

Title Improved airflow method and packaging system for forced-air cooling of strawberries
Author M.J. Ferrua and R.P. Singh
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Abstract

The package system designs currently used by the strawberry industry are largely based on empirical techniques and have limited the efficiency of forced-air cooling applications. In this study, a new system capable of promoting a more uniform and energy-efficient cooling was developed. The design of this new system was based on a series of numerically based guidelines (previously developed by using a validated CFD model of the process) and involved not only the design of individual clamshells and trays, but also the overall circulation of the airflow across the palletized structure. The improved performance of the system was experimentally assessed. For the same airflow conditions, the new design significantly improved the uniformity and energy-efficiency of the process, while replicating of the cooling rate of commercial designs. In particular, no significant differences were found among the cooling rates of individual clamshells, and the pressure drop across the system was decreased by 70%.