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**EFFECTS OF NUTRIENT SOLUTION CONDUCTIVITY
ON YIELD AND QUALITY OF TOMATO (*Lycopersicon
esculentum* Mill) GROWN WITH NFT**

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ABSTRACT

The effects of electrical conductivity (EC) of nutrient solution on yield and some quality characteristics of tomato (*Lycopersicon esculentum* Mill) were studied. Two fresh market tomato cultivars, Concordia (a long shelf life cultivar) and Rondello (a standard greenhouse tomato) were grown in a greenhouse with NFT at four EC levels of nutrient solution (2.0, 4.0, 6.0, and 8.0 mScm⁻¹). Two experiments were conducted, one in the summer and the other in the winter. Increasing EC significantly improved fruit quality in terms of total soluble solids (TSS), titratable acidity (TA) and dry matter concentration (% DM) in both experiments. Results from the taste test indicated that the changes in fruit compositions at high EC resulted in taste improvement that could be recognised by consumers. Fruit (picked at breaker stage) from plants grown at 6 and 8 mScm⁻¹ had redder skin colour on Day 3 to 11 during storage at 20 °C.

During the summer experiment, EC 6.0 and 8.0 mScm⁻¹ reduced fruit yield mainly due to a reduction in fruit size and an increase in the incidence of blossom-end rot (BER). Generally, increasing EC also decreased vegetative growth, and the effects were clearer during the summer experiment.

The effects of increasing EC levels on growth, yield and quality observed could be because increasing EC decreased water potential of nutrient solution leading to less water uptake and lower plant water status. Both plant water uptake and plant water status were found to decrease with increasing EC levels.

Results from this study showed a clear effect of season. Vegetative growth and yield were substantially lower during the winter experiment. The effect of increasing EC levels on fruit quality (fruit compositions and taste) was significant during both experiments, but their effect on yield was significant only during the summer experiment.

In general, both cultivars responded to EC levels similarly in terms of vegetative growth, yield and fruit quality except that Rondello was much more susceptible to BER at EC

higher than 4 mScm⁻¹ during the summer experiment.

The levels of EC used in this study had no effect on time of maturity but Rondello appeared to mature slightly earlier than Concordia. The levels of EC used in this study did not have any effect on rate of water loss of the fruit during storage at 20 °C but Concordia had higher rate of water loss than Rondello.

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GLOSSARY OF ABBREVIATIONS

ANOVA	- Analysis of variance
BER	- Blossom-end rot
CV	- Cultivar
DM	- Dry matter concentration
EC	- Electrical conductivity
H	- Hue angle (°)
L	- Lightness (%)
MPa	- Mega Pascal (1 MPa = 10 bars)
mS	- Milliseimens
NFT	- Nutrient film technique
RCBD	- Randomized complete block design
RH	- Relative humidity (%)
RWC	- Relative water content
SEM	- Standard error of the mean
TA	- Titratable acidity (% citric acid)
TSS	- Total soluble solids
Ψ	- Leaf water potential