Harvested bunch tomatoes are sensitive to fruit abscission and desiccation of calyces, which limit product marketability. Our investigation showed that tomato fruit bunches when submitted to a combination of temperature, aqueous solutions and storage time, fruit abscission, and calyx desiccation can be prevented. The loss of fruit weight, the force required to separate the fruit from the calyces, the respiration rate and ethylene production of the calyces, the color of the calyces, and the wilting and desiccation of the calyces were measured. These results demonstrated that treatment of bunches with supplemented mineral water delays fruit abscission and calyx desiccation and improves the fresh appearance of calyces during storage.