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Title of Entry	: Growth dynamics and responses of rice roots under well-watered and drought conditions
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Select only one type of presentation	: 3-5 minute flash talk
Abstract	: Rice displays a wide range of morphological, anatomical and physiological adaptation in response to drought. Genotypic variation in root system has been associated with better adaptation under water deficit conditions. To date several root traits have been identified as candidates for rice breeding programs. Despite much information on drought responses, the understanding of growth dynamics and responses of specific root classes under drought are still scarce. In this study, we investigated the growth dynamics of root traits of three rice varieties including KDML105, Siew Mae Jan (SMJ) and IR64 under well water and drought conditions. Root pouch and root box system were utilized to finely map the dynamics of shoot and root growth at seedling and tillering stages. In root pouch system, the results showed that SMJ, an upland rice, had the highest elongation rate of the primary and the first whorl crown roots, but the elongation rate of the subsequent whorls were significantly reduced compared to KDML105 and IR64. In root box system, drought significantly decreased shoot dry weight of IR64, KDML105 and SMJ by 56.76, 75.14 and 61.83%, respectively. Crown root development, particularly, crown root number was significantly decreased by more than 80% in all rice varieties under drought. One week after exposed to drought, KDML105 and SMJ reduced primary root growth rate by 21% and 31% respectively, while IR64 significantly increased primary root growth rate by 5%, especially, at 20-40 cm soil depth. Among the three varieties, SMJ had the deepest root system under drought. Moreover, SML significantly reduced xylem vessel areas but maintained the number of xylem vessels while KDML105 and IR64 drastically reduced number

of xylem vessels. These characters may contribute to drought tolerance in SMJ variety. Our study indicates that growth dynamics and responses of rice roots to drought vary among rice varieties and root classes.

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