USE OF CHARCOAL RESIDUES AS AN ALTERNATIVE SUBSTRACT FOR GROWING MEDIA OF CRAJIRU (*Arrabidaea chica* Verlot.)

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Introduction

Charcoal and pyroligenous acid are among the available growing medias in the Central Amazon region, and are subproducts of the charcoal production process, and considered as plants stimulants especially when applied together (Miyasaka et al., 2001).

Many medicinal plants native to the Amazonian region, such the crajiru (*Arrabidaea chica* Verlot), being studied without taking the agronomic development possibilities into account. A cultivation of crajiru could alleviate disorganized extraction form the wild and the pressure on the native plants population. Crajiru belongs to the Bignoniaceae family and is currently extracted from the forest due to its anti-inflammatory and astringent properties. In spite of this, few agronomic studies have been conducted about this species, thus necessitating greater knowledge about its agronomic management techniques. The development of a production system for this species requires an appropriate growing medium for its propagation (Ocampo, 1999).

Objective

The objective of this research was to study the development of Crajiru in different growing media in Manaus, Amazon, Brazil. Also a detailed characterization of the porosity and the water retention capacity of the growing media were objective of this study.

Material and Methods

The following growing media were used: Plantmax®, charcoal + chicken manure, sand, sand + charcoal and soil + chicken manure. The pyroligenous acid produced by Biocarbo® was applied in a concentration of 0.3% in four applications at weekly intervals. Semi-woody cuttings of crajiru were taken out of the mother plants and cultivated in tubes. A completely randomized 5^2 factorial scheme design was used corresponding to: five types of growing media, with and without application of pyroligenous acid. The experiment had three repetitions and each experimental plot was composed of nine tubes. The plants remained in the greenhouse for 90 days, receiving daily irrigation in the form of intermittent automatic nebulation. The evaluated variables were the number of survivors, height (cm) and number of shoots, weight of the root dry matter and aerial parts. In the Soil physics Laboratory at Embrapa Amazonia Ocidental the water retention capacity of the growing medias were determined at saturated conditions and then successively at pressures of 1.0; 1.5; 1.8; 2.0 and 2.3 pF in a water retention table coupled with a vacuum pump.

Results and discussion

The Crajiru plants on a charcoal growing medium showed greatest growth, while the measured parameters showed no significant difference compared to Plantmax (Figure 1). The plants showed a smaller number of shoots when charcoal and soil were used as a growing medium, compared to the growing medium sand, sand + charcoal and Plantmax. The largest plants showed a smaller number of shoots.

The amounts of dry material in the aerial parts and in the roots were greater with the charcoal and Plantmax growing mediums. Growing mediums sand + charcoal and sand showed the lowest values. From the evaluated parameters, it was observed that charcoal powder could substitute the Plantmax growing medium with similar results, since it shows the same advantages of easy access and low costs.

The Crajiru plants with pyroligenous extract applications tended to generate plants with greater height and greater root- and above ground biomass in the growing mediums of sand, Plantmax and soil. The opposite effect was observed in the charcoal medium.

The sand as growing media showed low water retention capacity and a small range of pores size, The range of pores radii were concentrated between 0.0236 and 0.047 mm. The mix of charcoal residues with sand enhances its capacity of water retention and enlarged the pore size range. The growing media – soil and chicken manure showed lower values of water holding capacity in relation to charcoal residues + chicken manure and Plantmax. The charcoal residues + chicken manure and Plantmax showed very similar porosity and water retention curves.

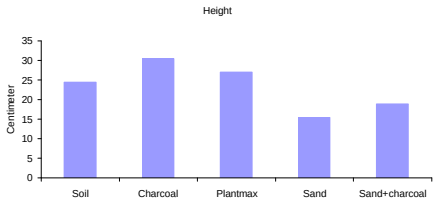

Figure 1 - Height

Figure 2 – Crajiru cultivated with charcoal

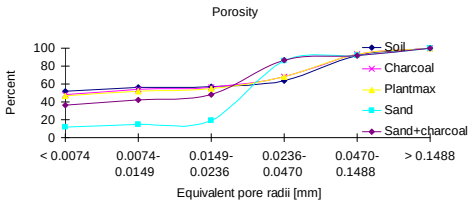

Figure – Pore size distribution of the different growing medias

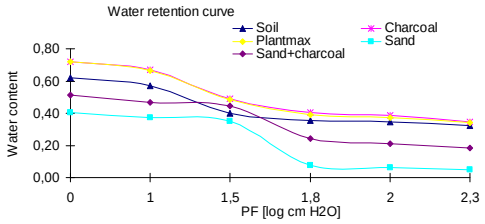

Figure - Water retention curves of different growing medias

Conclusions

This study indicate that for the propagation of crajiru, residues of charcoal can be used to substitute commercial growing media obtaining similar results, accompanied with reduced costs and widespread availability in the area.

References

MIYASAKA, S., OHKAWARA, T., NAGAI, K., YAZAKI, H., SAKITA, M.N. Técnicas de produção e uso do Fino de Carvão e Licor Pirolenhoso In: ENCONTRO DE PROCESSOS DE PROTEÇÃO DE PLANTAS: Controle ecológico de pragas e doenças, 1., 2001, Botucatu. **Resumo...** p.161-176.

OCAMPO, R. Productos florestales no maderables: manejo domesticación y comercialización. Curso: Introducción de los produtos forestales no maderales. Bolivia: 68 p. 1999.