Production and persistence of a native pasture-*Arachis pintoi* association in the humid tropics of Mexico

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Introduction

Arachis pintoi (Ap) is a highly persistent legume. This study aimed at: (i) determining if introducing Ap CIAT 17434 into a native grass (NG) pasture affected its standing dry matter (SDM) and botanical composition (BC, %); and (ii) verifying if Ap would be as persistent as it is with introduced grasses (IG).

Materials and methods

The experiment was carried out from January 1998 to December 2000 in the State of Veracruz (20°02′ N, 97°06′ W; elevation 112 m asl). The hot and humid climate has mean yearly rainfall of 1930 mm and average maximum and minimum monthly temperatures of 29°C and 19°C, respectively. The soils are clay-loam, acid Ultisols (pH 4.1–5.2) of low fertility. The treatments were native grass pasture (NG) and NG + Ap grazed for 1 day and rested for 20 days. Stocking rate was 2 cows/ha in the wet season and 3.2 cows/ha for the remaining time. Botanical composition (BC) distinguished Ap, native grasses (NG), introduced grasses (IG), broad-leafed weeds (BW), narrow-leafed weeds (NW) and native legumes (NL). Flower number, stolon length, rooted nodes and soil seedpod reserves were recorded at regular intervals.

Results

SDM (kg/ha) of NG + Ap was consistently higher ($P < 0.05$) than that of NG: 3758 *vs* 3233 in 1998, 3893 *vs* 2999 in 1999 and 3301 *vs* 2889 in 2000. The treatment effect was significant ($P < 0.05$) for NG and NW, but it did not affect ($P > 0.05$) other components. The effect of year was significant ($P < 0.05$) for all components, except for IG ($P > 0.05$). Ap and IG increased with time, while NG, BW, NW and NL decreased, but the tendency was not as strong (Table 1). Sixty-six percent of the variation in NG content of the pasture was explained by Ap content (Figure 1). Flowering was zero from December to February, but stolon length, rooted nodes and soil seed reserves increased from year to year.

Conclusions

Ap content increased with time, mostly due to its strong stoloniferous habit that led to profuse flowering and high level of seedpod reserves, which confirm its great persistence (Ibrahim and Mannetje 1998).

Management strategies to keep legume content around 30% are needed to maintain a high potential for DM production.

Reference

IBRAHIM, M.A. and MANNETJE, L.'T (1998) Compatibility, persistence and productivity of grass-legume mixtures in the humid tropics of Costa Rica. 1. Dry matter yield, nitrogen yield and botanical composition. *Tropical Grasslands,* **32**, 96–104.

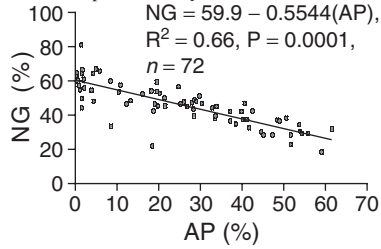

Figure 1. Relationship between Ap and NG contents in a mixed pasture.

Table 1. Botanical composition and reproductive traits of *Arachis pintoi*.

Trait	1998		1999		2000	
	NG	NG + Ap	NG	NG + Ap	NG	NG + Ap
Bot. composition (%)						
AP	–	14.7 A	–	25.2 B	–	36.6 C
NG	67.3 a	52.4 b	69.4 a	44.6 b	68.9 a	40.4 b
IG	7.6 a	4.4 a	6.0 a	7.1 a	10.4 a	3.8 b
BW	15.5 a	16.0 a	12.9 a	9.9 a	12.8 a	11.6 a
NW	4.3 a	7.8 b	5.9 a	9.1 b	3.7 a	5.9 a
NL	5.3 a	4.7 a	5.8 a	4.1 a	4.2 a	1.7 b
Reproduction of *A. pintoi*						
flowers/m^2	–	41 A	–	98 B	–	346 C
m/m^2 of stolons	–	10 A	–	19 B	–	48 C
rooted nodes/m^2	–	205 A	–	397 B	–	516 C
seed pods/ha (10^6)	–	0.9 A	–	1.6 B	–	8.6 C
kg/ha of seed pods	–	123 A	–	207 B	–	765 C

Year means with different capital letter are significantly different ($P < 0.05$); treatment means with different lower case letter are significantly different ($P < 0.05$).