Canavalia brasiliensis and *Vigna unguiculata* at different growth stages

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1. INTRODUCTION

- The weak perennial legume *Canavalia brasiliensis* (Fig. 2) can be grown on a wide range of soil pH (4.3–8.0) on low fertile soils up to a height of 1800 masl and has a good regrowth up to the second year.
- The annual *Vigna unguiculata* (Fig. 1) shows even a wider range of environmental adaptation.
- The crops were investigated for the assumed high level of crude protein which suggests a good suitability as feed supplement for ruminants and possibly even for swine.

Fig. 1: *Vigna unguiculata,* 10 weeks old

Fig. 2: *Canavalia brasiliensis,* 20 weeks old

2. MATERIALS & METHODS

Canavalia brasiliensis CIAT17009 and *Vigna unguiculata* 9611 were established in September 2007 at Palmira station, Colombia, in quadruplicate.

- Each plot had a size of 5 m×3 m.
- Row-spacing was 70 cm and within rows 30 cm or 20 cm respectively for *Canavalia* and *Vigna* at a sowing rate of 20 kg/ha.
- *Canavalia* forage was harvested at 8, 12, 16 and 20 weeks of growth, *Vigna* at 6, 8, 10 and 12 weeks.
- Yield and feed value of the total above-ground plant were determined.

3. RESULTS

- The dry matter (DM) yield of *Canavalia* developed slowly from 1.1 t/ha after 8 weeks of growth to 3.6 t/ha after 12 weeks, then to 6.1 t/ha at 16 weeks and doubling 12.3 t/ha DM after 20 weeks (Fig. 3).
- The DM content rose from 21 to 24% from 8 to 16 weeks, and to 39% after 20 weeks.
- The fast growing *Vigna* started with a DM yield of 1.7 t/ha (6 weeks), and increased to 3.5, 5.1 and 8.5 t/ha with 8, 10 and 12 weeks.

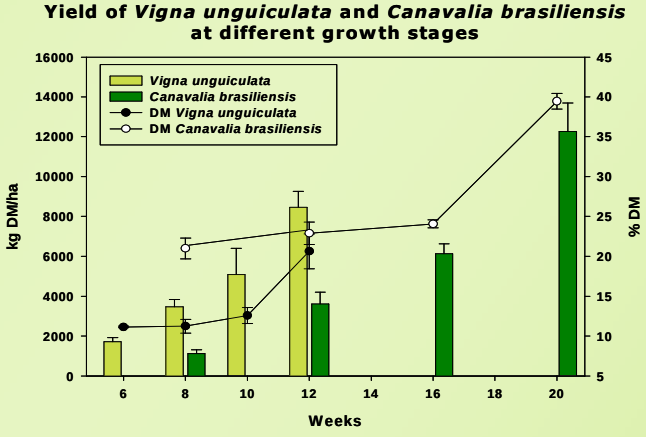

Fig. 3: Yield and dry matter at different ages, error bars = standard deviation

- *Vigna* had a high water content in the stems, resulting in a total DM of 11–13% until 10 weeks. Only in the final stage of pod ripening the DM content rose to 21%.
- In terms of feed value *Canavalia* had a markably lower digestibility compared to *Vigna* and generally a higher fibre content (Fig. 4).
- Throughout the weeks 6 to 10 *Vigna* had a high in-vitro DM digestibility (IVDMD) for ruminants of > 74% and a crude protein (CP) content of 20–17% in DM in comparison to 59–65% IVDMD and around 12% CP of *Canavalia* from 8–20 weeks (Fig. 5).

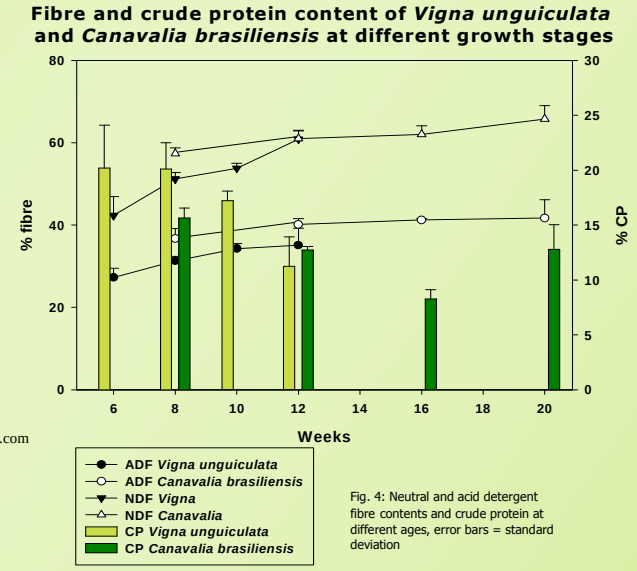

Fig. 4: Neutral and acid detergent fibre contents and crude protein at different ages, error bars = standard deviation

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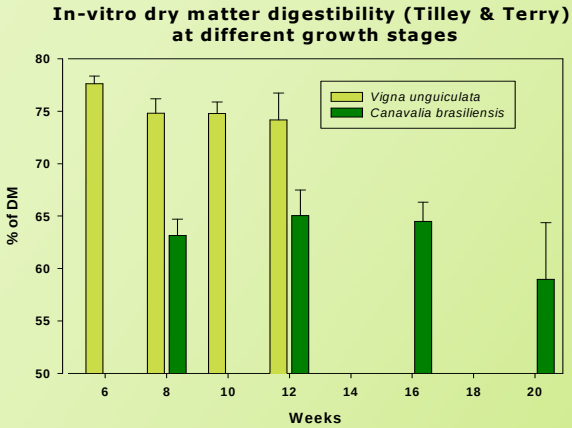

Fig.5: *In-vitro* dry matter digestibility at different ages for ruminants, error bars = standard deviation

4. SUMMARY & CONCLUSIONS

- *Vigna unguiculata* is a fast growing legume with a constantly high digestibility for ruminants, harvest with 10 weeks recommended.
- *Canavalia brasiliensis* had high yields after 16 weeks of growth whereas digestibility decreased probably due to the high fibre content.
- In general, *Canavalia* had a lower crude protein content and digestibility compared to *Vigna*.
- However, depending on the general nutritional status of cattle and feeding options, this multipurpose tropical forage legume might be a good supplement to the basic feed.

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