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Development of Root System in Rice Based on Formation of Phytomers : An analysis on varietal difference in root length and weight in a pot experiment

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Abstract:

Because the framework of a root system in rice consists of nodal roots which emerge from the stem part of the phytomers, the number and size of the phytomers could affect the morphology of the root system. Three rice cultivars, IR36, Lemont and Koshihikari were grown in pots for 60 days, and the total number of phytomers per plant and mean size of the phytomers were developmentally calculated from the total number of leaves and shoot dry weight. The total root length, total root weight and their components, namely the number and 'mean length' of the nodal roots, were also measured. The total root length and total root weight increased exponentially with time and linearly with the increase of the number of phytomers, while the coefficients of linear lines differed among the cultivars. There seemed to be a common, intimate positive correlation between the number of phytomers and number of nodal roots among the three cultivars, and also between the size of the phytomers and 'mean length' of the nodal roots. These results suggest that the varietal difference in the number and size of phytomers could explain the difference in the root morphology of rice cultivars.

Keywords:

Nodal roots, *Oryza sativa* L., Phytomer, Rice, Root length, Root system, Root weight, Varietal difference

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