

EFFECT OF DRIP IRRIGATION AND FERTILIZATION ON TOMATO ROOTING PATTERNS

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Abstract:

Tomato rooting patterns, root length density (cm/cm^3) and root length intensity (cm/cm^2), were evaluated in a field trial with pot transplanted plants where three irrigation regimes (0.5, 0.7 and 1 ETm) and three nitrogen application levels: 50, 150 and 250 kg N/ha as Ca $(\text{NO}_3)_2$ were imposed. Root length was measured from soil-root samples taken with a hand auger, at three distances across the planting row (over the plant row, at 15 cm and 37.5 cm distance from the plant row) and on three dates during the growing season (34, 72 and 105 days after planting). Root length was recorded as root length density, RLD, cm/cm^3 and total root length per unit of soil surface area, RLI, cm/cm^2 . Yield and °Brix were estimated when about 80% of the fruits were red or orange. Irrigation and fertilization only in some occasions, locations and depths, had a significant effect on root length density. For all the sampling dates in the location over the plant row about 63 to 78 % of root length was concentrated in the top 10 cm of the soil profile. The results show that water applied increased significantly lateral root growth. Root length intensity in function of distance to the plant row was modelled for the three sampling dates. The soluble solid yield was greater in the treatment where the level of water applied was the highest. Differences found on commercial yield and °Brix between fertilization treatments were not significant