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[\[Full-text PDF \(1433K\) \]](#) [\[References \]](#)**Comparison of Root Systems among Rice Cultivars by Simplified Investigation Methods**

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Abstract:

Simplified investigation methods of root systems in Japanese and American rice cultivars were examined using photographic recording methods and image analysis on a personal computer. In order to photograph flat expanded root systems, plastic boards were inserted vertically into the soil and culture boxes before seeding or planting in each experiment. Each root system profile picture was divided into parts every 5cm from the plant and at an angle of 22.5° from the horizontal. The 'center of root system gravity' [CRSG : integrated (PV×RPA)/the sum of RPA]] and 'moment of root system' [MRS : integrated (PV×RPA)] were calculated as indicators of root distribution using the 'position value' (PV : the distance×the angle) and the 'root projection area' (RPA) in each part. In field experiments, cultivar differences in root system profiles were revealed easily, and all American cultivars except New bonnet showed a tendency of deep distribution and large root quantity (CRSG : Lemont > New bonnet ≧ M - 401 > M - 7 ≧ Ishikari > Nipponbare > Tsukino hikari ≧ Nakateshinsenbon, MRS : M-401 > M- 7 > Lemont ≧ Nipponbare > Nakateshinsenbon ≧ Tsukino hikari ≧ New bonnet ≧ Ishikari). In large root box experiments, it was possible to obtain the values of CRSG and MRS similar to those obtained in the field experiments ; however, it was difficult to evaluate numerous cultivars owing to the high cost of root boxes and troublesome management. In small plastic root boxes and water culture experiments, it was not possible to obtain accurate values for them.

Keywords:

Cultivar difference, Lodging tolerance, Rice, Root distribution, Root profile, Root projection area, Simplified investigation method

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