

BRS Mandobi: a new forage peanut cultivar propagated by seeds for the tropics

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Introduction

Forage peanut (*Arachis pintoï*) is a forage legume of relatively recent use in beef and dairy cattle feeding. Although it is native exclusively to Brazil, the first cultivar, Amarillo, was released in Australia in 1987. Forage peanut has a great number of favorable attributes for establishing grass-legume mixtures, which guarantee the persistence and high yields of high quality forage in cultivated pastures. Therefore, studies with this species have intensified in many tropical regions of the world (Assis and Valentim 2009). In the state of Acre, western Brazilian Amazon, 137,000 ha are cultivated with forage peanut, cv. Belmonte, benefiting thousands of producers, with an annual economic impact of USD 46M (Embrapa 2012). Social and environmental impacts resulting from the use of this legume are also highly positive. However, despite the success achieved in mixed pastures with forage peanut, expansion of the area sown has been relatively slow because vegetative propagation using stolons is labor-intensive and requires large quantities of limited vegetative material. In Brazil, Embrapa has coordinated the development of new forage peanut cultivars and their evaluation in different biomes. The objective of this work is to present a new cultivar of forage peanut propagated by seeds, developed by Embrapa for use in tropical regions, in partnership with Unipasto (Association for Promotion of Forage Breeding Research).

Methods

The Brazilian Forage Peanut Evaluation Network started in 1999 and included experiments in the states of Acre, Bahia and Distrito Federal. Development of the new

cultivar was based on mass selection over 5 years, followed by evaluation of environmental adaptation in pure stands and in mixed pastures in the western Brazilian Amazon. During the evaluation process, selection was performed to improve speed of establishment, dry matter yield, nutritive value and seed production. Evaluations also occurred under rotational grazing in mixed pastures with *Cynodon nlemfuensis*, *Brachiaria brizantha* and *B. humidicola*, in intensive systems. The new cultivar was registered with the Ministry of Agriculture, Livestock and Food Supply of Brazil in 2008 and its protection process was finalized in 2011, after conducting tests for distinctness, homogeneity and stability. While developing the cultivar, the semi-mechanized seed production system of forage peanut was also established (Assis et al. 2011).

Results and Discussion

The new forage peanut cultivar, named BRS Mandobi, presents long and wide leaflets, with high intensity of bristles on the abaxial face of basal leaflets. The basal leaflet apex is acute, whereas the predominant form of the apical leaflet apex is obtuse and its form is obovate. Flowers are yellow and the hypanthium is long. Mandobi presents large stipules in its free portion, not welded to the petiole. Its fruits are also large, compared with cvv. Amarillo and Alqueire-1 (Assis et al. 2011).

Mandobi is adapted to tropical and equatorial regions over a rainfall range of 1,200 to 3,500 mm/year. It has high vigor, good leaf:stem ratio and a high degree of tolerance to soil waterlogging. The new cultivar shows good establishment, high dry matter yield and high seed yield (Table 1). It is estimated that in one kilogram there are 6,500 seeds. In the environmental conditions of Acre, a mixed pasture with marandugrass (*B. brizantha* cv. Marandu), *Pueraria phaseoloides* and Mandobi reached an annual carrying capacity of 2.5 AU/ha without irrigation or nitrogen fertilization. Mandobi has persisted for more than 10 years in mixed pastures with

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Cynodon nlemfuensis, *Brachiaria brizantha* and *B. humidicola* under intensive rotational grazing. Its use in regions with prolonged drought (above 4 months) is the subject of further research.

Five diseases caused by fungi have been observed in Mandobi, without serious consequences (Gonçalves

2011): forage peanut rust (*Puccinia arachidis*), anthracnose (*Glomerella cingulata*; anamorph: *Colletotrichum gloeosporioides*), *Mycosphaerella* leaf spot (*Mycosphaerella berkeleyi*), stem rot and *Athelia* leaf blight (*Athelia rolfsii*) and *Rhizoctonia* leaf blight (*Thanatephorus cucumeris*).

Table 1. Main traits of *Arachis pintoi* cv. BRS Mandobi, the new forage peanut cultivar developed by Embrapa for use in tropical regions.

Trait	Value	Observation	Reference
Ground cover	90%	16 weeks after planting, spacing of 0.5 x 0.5 m	Assis et al. 2008
Forage yield	9–15 t/ha	10 months after planting	Balzon et al. 2005
Pure seed yield	3000 kg/ha	18–21 months after planting	Valentim et al. 2009
Annual carrying capacity	2.5 AU/ha	mixed Marandugrass-Mandobi pastures	Andrade et al. 2012
Crude protein	22.8%	average of rainy and dry seasons	Santos 2012
Neutral detergent fiber	53.8%	average of rainy and dry seasons	Santos 2012
Acid detergent fiber	27.6%	average of rainy and dry seasons	Santos 2012
Dry matter digestibility	65.8%	annual average	Oliveira et al. 2011

In Brazil, Amarillo is the only cultivar whose seeds are available in the market, imported from Bolivia and Peru. Amarillo seeds are sold at a very high price, which prevents wide adoption of forage peanut in mixed pastures (Embrapa 2012). In January 2013, the price was around USD 45/kg. Moreover, the cost of local production of Mandobi seeds, based on the production system developed by Embrapa, was around USD 8/kg in 2011 (Assis et al. 2011), showing that national production of seeds using appropriate technologies can significantly reduce the price of seed, enabling its wider adoption by producers.

Conclusion

The development of cv. Mandobi, combined with an efficient seed production and distribution system, should increase the supply of forage peanut seeds at reduced cost. This presents a new option for producers in the tropics wishing to introduce a persistent, high-yielding forage legume of high quality into their production systems by planting seeds.

Mandobi is also an excellent option for recovery of degraded pastures in the Amazon, especially in regions with impermeable soils, where marandugrass is dying.

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