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Root System Morphology of Pepper and Melon at Harvest Stage Grown with Drip Irrigation under Desert Conditions in Baja California, Mexico

Shigenori MORITA and Masanori TOYOTA
1) Univ. of Tokyo
2) Kagawa University

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Abstract:
An international project between the Japanese and Mexican governments on crop production is being conducted in Guerrero Negro, Baja California, Mexico. The objective of the project is to establish a production system for vegetables and fruits with drip irrigation in the desert. The root system morphologies of pepper and melon at the harvest stage were examined as one way of obtaining the goal. The root length density of pepper decreased with soil depth and repidly so below 20cm, while horizontal variation in the root distribution was relatively small. The roots of ridge-cultured melon were distributed mainly on a ridge, Many lateral roots had tumors possibly damaged by nematode. The root length densities at several coressponding sites and depth of both sides of the pepper row were statistically different depending on being with or without emitter. However, there was no significant difference in the root length densities of both sides of the melon row, although the spatial distribution of roots was apparently asymmetric. This asymmetric disribution of roots in soil may be affected by drip irrigation including the influence of fertilizers in irrigation water from the emitter. At the same time, a preliminary observation suggested that an increase in root length density was caused by accelerated root branching, depending mainly on an increase in length of lateral roots.

Keywords:
Capsium annuum L., Cucumis melo L., Desert, Drip irrigation, Mexico, Root system

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