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## Japanese journal of crop science

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#### Analyses of the Vertical Distribution of Roots in Wheat, Soybean and Rice in Tilled and Non-tilled Multipurpose Paddy Fields

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#### Abstract:

Wheat and soybean were grown in an upland field converted from a paddy of gray lowland soil in Ibaraki, Japan in 1994-1995. Wheat and rice were also grown in multipurpose paddy fields of peat soil in 1995-1996. Non-tilled and tilled plots were prepared and wheat was sown in autumn. Soil monoliths, 30 cm in width, 5 cm in thickness and 30 cm in depth, were sampled during the late growth stages of the crops. The soil monoliths were divided into 5 cm cubes. Roots were washed and cleaned with water, and lengths measured with a root length scanner. Root length density of 0-5 cm in the depth layer was large in non-tilled fields of soybean and rice. Wheat in the non-tilled field had a smaller root length than that in the tilled field. Root length density of 5-15 cm in the depth layer was relatively small in the non-tilled wheat field. The root depth index (RDI), which showed mean root depth in a root system, was calculated from these data. The RDI of soybean and rice was small for the non-tilled field and large for the tilled field. However, the RDI of wheat was almost the same in both non-tilled and tilled fields. It may be caused by small amount of precipitation in winter.

#### Keywords:

Direct sowing, Distribution of roots, Non-tilled cultivation, Rice, Root depth index (RDI), Soybean, Wheat

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