

## Evaluation of Pigeon pea (*Cajanus cajan*) Varieties for Biomass Yield and Quality Parameters under Irrigation in three districts of South Omo, South-Western Ethiopia

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### Abstract

The deficit in quantity and quality of feed in one of the major nutritional impairments that are affecting livestock production in South Omo. Pigeon pea species is among the legume fodder species, which has been playing a pivotal role in providing a high quality protein to the livestock. This study was initiated to evaluate biomass yield and quality parameters of five feed-type pigeon pea varieties. The five feed-type pigeon pea varieties such as DZ-16555, DZ-00420, DZBS, Tsegabe and local pigeon pea were evaluated in a randomized complete block design with three replications per variety. The agronomic parameters, biomass yield and quality parameters were analyzed by using Generalized Linear Model (GLM) procedures of SAS and Least Significance Difference (LSD) was used for mean comparison among tested varieties. The DZ-16555 variety gave higher ( $p < 0.05$ ) biomass yield ( $21.27 \text{tha}^{-1}$ ), while local variety gave the lowest ( $12.54 \text{tha}^{-1}$ ) biomass yield. Correspondingly, DZ-16555 variety had higher ( $p < 0.05$ ) crude protein ( $270.18 \text{gkg}^{-1}$ , DM) over the local variety ( $190.91 \text{gkg}^{-1}$ , DM). Based result from this study, it was concluded that DZ-16555 pigeon pea variety was best candidate to improve feed and nutritional supply for enhanced production from livestock.

**Key words:** Acid detergent fiber, Biomass yield, Crude protein, Neutral detergent fiber and variety

### Introduction

The overall production and productivity performances of livestock in Ethiopia are generally low due to different reasons. The year round deficit in quality and quantity in animal feeds are one of the nutritional impediments that are affecting the livestock performances (Adugna *et al.*, 2012; FAO, 2018). Likewise, in study areas, the livestock feeding system is completely natural-pasture-based (Denbela *et al.*, 2017, Brehanu *et al.*, 2017) which is greatly influenced by nutritional dynamics of range-forages (FAO, 2018, Hidosa *et al.*, 2018). Moreover, feeds from this source could not been met the nutrient requirements of animals particularly in the dry

seasons and inconsistently distributed over the seasons in the study areas (Brehanu *et al.*, 2017; Denbela *et al.*, 2017; Hidosa *et al.*, 2018). This is triggering to increase low growth rate, high mortality, longer calving intervals and substantial weight loss (Brehanu *et al.*, 2017; Denbela *et al.*, 2017; Hidosa *et al.*, 2018).

Pigeon pea (*Cajanus cajan*) is a popular source of vegetable protein in the human and animal diets (Sharma *et al.*, 2011). It produces high quality fodder and can be integrated to crop-livestock-farming system as animal feed supplements (Rao *et al.*, 2003). The crude protein content of high-quality pigeon pea leaves ranges from the



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reported values of (6.47t ha<sup>-1</sup>) and (5.42t ha<sup>-1</sup>) by Abusa *et al.* branches per plant at Hamar district than Desech and Muzotam

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