PROJECT NO: 1233 Termination Report

TITLE: Postharvest Practices Influence Cherry Quality

YEAR INITIATED: 1987 **CURRENT YEAR:** 1992
TERMINATION YEAR: 1991

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JUSTIFICATION:

Washington State is the largest producer of fresh market cherries in the USA. They are marketed throughout the USA and the world. Exports during the last eight years have averaged 8% of the total crop with Asian countries buying significant amounts. Current (1990) marketing demographics show a rapid rise in shipments by air to the United Kingdom.

Postharvest studies have shown the importance of rapid cooling for quality retention. Packinghouse practices have improved over the past three years, partially as a result of information gained from this study as well as increased importance of sales to the Pacific Rim countries. Protection from deterioration in transit is extremely important if consumers are to enjoy crisp, sweet, firm, large cherries.

OBJECTIVES:

1. Determine what changes are necessary in handling, temperature management and other practices which, compared to conventional handling, will result in improved quality of cherries in the marketplace.

2. Extend the shelf life of cherries through the use of controlled atmospheres obtained with oxygen and carbon dioxide semipermeable films and modified atmosphere packaging.

PROGRESS:

1. Lighting Study. One of the most difficult aspects of packing cherries is sorting out off-color cherries. Lighting affects the ability of sorters to discern brown from red.

In the warehouses, lighting on the sorting tables differs in both spectrum and intensity. A series of laboratory trials was undertaken over a three-year period to compare the effects of spectrum, intensity and background color on the ability to sort cherries. A dozen different fluorescent bulbs were compared. When natural daylight is used as a standard, cherries viewed under Vitalite bulbs appeared darker in color and with more pitting than if the same cherries were inspected under natural

light. Excella, Cool White, D50, D30 and D4 100 were about the same as natural light. Cherries sorted under Incandescent fluorescent, Lite White, Daylight and Warm White bulbs were more difficult to sort. A complete report will be distributed at the Cherry Research Review.

2. Modified Atmosphere Trials. Trials were undertaken during the past three cherry seasons to evaluate the possibility that Modified Atmosphere Packaging (MAP) of sweet cherries would be superior to current commercial practices. Film wraps of various densities and injections of various atmospheres were tested.

Although the treatments were effective in modifying the atmospheres, skin and stem color, firmness, soluble solids, acidity, pitting, bruising and browning were not greatly improved by any treatment.

Work in 1991 tested whether MAP at the rates tested affected the rate of decay. Cherries were sprayed with a spore solution of Penicillium, Botrytis and Alternaria prior to MAP treatment. The results of these tests will be presented at the Cherry Research Review.

3. Cherry Quality as Affected by Box Type. In 1991 an extensive study was made to determine whether the quality of cherries upon arrival in distant markets would be affected by the shipping container. A series of trials was set up to compare the suitability of using expanded polystyrene (EPS) containers with the commonly used fiberboard carton (FC).

The trials included determining the steady state atmosphere established within the EPS container and whether this atmosphere would be detrimental to cherries over a three-week period. It was determined in both laboratory and commercial trials that the containers are sufficiently permeable. The atmospheres established were lower in oxygen and higher in carbon dioxide but not sufficient to cause concern.

When the EPS, FC and aluminum bubble-wrapped cartons were exposed to varying temperature regimes it was determined that cold fruit remained colder in the EPS container than in the others. Fruit in the aluminum bubble-wrapped container remained colder than in the FC. Air shipments from New Zealand to Wenatchee showed that the EPS was a viable alternative to the FC. A written report of this work will also be presented at the Cherry Research Review.

DURATION OF BASE PROJECT: December 1, 1991

COMMODITIES AFFECTED: 100% cherries

BUDGET:

This project was funded at $12,100 in 1990 and at $9,725 in 1991. No funds are requested for 1992.