

72. Nurse plant effect on mycorrhizal soil infectivity and soil fertility restoration in Madagascar upland rice farming

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On one hand, nurse plant designed those plant species which could have positive effects on the development of other plant species by several aspects. This technology could be a special key to mitigate the effect of climate change on farming by valuing natural resources present in each ecosystem. On the other hand, mycorrhizal soil infectivity and soil enzyme activity are the most sensitive parameters to the variation of plant species' structure and of land use. The long-term experimental site is located in the eastern part of Madagascar. The aim of this study was to select nurse plant among all plant species which are naturally associated with upland rice according to some criteria such as symbiotic status, endemism, distribution, scattering method as well as mycorrhizal soil infectivity and soil enzyme activity related to each selected plant species. We recorded 17 plant species belonging to a functional group of mainly shrub and herbaceous species which are naturally associated with upland rice. There were 5 endemic and 2 naturalized species such as *Aphloia sp*, *Casearia sp*, *Doratoxylon sp*, *Streblus sp* etc. which were both described to be associated with Vesicular and Arbuscular Mycorrhizal Fungi (AMF). The analysis showed that compared to bare soil or rhizosphere soil of other plant species, their rhizospheric soil was characterized by a great diversity of AMF spores and significant activity of soil phosphatase. The most probable number of Mycorrhizal fungi propagules (MPN) in soil was significantly higher in soil colonized by these species. These results suggest that at least one of these selected plant species could be used as a nurse plant to enhance soil fertility for the benefit of upland rice production.