Optimization of Long Distance Transportation Conditions for High Quality Tomato Seedlings: Effects of Air Temperature and Light inside Trailers

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Increasing numbers of vegetable growers purchase their transplants from specialized transplant producers. Possible deterioration of transplants during transportation limits the market size as well as the potential sources of high quality transplants. To determine best conditions for transportation of seedlings, tomato (*Lycopersicon esculentum*; ‘Durinta’) seedlings with visible flower buds were placed for 4 days under varied air temperature (6, 12, or the conventional transportation temperature of 18°C) and light intensity (0 (conventional darkness) or dim light at 12 μmol m⁻² s⁻¹ PAR). Plants were evaluated for visual quality, photosynthetic capacity, growth and ultimately fruit yield. Lower temperatures and illumination significantly maintained visual quality of the seedlings. Lower temperature maintained high photosynthetic capacity of the seedlings during transportation. Growth and development of the seedlings were significantly affected by higher temperature resulting in significantly delayed growth and development. Number of fruits set on the first truss was significantly reduced when seedlings were at 18°C during transportation. Overall, simulated transport at 6°C under light showed the best transportability without experiencing negative impact for the 4-day simulated transportation. Seedlings at 6°C in darkness and at 12°C under light and in darkness also showed satisfactory transportability. Seedlings at 18°C exhibited serious quality deterioration of seedlings, delay in early growth and development, loss of flower buds on the first truss and yield reduction, which agrees with the fact that conventional transportation is currently able to be no longer than 3-days in duration.