

# Evaluation of tropical forage species under limited water supply

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## Summary

A field plot study was conducted over three years, which compared six exotic grass species planted in July 1994, in terms of dry matter (DM) yield, crude protein and *in vitro* digestibility. The genotypes evaluated were *Paspalum dilatatum*, *Paspalum urvillei*, *Pennisetum clandestinum*, *Pennisetum purpureum*, *Setaria sphacelata* var. *sericea* x *S. sphacelata* var. *splendida* (Splenda) and *Setaria splendida*. Three of them, namely *P. dilatatum*, *P. clandestinum*, and Splenda established well and rapidly after planting. Only by the third year was a good stand obtained with *Setaria splendida* and this genotype supplied only one harvest, in November 1996.

Over all three years, total yield tended to be highest with Splenda, which produced 3126, 8438 and 14022 kg ha<sup>-1</sup> of total DM yield for 1994, 1995 and 1996 respectively. Of the species which produced harvestable yield in every year, *P. clandestinum* had DM yields, but seemed to have the most consistent yields for the harvests in a year. This species showed good characteristics for permanent pastures due to its prostrate growth habit and ease of spread over the soil.

Forage nutritive value, as measured by crude protein concentration and *in vitro* dry matter digestibility, was greatest in the species which was one of the most difficult to establish: *P. purpureum*.

Keywords: Forage, tropical species, nutritive value.

## Introduction

In order to determine the potential for the introduction of tropical forage species in dry regions, an experiment was conducted under limited water supply at Mitra Experimental Research Centre, University of Évora, Portugal.

## Materials and methods

A field trial was set up at the end of July 1994, with material supplied from a collection at the National Agronomic Institute (Oeiras, Portugal). Six grass species were tested: *Paspalum dilatatum*, *Paspalum urvillei*, *Pennisetum clandestinum*, *Pennisetum purpureum*, *Setaria sphacelata* var. *sericea* x *S. sphacelata* var. *splendida* (Splenda) and *Setaria splendida*, and these were monitored for three years to determine dry matter yield (DM), crude protein (CP), and *in vitro* dry matter digestibility (IVDMD).

The trial was implanted in a gleysol soil with pH (H<sub>2</sub>O) 7.2, 352 mg kg<sup>-1</sup> P and 299 mg kg<sup>-1</sup> K. Only nitrogen was applied as fertiliser, at a rate of 50 kg ha<sup>-1</sup> at planting, at the beginning of the growing period (spring) and after each harvest. The experimental design was a randomised complete block with four replicates. The plots were 2 x 2.5 m, with four rows 50 cm apart. Species were planted at the rate of 80000 plants ha<sup>-1</sup>. The amount of irrigation applied in 1995 was 3067 m<sup>3</sup> ha<sup>-1</sup>, supplied in twenty-three applications per week. In 1996 the