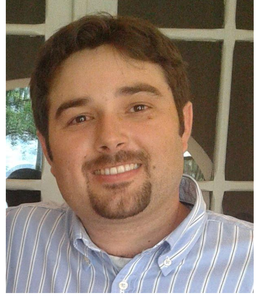

Evaluation of Seeding Strategies of Bahiagrass and Pintoi Peanut on Pasture Establishment.

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INTRODUCTION

- Pintoi peanut (*Arachis pintoi* Krap. and Greg. cv. Amarillo) is a productive and grazing tolerant warm-season legume; however, the slow establishment is one of the main limitations of its use (Carvalho and Quesemberry, 2012).
- Bahiagrass (*Paspalum notatum* Flugge) is the most planted warm-season grass for beef cattle in Florida, and similarly to pintoi peanut, it also takes an extensive time to establish (Gates and Mullahey, 1997).
- There is limited information in the literature about management practices to establish mixed swards of bahiagrass and pintoi peanut.
- Nitrogen fertilization can have a positive effect on bahiagrass establishment (Busey, 1992), however, it can also affect botanical composition in grass-legume mixtures (Templeton and Taylor, 1966).

OBJECTIVES

- To evaluate the establishment of bahiagrass and pintoi peanut seeded alone or mixed with each other.
- To evaluate N fertilization effect on establishment characteristics.

HYPOTHESIS

- Slow initial growth of both plants will minimize competition in early establishment.
- Greater N fertilization will benefit grass establishment.

MATERIAL AND METHODS

- The experiment was conducted from June to October 2014 and 2015 at the UF/IFAS Range Cattle Research and Education Center, Ona, FL.
- Treatments were the split-plot arrangement of pintoi peanut alone, bahiagrass alone or bahiagrass-pintoi peanut mixtures (main plot, 4x4 m), with or without an extra 50 kg ha^{-1} N fertilization (sub plot, 2x4 m), distributed in a complete randomized blocks design with four replicates.
- Seeding rates for bahiagrass and pintoi peanut were 25 and 10 kg ha^{-1}, respectively.
- All plots were fertilized with 30, 13 and 25 kg ha^{-1} of N, P, and K 15 d after seeding. Extra N was applied 32 d after seeding.
- Every 28 d, plots were mowed at 10 cm stubble height, for weed control.
- Plant density and frequency were evaluated every 28 d (month) while ground coverage and herbage mass proportion were evaluated only at the end of each year.
- Data was analyzed using PROC MIXED of SAS with treatment and month as fixed effects. Means where considered different when $p<0.10$.

RESULTS AND DISCUSSION

Density and Frequency

- Density of bahiagrass was only affected by seeding strategy ($p<0.09$; Table 1). Conversely, density of pintoi peanut was not affected by either seeding strategy ($p>0.35$; Table 1) or month ($p>0.12$), but was affected by N ($p<0.07$; Table 2).

Table 1. Effect of seeding strategy on response variables of bahiagrass and pintoi peanut.

Variables	Seeding strategy		SE[1]	*p*-value
	Plant alone	Mixture		
Bahia Density (plants m^{-2})	50.9	39.6	7.26	**0.09***
Bahia Frequency	38.8	36.8	5.52	0.13
Bahia ground coverage (%)	17.9	13.9	3.96	0.28
Bahia herbage mass proportion (%)	12.4	9.4	2.34	0.32
Pintoi Density (plants m^{-2})	6.6	5.7	0.70	0.35
Pintoi Frequency	11.7	10.4	2.37	0.44
Pintoi ground coverage (%)	2.5	2.2	0.55	0.66
Pintoi herbage mass proportion (%)	1.2	1.4	0.29	0.62

[1]SE: Standard error.. *Significantly different ($p<0.10$).

Table 2. Effect of extra N fertilization on response variables of bahiagrass and pintoi peanut.

Variables	Extra N (kg ha^{-1})		SE[1]	*p*-value
	0	50		
Bahia Density (plants m^{-2})	46.9	43.6	7.14	0.58
Bahia Frequency	35.6	36.8	5.45	0.64
Bahia ground coverage (%)	14.8	17.0	3.96	0.52
Bahia herbage mass proportion (%)	8.2	13.3	2.34	**0.06***
Pintoi Density (plants m^{-2})	5.4	6.8	0.64	**0.08***
Pintoi Frequency	9.9	12.2	2.33	**0.06***
Pintoi ground coverage (%)	2.6	2.1	0.55	0.46
Pintoi herbage mass proportion (%)	1.4	1.1	0.28	0.35

[1]SE: Standard error.. *Significantly different ($p<0.10$).

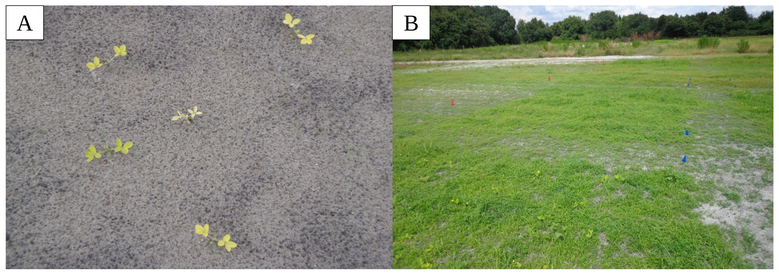

Figure 1. A - Pintoi peanut seedlings; B – Experimental plots.

- Frequency of both plants was affected by month ($p<0.01$; Figure 2). Pintoi peanut frequency was also affected by N ($p<0.06$;Table 2).

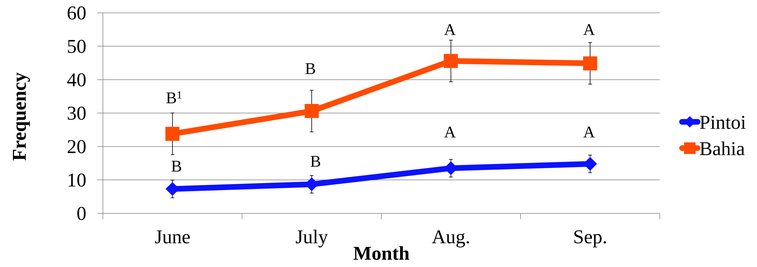

Figure 2. Frequency of bahiagrass and pintoi peanut by month.

[1]Different letters within each plant refer to significant difference among means ($p < 0.10$).

Herbage mass and ground coverage proportion

- Bahiagrass herbage mass proportion was only affected by N ($p<0.08$). Pintoi peanut ground coverage proportion increased with N fertilization ($p<0.06$; Table 2).
- Bowman et al. (1998) reported that pintoi peanut had greater ground coverage when it was planted alone than planted with bahiagrass (13.7 vs. 9.9%), however, planting method and period of evaluation was not the same as used in this experiment.

CONCLUSION

- Intercropping bahiagrass-pintoi peanut is more detrimental to bahiagrass than pintoi peanut establishment.
- A second N fertilization can improve the establishment of both plants.

REFERENCES

- Busey, P. 1992. Seedling growth, fertilization time and establishment of bahiagrass. Crop Sci. 32:1099-1103.
- Bowman, A.M., G.P.M. Wilson, B.J. Gogel. 1998. Evaluation of perennial peanuts (*Arachis* spp.) as forage on the New South Wales coast. Trop. Grasslands 32:252-258.
- Carvalho, M.A. , K.H. Quesenberry. 2012. Agronomic evaluation of *Arachis pintoi* (Krap. and Greg.) germplasm in Florida. Arch. Zootec. 61:19-29.
- Gates, R.N., J.J. Mullahey. 1997. Influence of seeding variables on ‘Tifton 9’ bahiagrass establishment. Agron. J. 18:134-139.
- Jones, R.M. 1993. Persistence of *Arachis pintoi* cv. Amarillo on three soil types at Samford, south-estern Queensland. Trop. Grasslands 27:11-15.
- Templeton W. C., T.H. Taylor, 1966. Some effects of nitrogen, phosphorus and potassium fertilization on botanical composition of tall fescue-white clover sward. Agron. J. 58:596-572.