

Methods of Establishment of Pinto Peanut and Palisadegrass in the Amazon Region of Tocantins State in Brazil

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INTRODUCTION

- In Brazil, grasslands are characterized by extensive grazing systems with predominantly warm-season grasses.
- The use of perennial warm-season legumes is a potential management practice to add N to warm-season grass pastures.
- Pinto peanut (*Arachis pinto* Krap. and Greg.) is a warm-season perennial legume used as forage in tropical and subtropical regions;
- However, management practices to establish pinto peanut and palisadegrass pastures have not been explored.

OBJECTIVES

- The objective of this study was to evaluate the establishment of ‘Amarillo’ pinto peanut, ‘Marandu’ palisadegrass (*Urocloa brizantha*), or pinto peanut-palisadegrass intercropped during the growing season in Brazil.

MATERIAL AND METHODS

- The experiment was conducted from January to May 2015 and 2016 in Araguaina, TO, Brazil (7°11’28”S, 48°12’26”W).
- Treatments were palisadegrass, pinto peanut, or pinto peanut-palisadegrass intercropped distributed in a randomized complete block design with four replicates.
- Plots were 5 x 4 m. Forage was seeded into a prepared seedbed with seeding rates of 8, 10, and 8+10 kg ha⁻¹ for palisadegrass, pinto peanut, and pinto peanut-palisadegrass respectively. Pinto peanut was seeded with 0.5 and 2.0 m between rows in the pinto peanut and pinto peanut-palisadegrass treatments, respectively.
- Plots were fertilized with 30 kg N, 26 kg P, and 50 kg K ha⁻¹ after overseeding.
- Palisadegrass herbage accumulation (HA), leaf area index (LAI), tiller density, and leaf:stem ratio were evaluated every 28 d. In addition, pinto peanut frequency and ground cover were evaluated every 28 d interval in the same location at the experimental unit.
- Data were analyzed using PROC MIXED of SAS with treatment and months as fixed effects and blocks as random effect. Months were analyzed as repeated measurements. Means were considered different when $P < 0.05$.



Pinto peanut

Pinto peanut-palisadegrass

RESULTS

- There was no difference in palisadegrass response variables between treatments (Table 1).

Table 1. Herbage characteristics of palisadegrass plots with palisadegrass and pinto peanut-palisadegrass intercropped

Response variables	Treatments		SE	P value
	Palisadegrass	Pinto peanut-Palisadegrass		
Herbage Accumulation, kg ha ⁻¹	1169	1119	111.5	0.65
Leaf area index, m ² m ⁻²	1.98	1.89	0.1	0.59
Tiller density, tiller m ⁻²	572	586	38.3	0.72
Leaf:stem ratio	0.91	0.91	0.009	0.60

- There was an increase in palisadegrass HA, LAI, and tiller density from February to May in both treatments. Conversely, leaf:stem ratio decreased from February to May. (Table 2).

Table 2. Month effects on herbage characteristics of palisadegrass plots with palisadegrass and pinto peanut-palisadegrass intercropped

Response variables	Month				SE
	February	March	April	May	
Herbage Accumulation, kg ha ⁻¹	839 b [†]	981 b	1420 a	1336 a	141.1
Leaf area index, m ² m ⁻²	1.5 b	1.6 b	2.4 a	2.1 a	0.2
Tiller density, tiller m ⁻²	501 b	515 b	626 a	674 a	42.4
Leaf:stem ratio	0.95 a	0.90 b	0.89 b	0.89 b	0.015

[†]Means followed by the same letter are not different ($P < 0.05$)

RESULTS (cont)

- Pinto peanut frequency and ground cover was greater for pinto peanut than pinto peanut-palisadegrass plots (Table 3).

Table 3. Pinto peanut frequency and cover of pinto peanut and pinto peanut-palisadegrass plots

Response variables	Treatments		SE
	Pinto peanut	Pinto peanut-Palisadegrass	
Ground cover, %	29.3 a [†]	7.7 b	3.2
Frequency, plants m ⁻²	55.7 a	23.2 b	3.0

[†]Means followed by the same letter are not different ($P < 0.05$)

- Pinto peanut plant frequency and ground cover increased from February to May (Table 4).

Table 4. Month effects on pinto peanut ground cover and plant frequency

Response variables	Month				SE
	February	March	April	May	
Ground cover, %	14.5 c [†]	17.3 bc	19.6 ab	22.6 a	3.3
Frequency, plants m ⁻²	30.4 c	37.3 b	41.1 b	49.1 a	6.5

[†]Means followed by the same letter are not different ($P < 0.05$)

CONCLUSIONS

- Intercropping pinto peanut with palisadegrass at establishment did not affect palisadegrass HA and may have subsequent beneficial effects on palisadegrass HA by supplying additional N to the system.