Short-term Storage of Grafted Vegetable Seedlings

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Vegetable grafting requires a labor intensive propagation process. The short-term storage technique for vegetable seedlings can be used for adjusting production schedule as well as mitigating the peak labor demand. Yet storability of grafted vegetable seedlings is not well known. Two-phased study was conducted at the University of Arizona Controlled Environment Agriculture Center (Tucson, AZ). Phase I study was to test low temperature tolerance (5, 10 or 12°C) of selected 22 scion and rootstock cultivars of Solanaceae and Cucurbitaceae. Photosynthetic photon flux (PPF) of 2, 5, and 12 □mol m^{-2} s^{-1} was selected to achieve approximate light compensation point at 5, 10, or 12°C air temperature respectively. Seedlings kept their visual quality and post-storage growth potential when stored at 10°C for Solanaceae and 12°C for Cucurbitacea with some exceptions (eggplant and watermelon). The Phase II study was to evaluate the effect of scion and rootstock combinations on the storability of grafted seedlings. Watermelon, the most sensitive species to low-temperature, was used as the scion to graft onto interspecific hybrid squash, bottle gourd, watermelon, or non-grafted. It was determined that squash and bottle gourd rootstocks conferred chilling tolerance during storage to watermelon scions, making the grafted plants storable for 2 weeks without negative impact to post-storage growth and development. The use of 2-week storage potentially reduces the weekly grafting labor demand by at least 66% when effectively used in the production schedule.