

Title: FORMATION OF COMMON MYCORRHIZAL NETWORK BETWEEN ROOTS OF BRAZILIAN WOODY SPECIES AND ROOTS OF AN EXOTIC INVASIVE GRASS AFFECTS THE ESTABLISHMENT OF WOODY SPECIES SEEDLINGS

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Abstract:

This study aimed to assess the effects of the common mycorrhizal network (CMN) from roots of an exotic grass *Urochloa brizantha* (Hochst. Ex A. Rich.) R. D. Webster in the development of seedlings of Brazilian woody species. In the cultivation pots, a steel mesh (30 µm) was used to produce two compartments: a central and a peripheral compartment. A soil with 10 mg P dm⁻³, 0.42 cmol_c K dm⁻³, and 0.76% of C was used in both compartments. The treatments differed among each other by the presence or absence of arbuscular mycorrhizal fungi (AMF) in the compartments at the beginning of the experiment. They were: 1) central and peripheral compartments without AMF, 2) central compartment with AMF and peripheral compartment without AMF, 3) central compartment without AMF and peripheral compartment with AMF, and 4) central and peripheral compartment with AMF. Each treatment had six repetitions. In the central compartments, one plant of *U. brizantha* was early grown for 60 days. After, two seedlings of two woody species of early stages of Atlantic Rainforest succession, *Bastardiopsis densiflora* (Hook. & Arn.) Hassl. and *Guazuma ulmifolia* Lam., were transplanted to the peripheral compartments of cultivation pots with *U. brizantha*, and were grown for 120 days. In the Treatment 1, all seedlings of both woody species died between 30 and 45 days after the transplanting. In the Treatments 2 and 3 and 4, all seedling of both woody species survived and exhibited high mycorrhizal root infection, between 80% and 96%. However, when the seedlings of woody species were colonized only by the CMN from the grass (Treatment 2), the shoot dry mass of *B. densiflora* (0.04 g) and *G. ulmifolia* (0.07 g) were lower than those seedlings that were grown with AMF only in the peripheral compartment (Treatment 3 - 0.14 g for *B. densiflora* and 1.93 g for *G. ulmifolia*) or both compartments (Treatment 4 - 0.10 g for *B. densiflora* and 0.63 g for *G. ulmifolia*). These results show that the CMN from *U. brizantha* affected the relationship between AMF and the native woody species of early stages of succession, influencing in a growth decrease of their seedlings. It is possible to conclude that the formation of CMN is a mechanism by which *U. brizantha* can hamper the establishment of the pioneer woody species seedlings and change the natural way of the succession, since AMF are very abundant in the beginning of tropical succession.

Keywords: arbuscular mycorrhizal fungi, early-tree, tropical ecological succession, *Urochloa brizantha*

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