

# Modelled long-term productivity of buffel grass pastures with and without legumes in central Queensland

Giselle L. Whish<sup>A,B</sup> and Gavin A. Peck<sup>A</sup>

<sup>A</sup>Department of Agriculture and Fisheries, PO Box 102, Toowoomba, Qld 4350.

## Introduction

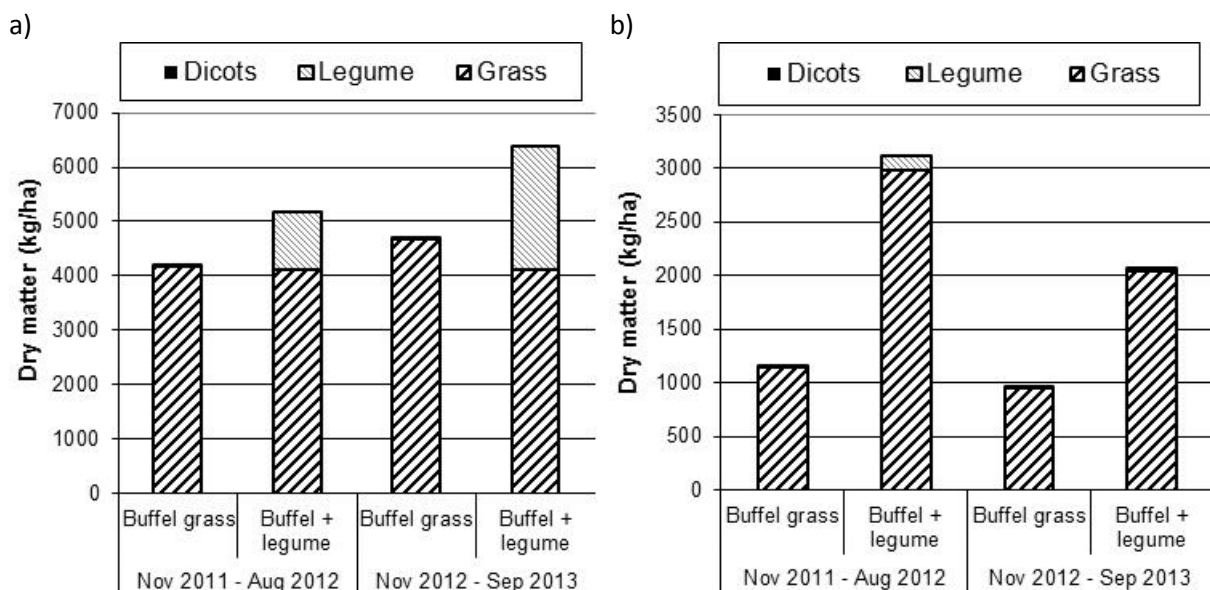
Pasture productivity benefits of sowing legumes with buffel grass have mainly been measured three to five years after establishment and only in a few environments. Simulation models allow extrapolation of trial results in time and space. Site data collected from two locations in central Queensland were used to simulate the productivity of grass only and grass with legume pastures that were established approximately 15 years previously.

## Methods

Pasture trials at Wandoan and Moura were established into paddocks that had a history of cropping. Each trial had 10 ha sown to buffel grass and 10 ha sown to buffel grass and a legume. The Moura site was sown with *Caatinga stylo* (cv. Primar and Unica) early in 1997 and the Wandoan site was sown with *Desmanthus* early in 1995. Detailed pasture production measurements were collected from the sites over two years (2011-2013) and used to calibrate the pasture growth GRASP model.

## Results and discussion

Legumes increased total pasture productivity by 23-35% at the Moura site and by 113-170% at the Wandoan site over the two years of sampling (Fig. 1). Key biological and physical pasture processes were well represented in the calibrated grass only and grass plus legume GRASP models for both trial locations. The degree to which “resetting” the sites impacted on the growing points of stylo and buffel plants, and the adequacy of the trial sites to represent broader buffel grass and buffel plus legume pastures needs to be determined. However, the calibrated models can extend and improve estimates of long-term pasture productivity benefits of sowing legumes with buffel grass within central Queensland.



**Fig. 1.** Peak dry matter production (kg/ha) for each year of sampling between 2011-2013 for buffel grass only and buffel grass with legume pastures at a) Moura and b) Wandoan sites.

<sup>B</sup>Corresponding author: giselle.whish@daf.qld.gov.au