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Category	: International Rice Research Conference
Select Theme	: Systems physiology
Keyword 1	: Root biology
Endorsement email	:
Keyword 2	: Drought tolerance
Keyword 3	: Yield potential
Title of Entry	: Mycorrhizal Influence on Root Traits of Rice Seedlings
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Due to climate change, many farmers will need to begin to cultivate rice in aerobic conditions in order to maintain high yields, despite drier soils. However, our previous studies revealed that many lowland rice cultivars were not adapted to aerobic systems resulting in significant decreases in yields. Arbuscular mycorrhiza (AM) may be an important factor in improving the adaptability of lowland rice cultivars to aerobic conditions. Further experimentation showed aerobic soils more than doubled colonization rates of rice by AM compared to flooded fields. Here, we propose the use of AM to enhance rice adaptation by improving root growth, particularly, lateral root formation. Using chromosome segment substitution lines (CSSLs) it is possible to examine effects of AM on a variety of root traits. In order to determine an appropriate inoculant, rice was grown with one of four species which were isolated from farmland soils in Northern Thailand. After 3 weeks, Glomus mosseae (GM) had the largest impact on lateral root density at 12.3 roots/cm, compared to non-inoculated plants at 8.3 roots/cm. GM was then used alongside with 17 CSSLs contrasting lateral root traits. At 3 weeks after inoculating, the inoculated plants had no significant difference in almost all measured parameters compared to controls. However, lateral root density significantly increased with certain lines being more responsive to mycorrhizal influence. Lines 71, 53, and 78 contained 8.3, 12.8, and 9.7 lateral roots/cm, respectively under control conditions. When colonized, density increased to 18.2, 16.37, and 12. 9 lateral roots/cm respectively.Our findings suggest that colonization of seedlings increases lateral root density. Increased density may allow

poorly performing varieties to acquire water and nutrients more efficiently in an aerobic setting. This knowledge has potential to help farmers in areas affected by climate change to successfully implement aerobic farming.

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