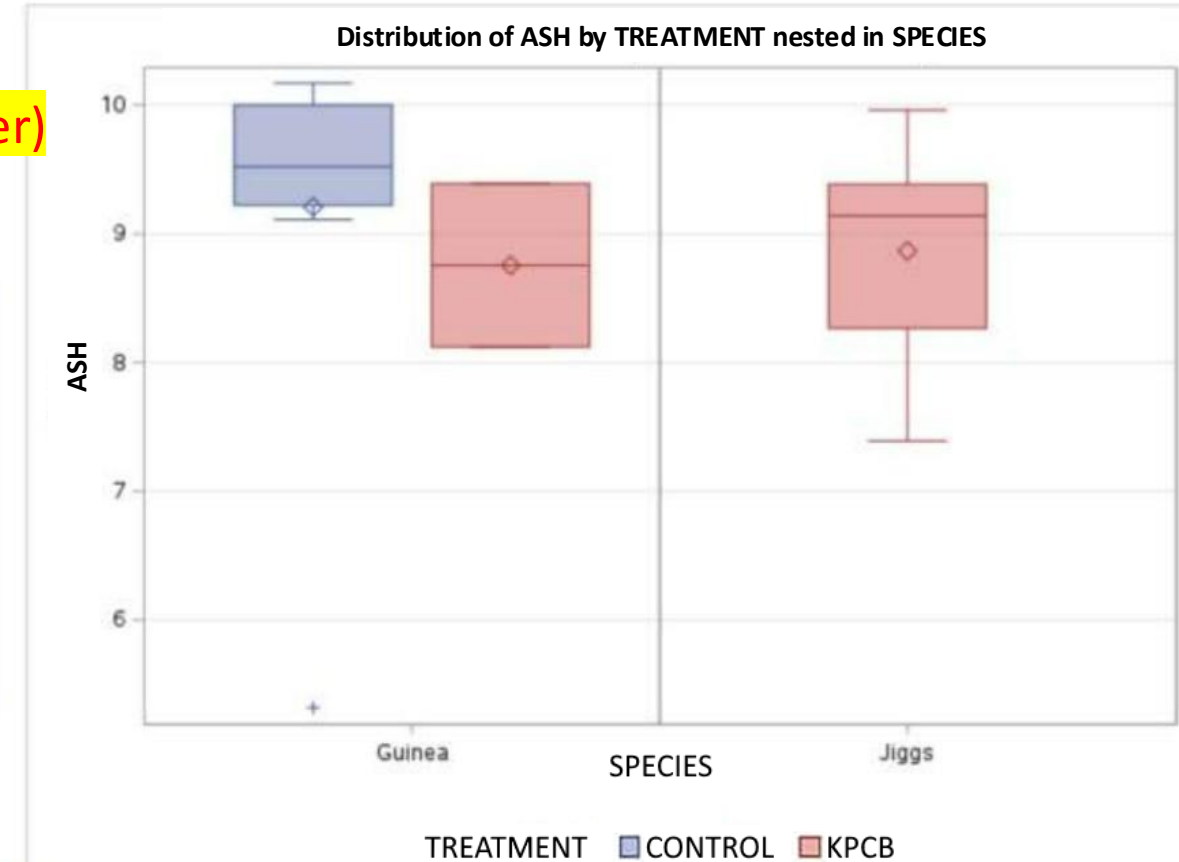
Descriptive statistics	
Treatment/Variable	Ash ( % )
Megathyrsus maximus (Control)	9.20 ± 1.42bc
Megathyrsus maximus (KPCB)	8.75 ± 0.89a <b>(5% better)</b>
Cynodon dactylon (KPCB)	8.86 ± 0.92a

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	0.68592750	0.34296375	0.23	0.7943
Error	17	24.98232750	1.46954868		
Corrected total	19	25.66825500			

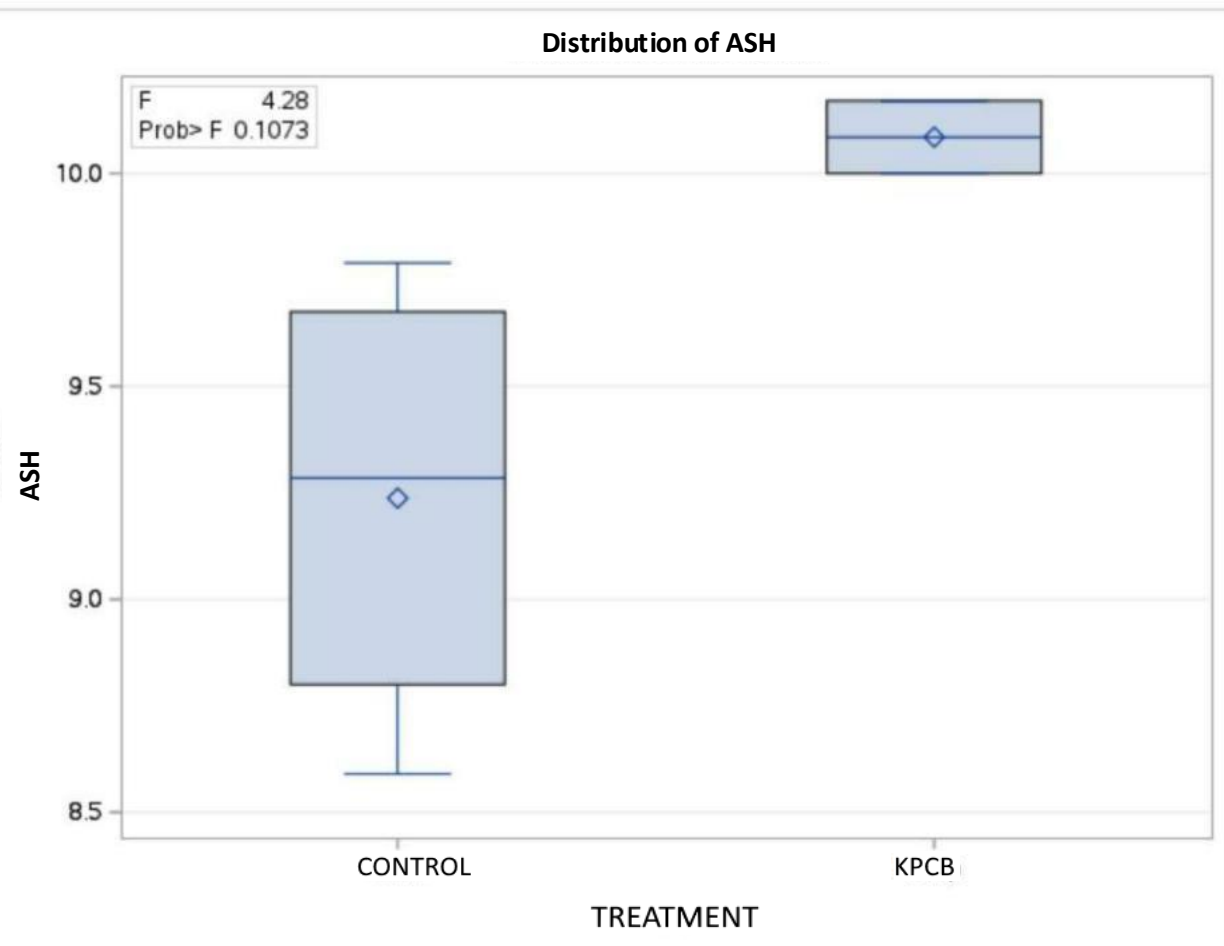
R-squared	Var. Coef.	Root MSE	Average ASH
0.026723	13.42989	1.212249	9.026500

Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).



# Ash of Buttercup (*Thitonia diversifolia*)

Figure b. Duncan test for analysis of means of the *Thitonia diversifolia* species *between treatments*.



## Descriptive statistics

Treatment/Variable	Ash (%)
<i>Thitonia diversifolia</i> (Control)	9.23 ± 0.54
<i>Thitonia diversifolia</i> (KPCB)	10.08 ± 0.12 (+9%*)

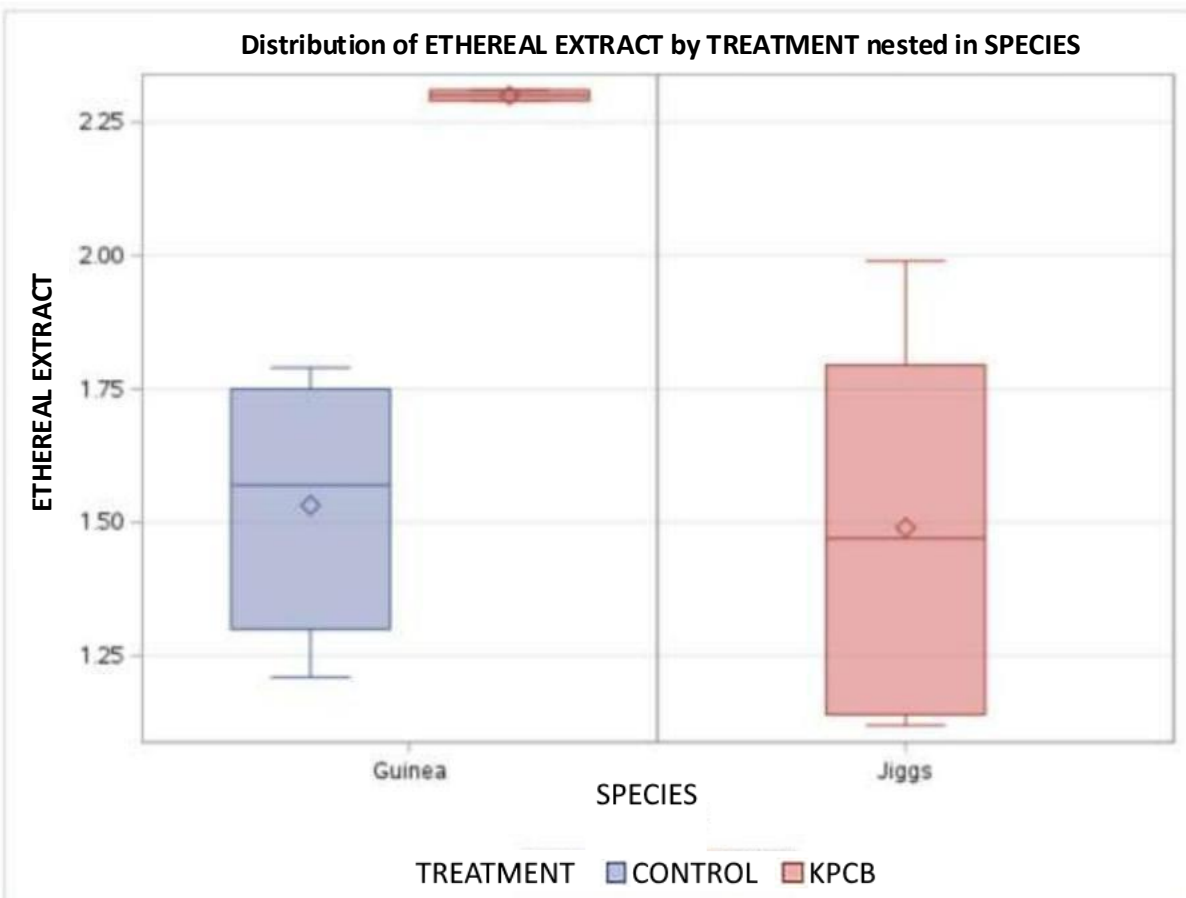
Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	0.95767500	0.95767500	4.28	0.1073
Error	4	0.89472500	0.22368125		
Corrected total	5	1.85240000			

R-squared	Var. Coef.	Root MSE	Average ASH
0.516991	4.967957	0.472950	9.520000

Figure a. Anova for the species *Thitonia diversifolia*.

# Ethereal Extract (crude fat) of Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda grass, Cynodon dactylon*)

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



## Descriptive statistics

Treatment/Variable	Ethereal Extract (%)
Megathyrsus maximus (Control)	1.53 ± 0.23b
Megathyrsus maximus (KPCB)	2.3 ± 0.014ac <b>(+50%)</b>
Cynodon dactylon (KPCB)	1.49 ± 0.34b

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	1.12176000	0.56088000	7.12	0.0057
Error	17	1.33916000	0.07877412		
Corrected total	19	2.46092000			

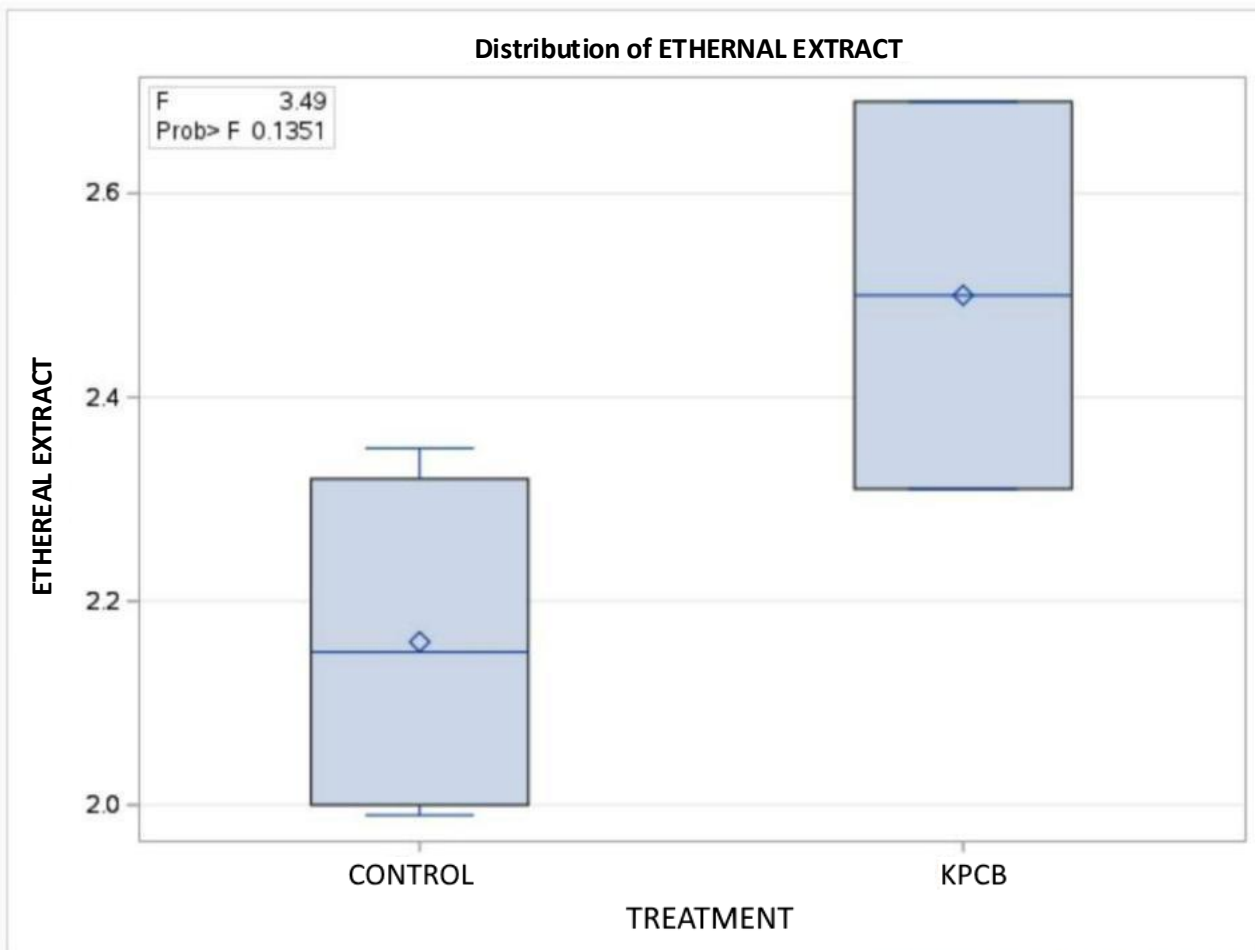
R-squared	Var. Coef.	Root MSE	Avg. ETHEREAL EXTRACT
0.455830	17.62985	0.280667	1.592000

Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).



# Ethereal Extract (crude fat) of Buttercup (*Thitonia diversifolia*)

Figure b. Duncan test for analysis of means of the species *Thitonia diversifolia* between treatments.



Descriptive statistics	
Treatment/Variable	Ethereal Extract (%)
<i>Thitonia diversifolia</i> (Control)	2.16 ± 0.18
<i>Thitonia diversifolia</i> (KPCB)	2.50 ± 0.26 (+16%)

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	0.15413333	0.15413333	3.49	0.1351
Error	4	0.17660000	0.04415000		
Corrected total	5	0.33073333			

R-squared	Var. Coef.	Root MSE	Avg.ETHERAL EXTRACT
0.466035	9.242772	0.210119	2.273333

Figure a. Anova for the species *Thitonia diversifolia*.

# Crude Fiber Guinea grass (*Megathyrsus maximus*) and Jiggs (*Bermuda grass, Cynodon dactylon*)

## Descriptive statistics

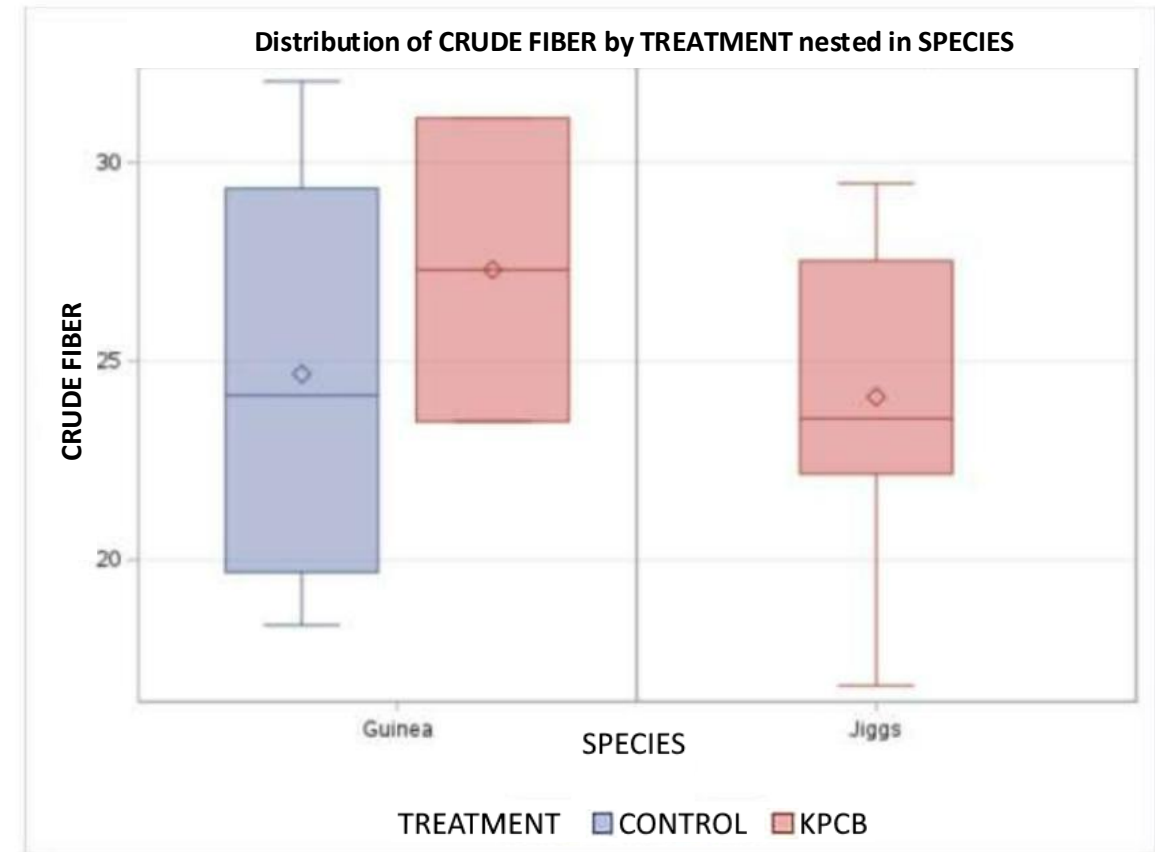
Treatment/Variable	Crude Fiber (%)
Megathyrsus maximus (Control)	24.67 ± 5.18
Megathyrsus maximus (KPCB)	27.30 ± 5.40 <b>(+11%)</b>
Cynodon dactylon (KPCB)	24.09 ± 4.13

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	2	16.4160225	8.2080113	0.36	0.7050
Error	17	391.0956975	23.0056293		
Corrected total	19	407.5117200			

R-squared	Var. Coef.	Root MSE	Avg. CRUDE FIBER
0.040284	19.41241	4.796418	24.70800

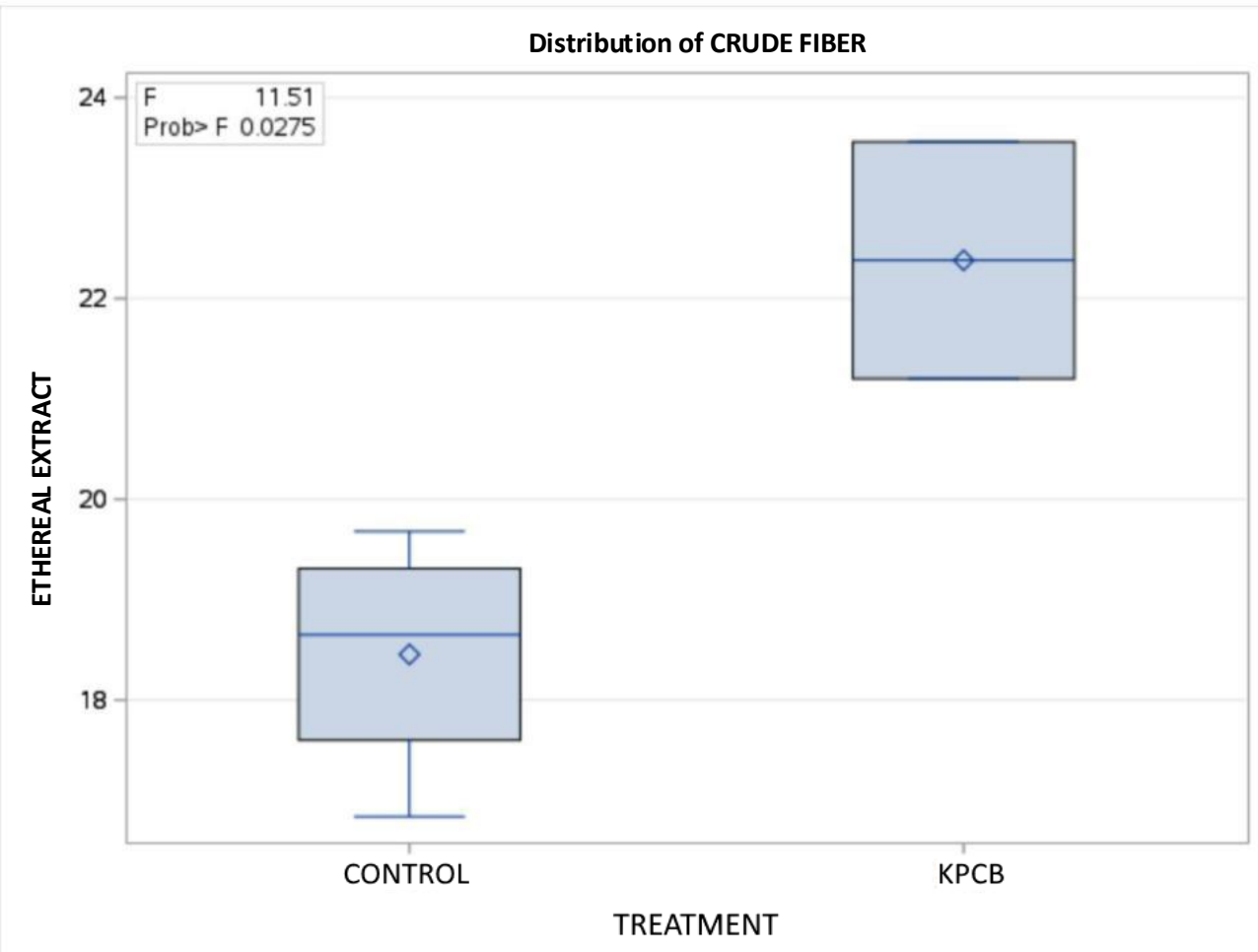
Figure a. Anova for the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*).

Figure b. Tukey test for analysis of means of the species Guinea grass (*Megathyrsus maximus*) and Jiggs (*Cynodon dactylon*) between treatments.



# Crude Fiber of Buttercup (*Thitonia diversifolia*)

Figure b. Duncan test for analysis of means of the *Thitonia diversifolia* species between treatments.



## Descriptive statistics

Treatment/Variable	Crude Fiber (%)
<i>Thitonia diversifolia</i> (Control)	18.45 ± 1.20b
<i>Thitonia diversifolia</i> (KPCB)	22.38 ± 1.66a <b>(+21%)</b>

Origin	DF	Sum of squares	Square of the mean	F value	Pr > F
Model	1	20.54083333	20.54083333	11.51	0.0275
Error	4	7.13790000	1.78447500		
Corrected total	5	27.67873333			

R-squared	Var. Coef.	Root MSE	Avg. CRUDE FIBER
0.742116	6.759196	1.335842	19.76333

Figure a. Anova for the species *Thitonia diversifolia*.