

Category	: International Rice Research Conference
Select Theme	: Climate change and environmental sustainability
Endorsement email	:
Keyword 1	: Water scarcity
Keyword 2	: Adaptation to climate change
Keyword 3	: Environmental sustainability
Title of Entry	: Promoting water deficit tolerance and anthocyanin fortification in pigmented rice cultivar 'Hom Nil' ( <i>Oryza sativa</i> L. subsp. <i>indica</i> ) using arbuscular mycorrhizal fungi (AMF) inoculation
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Drought or water deficit is a major abiotic stress to reduce n growth and productivity in rice crop especially in rain-fed area, which is evidently found the long-term water shortage. The objective of this investigation was to promote the drought tolerant abilities in rice cv. 'Hom Nil' at booting stage using AMF-inoculation in the net house system. Soil water content (%) in the soil was reduced by 25.2% (mild water deficit, MWD) and 13.8% (severe water deficit; SWD) when water withholding for 7 and 14 day, respectively. In AMF inoculation, the colonization percentage and total phosphorus contents in the root tissues were demonstrated in both with and without water deficit conditions. Free proline enrichment in Hom Nil rice was a major osmotic adjustment to control osmotic potential in the cellular levels of root and leaf organs when exposed to water deficit, leading to maintain photosynthetic abilities, chlorophyll pigments, chlorophyll fluorescence and net photosynthetic rate as well as growth performances. Interestingly, sucrose and total soluble sugar contents in the flag leaf were increased by 5.0 fold and 1.5 fold, respectively in plant grown under SWD. Shoot height and number of tillers were significantly declined by 12.5% and 11.6%, respectively when subjected to SWD. In the harvesting, grain yield, panicle dry weight and fertility percentage of recovery AMF-inoculated rice from SWD at booting stage were greater than those

without AMF for 1.5, 3.9 and 2.4 fold, respectively. Cyanidine-3-glucoside and peonidine-3-glucoside contents in pericarp of rice grain were enriched in the grain derived from AMF-inoculation with water deficit stress. Overall growth characters and physiological adaptation in Hom Nil pigmented rice grown under water deficit condition were retained by AMF inoculation, causing to promote yield traits and anthocyanin fortification in the pericarp of rice grain.

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