

# THE USE OF CAFETERIA TRIALS FOR THE SELECTION OF *DESMODIUM OVALIFOLIUM* GENOTYPES

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## Introduction & Objective

- Species and genotype selection of pasture plants is often exclusively based on cutting experiments and laboratory analyses, not taking into account possible forage plant x animal interactions.
- In tropical forage legumes that contain anti-nutritive components such as tannins, relative acceptability of genotypes to ruminants is of particular importance. These plant components may influence selective grazing behaviour (plant x animal interactions) and subsequent animal productivity, which are not predictable from laboratory forage quality analyses.
- Desmodium heterocarpon* subsp. *ovalifolium* (“*Desmodium ovalifolium*”) is such a legume, in which marked genotype x environment interactions seem to determine forage quality. As part of a multilocational germplasm evaluation project, a core collection of 18 *D. ovalifolium* accessions was tested for relative acceptability to cattle in a cafeteria trial in two contrasting environments in Colombia.
- The objective was to assess the usefulness of cafeteria trials for the selection of genotypes and, in particular, to confirm genotype selection based on laboratory data.

## Material & Methods

- Two contrasting environments:
  - La Romelia (Andisol, 1360 masl, 2680 mm/a, 20.9 °C) and
  - La Rueda (Ultisol, 180 masl, 3100 mm/a, 26 °C).
- Trials were conducted in the respective wet seasons in 1996/97.
- Plot size was 30 m<sup>2</sup> (6 x 5 m); between plots were 1 m wide strips planted with *Brachiaria dictyoneura*.
- Prior to the trials, animals were adapted to the new legume for a three day period.
- Based on four days of observations (7 am – 5 pm, five minute intervals), animal activity profiles per site and relative acceptability indices for each accession were calculated (no. of observations of a given accession being grazed / total no. of grazing observations expected in the respective block, if all accessions were of equal acceptability). Accessions with low relative acceptability score indices <1, those with higher acceptability >1.



Cafeteria trial at La Rueda



Animal adaptation at La Romelia



*D. ovalifolium* grazing at La Romelia

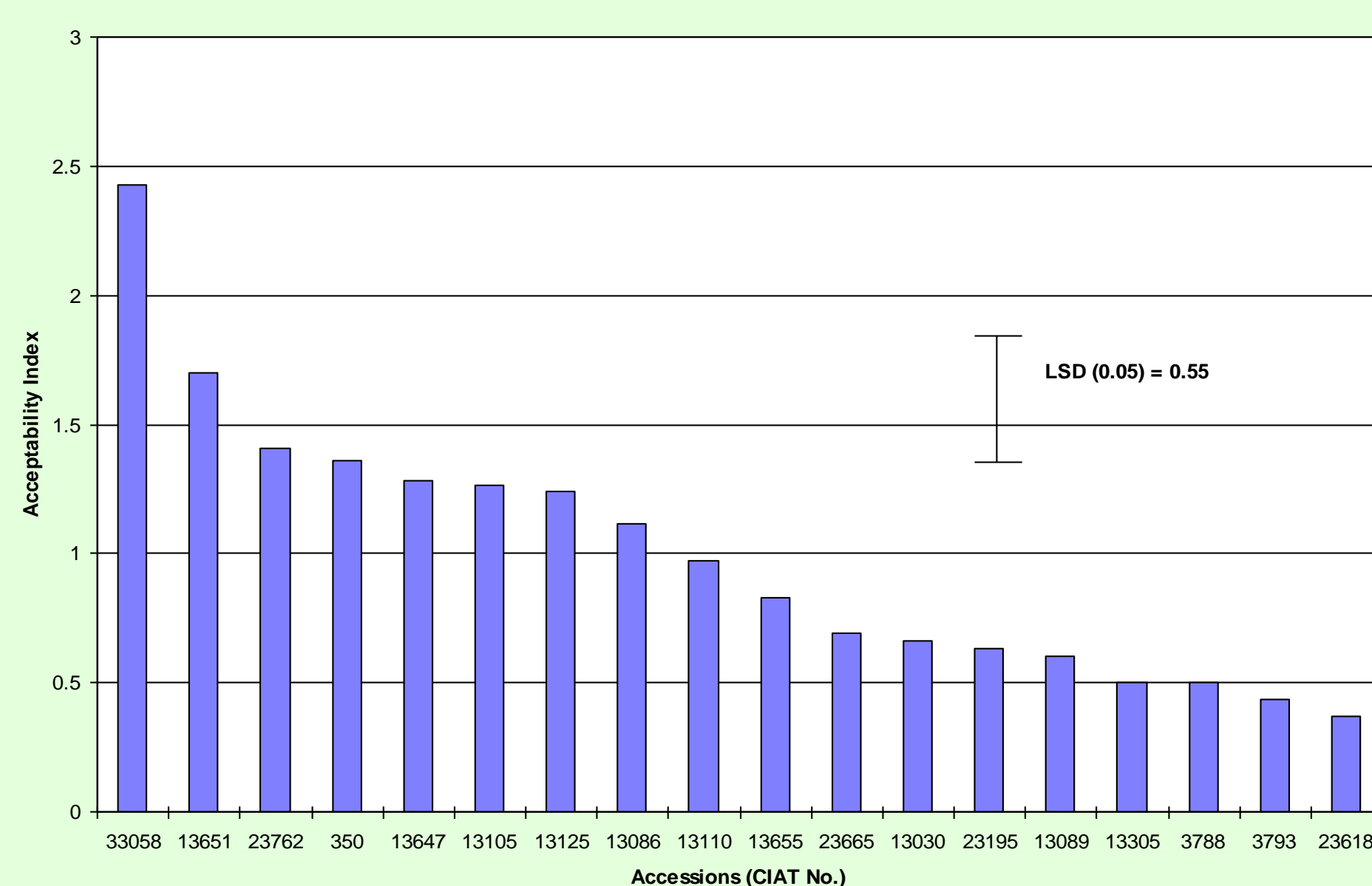


Figure 1. Acceptability indices of eighteen accessions of *Desmodium ovalifolium* in the wet season at La Romelia, Chinchiná, Caldas (Colombian coffee zone)

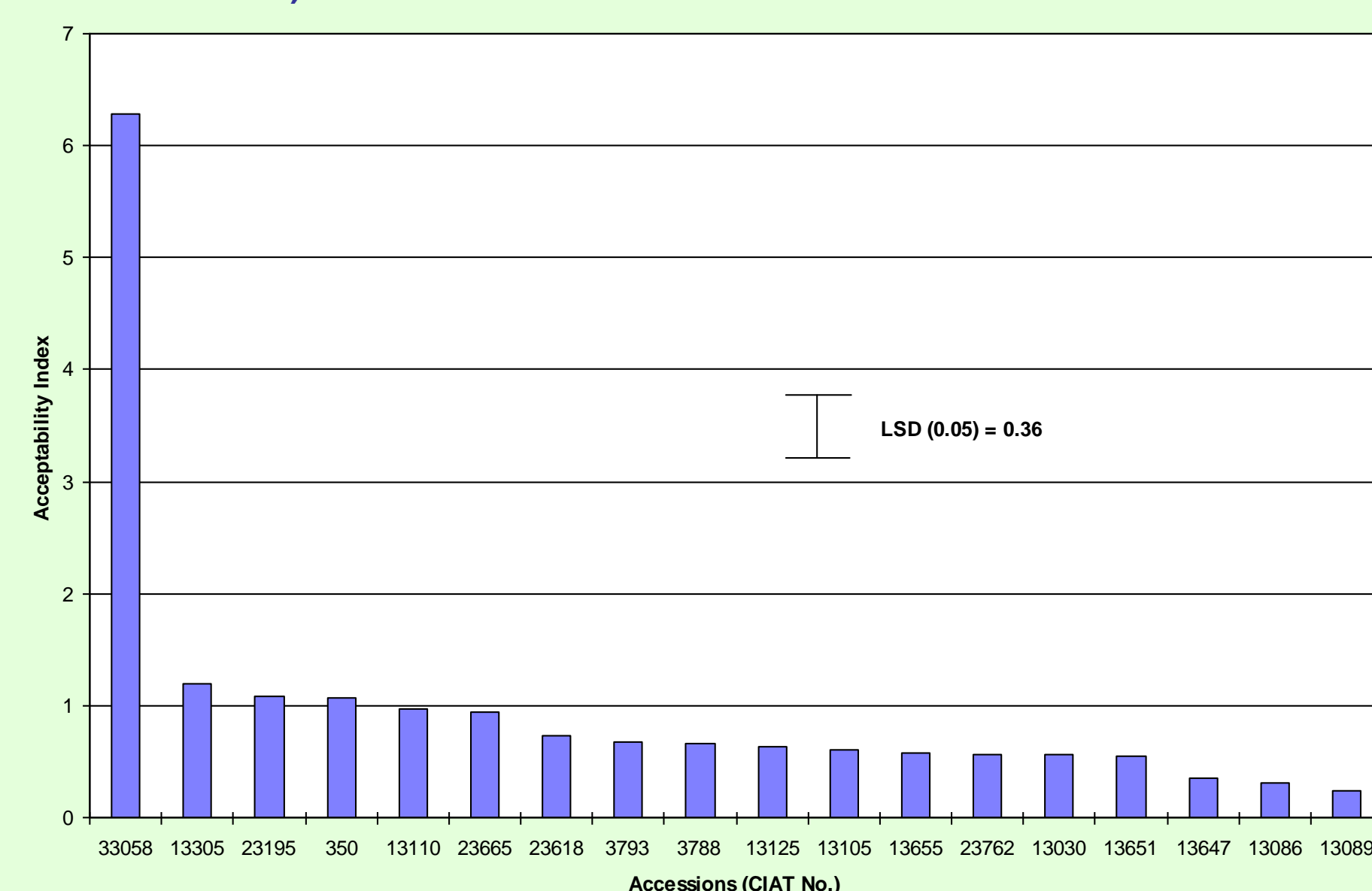


Figure 2. Acceptability indices of eighteen accessions of *Desmodium ovalifolium* in the wet season at La Rueda, Florencia, Caquetá (Colombian Amazon basin)

## Results

- Accessions ranked differently at both sites. Overall, CIAT 33058 showed outstanding acceptability (Figs 1 and 2). This indicates not only pronounced G x E interactions ( $p < 0.0001$ ), but also possible genotype x environment x animal interactions.
- The well known genotype CIAT 13089 showed low acceptability indices at both sites.
- Top ranking accessions in the cafeteria trials are identical to those accessions, which had been selected in earlier stages of the evaluation project on the basis of a large series of laboratory quality analyses.
- Different animal activity profiles at the two sites demand further investigation. Heat stress at La Rueda might explain the animal activity profiles different from those at La Romelia, as well as the smaller range of differences in acceptability indices generally recorded at the former site.

## Conclusion

Cafeteria trials are a useful, resource efficient and rapid instrument to assist in the selection of forage germplasm. The integration of the animal into the ultimate decision step – which means also the incorporation of plant x environment x animal interactions – is a convenient tool for the validation of laboratory data and should be regarded as a standard step in germplasm selection projects.