

Methods of establishment of Pinto Peanut into Marandu Palisadegrass Pastures in Northern Brazil

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INTRODUCTION

- In northern Brazil, grasslands are characterized by extensive warm-season grasses grazing systems with minimal input of commercial fertilizer.
- The use of perennial warm-season legumes is a potential management practice to add N to warm-season grass pastures in Brazil.
- Pinto peanut (*Arachis pinto* Krap. and Greg.) is a productive, grazing tolerant, warm-season legume used in tropical and subtropical regions.
- However, there is limited information about management practices to overseed warm-season legumes in established warm-season grass pastures in the northern region in Brazil.

OBJECTIVES

- To evaluate methods of establishment of pinto peanut in established plots of 'Marandu' palisadegrass (*Urochloa brizantha*) during the growing season in Brazil.
- To estimate the impact of establishing pinto peanut on palisadegrass herbage characteristics.

MATERIAL AND METHODS

- The experiment was conducted from December 2014 to May 2015 in Araguaina, TO, Brazil (7°11'28"S, 48°12'26" W).
- Palisadegrass plots (5 x 4 m) were established in March 2014 and overseeded with 'Amarillo' pinto peanut with the following treatments 1) establishment of pinto peanut into glyphosate treated rows followed by prepared seedbed, 2) establishment of pinto peanut in glyphosate treated rows with no seedbed preparation (no-till), or 3) intact plots of palisadegrass with no pinto peanut establishment (control). Treatments were distributed in a randomized complete block design with four replicates.
- Pinto peanut seeding rate was 10 kg ha⁻¹ and plots were fertilized with 30 kg N, 26 kg P, and 50 kg K ha⁻¹ after overseeding.
- Palisadegrass height, herbage accumulation, tiller density, leaf:stem ratio, and leaf area index (LAI) were evaluated every 28-d. Pinto peanut ground cover and plant frequency 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 $P < 0.05$.



Prepared Seedbed



No-till

RESULTS (cont.)

- There was no effect of methods of establishment on pinto peanut herbage accumulation and proportion in the harvested forage at the end of the experimental period. In addition, pinto peanut ground cover and plant frequency was similar between treatments.

Table 3. Planting method effects on pinto peanut overseeded into palisadegrass plots

Response variables	Treatment		SE	P value
	Prepared seedbed	No-till		
Herbage accumulation, Mg ha ⁻¹	0.2	0.2	0.12	0.91
Pinto:Palisadegrass proportion % [†]	14	17	0.7	0.55
Ground cover, %	5.3	4.0	0.81	0.39
Plant frequency, plants m ⁻²	14.5	12.9	2.0	0.59

[†] Proportion of pinto peanut in the harvested forage on a dry matter basis

- Pinto peanut plant frequency increased from January to February and there was no difference in February, March, and April. Ground cover increased from January to February but did not differ from January and February in March and April (Table 4).

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

Response Variables	Month				SE
	January	February	March	April	
Ground cover, %	3.5b	5.6a	4.9ab	4.6ab	0.27
Plant frequency, plants m ⁻²	9.3b	14.0a	14.7a	16.8a	1.83

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

CONCLUSIONS

- It may not be necessary to prepare the seedbed after glyphosate application to establish pinto peanut into established pastures of palisadegrass pastures.
- Overseeding pinto peanut into established palisadegrass pastures with glyphosate application followed by prepared seedbed or no-till decrease palisegrass herbage accumulation and stocking rate must be adjusted accordingly.

RESULTS

- There was no difference in palisadegrass response variables between treatments with seedbed preparation or no-till; however, there was a decrease in palisadegrass herbage accumulation, leaf area index, and tiller density when pinto peanut was overseeded into the plots (Table 1).

Table 1. Palisadegrass herbage characteristics of plots overseeded with pinto peanut

Response Variables	Treatments			SE
	Prepared Seedbed	No-till	Control	
Herbage accumulation, Mg ha ⁻¹	1.4b [†]	1.4b	1.9a	0.13
Herbage height, cm	29	30	31	0.8
Leaf:Stem ratio	0.83	0.83	0.85	0.017
LAI, m ² m ⁻²	2.2b	2.0b	2.9a	0.21
Tiller density, tiller m ⁻²	894b	867b	1088a	73

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

- Palisadegrass decreased herbage accumulation, herbage height, and LAI from February to March; while leaf:stem ratio was similar in January, February, and March and increased from March to April. Tiller density did not vary during the experimental period (Table 2).

Table 2. Month effects on herbage characteristics of palisadegrass plots overseeded with pinto peanut

Response Variables	Month				SE
	January	February	March	April	
Herbage accumulation, Mg ha ⁻¹	1.9a	2.3a	1.1b	0.9b	0.21
Herbage height, cm	37a	36a	24b	24b	1.2
Leaf:Stem ratio	0.79b	0.83b	0.81b	0.91a	0.013
LAI, m ² m ⁻²	3.3a	3.4a	1.5b	1.3b	0.27
Tiller density, tiller m ⁻²	1100	981	800	891	100

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