

Allelopathy in the tropical forage grass *Brachiaria brizantha*

Rebekka Pohl, Elke Fischer and Rainer Schultze-Kraft
University of Hohenheim (380), 70593 Stuttgart, Germany

Pastures with *Brachiaria brizantha*

Species of the tropical genus *Brachiaria* are widely used in improved pastures. However, field observations with the widespread *B. brizantha* cv. Marandu indicate that it can be difficult to establish and maintain mixtures with a legume. Furthermore, in grass-only pastures complete lack of seedling recruitment has been observed (Fig. 1).



Fig. 1 5-year-old *B. brizantha* cv. Marandu pasture in Venezuela

A reason for both phenomena could be allelopathy. Allelopathic effects are complex and refer to the release of chemicals (e.g. by root exudation) from a plant affecting the growth and development of other plants.

Studying the allelopathic potential

To elucidate the allelopathic potential of cv. Marandu in comparison with three other cultivars of current economic importance, *B. brizantha* cv. Toledo and the *Brachiaria* hybrids Mulato and Mulato II, two laboratory bioassays were conducted with different concentrations of aqueous extracts from a) leaves and b) roots of the four cultivars, testing their effect on (1) the grasses themselves (autotoxicity test) and (2) the forage legumes *Leucaena leucocephala*, *Desmodium ovalifolium* (Fig. 2), and *Pueraria phaseoloides*.



Fig. 2 9-day-old Seedlings of *D. ovalifolium*, different treatments

Results of tests

(1) **Autotoxicity test:** showed germination inhibition and a retarded seedling growth in the treatments with cv. Marandu and Toledo (Fig. 3). This could be caused either by allelopathic effects or the high osmotic potential of the extract solution.

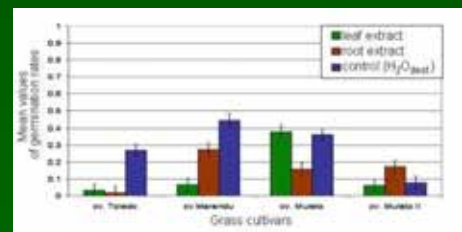


Fig. 3 Germination rates in autotoxicity test

(2) **Tests with legumes:** the leaf extract of cv. Marandu showed mostly not significant effects such as germination inhibition, reduced weight and root length of seedlings of *D. ovalifolium* and *L. leucocephala* (Fig. 4). In contrast, low extract concentrations had beneficial rather than harmful effects on seedling growth of *L. leucocephala*. Similar observations of growth stimulating effects of allelochemicals in low concentrations are reported for other species.

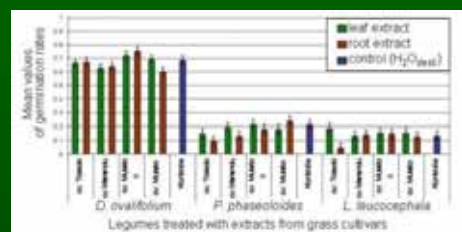


Fig. 4 Germination rates in test with legumes

Conclusions and outlook

The findings confirm the allelopathic potential of cv. Marandu. However, further research is needed to elucidate the complex issue of allelopathy in the genus *Brachiaria*. Research should include work in pastures where alleged allelopathy has been observed as well as a comprehensive participatory survey in order to complement the rather anecdotic information available so far.