

1993-1994 FINAL PROGRESS REPORT

Project No: 141

Title: Evaluation of PFT and Delwiche Non-destructive Firmness Sensors

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Accomplishments:

1. Evaluation of three non-destructive firmness testers (USDA, Beltsville; PFT; and Delwiche) was initiated in September 1992. Five fruit sizes (128, 125, 113, 100 and 80, three boxes for each size of both 'Delicious' and 'Golden Delicious' were obtained from three warehouses. One box of fruit from each size, warehouse and cultivar was evaluated immediately after receipt. The remaining fruit was evaluated after two and four months of cold storage. At each evaluation 40 fruit were removed from each sample. Twenty fruit were evaluated 24 hours after removal from cold storage and 20 fruit were evaluated after 14 days at 68°F at the 0 time evaluation and after seven days for the two and four month evaluation.
2. Evaluation of the USDA, Brown non-destructive firmness tester was initiated in November 1992 (machine did not arrive at the prearranged date to be included with the three original firmness testers. The same protocol as above was initiated for the USDA, Brown firmness tester.

Results:

Values obtained using the USDA (Beltsville), PFT and Delwiche non-destructive firmness testers were compared to Magness-Taylor values and core-crush test. Correlations between firmness procedures were conducted. Correlation values between destructive (MT) and non-destructive (PFT and USDA) were not acceptable. Acceptable correlations were obtained between destructive (MT) and the Delwiche firmness tester. The Delwiche firmness tester in its present form (2nd edition) cannot be considered non-destructive. When used in 'Delicious' and 'Golden Delicious' apples the Delwiche tester left a visible bruise. All data was lost, due to operator error, using the USDA (Brown) non-destructive firmness tester.

Publications:

Pitts, M., R. Cavaliere and S. Drake. 1993. Apple firmness sensor update. Proc. Washington Tree Fruit Postharvest Conf. 9:75-78.