COMPARISON OF ALTERNATIVE QUARANTINE TREATMENTS FOR SWEET CHERRIES

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Introduction

Approximately 30% of the sweet cherry crop from the Pacific Northwest is exported to Japan. These exports result in over 70% of the profit realized from the cherry crop. At present, these exports must be fumigated with methyl bromide to control codling moth (Cydia pomonella L.), a pest of quarantine concern to Japan. With the impending loss of methyl bromide, alternative treatments must be developed to maintain the current export markets for sweet cherries. We have been in the process of developing alternative treatments for sweet cherries. This past season (1997) we performed a demonstration study for the Washington state cherry industry in which we compared traditional methyl bromide fumigation against irradiation, high temperature/controlled atmosphere treatments, and microwave. The results of codling moth larval mortality, fruit quality, and a taste test will be discussed.

Irradiation:
Cherries were irradiated at 300 Gy at the New Horizons Technologies, Inc. in Richland, WA using a Co^{60} source irradiator. Fruit quality tests indicated no significant loss of quality as compared to controls. Irradiated 3rd instar codling moth in cherries did not develop into pupae. However, some irradiated larvae did live for more than 2 month following treatment.

High temperature + Controlled Atmosphere:
CATTS (Controlled Atmosphere Temperature Treatment System) was used to treat cherries at either 45 or 47˚C at 1% O_2, 15% CO_2 under vapor forced air conditions for either 45 or 25 min respectively. Fruit quality was acceptable for up to 2 weeks following treatment. Codling moth mortality was 100% for the 45˚C/45 min treatment and 100% for a 47˚C/25 min treatment.

Microwave:
A research-scale 915 Hz microwave unit at Washington State University was used to treat sweet cherries. A power of 1 kW for 1, 2, and 3 min was tested. Fruit quality was not acceptable for any of the three treatments. Insect mortality was near 97% for the 2 and 3 min treatments. Considerable work on the focusing of the microwaves needs to be performed before this technology would produce fruit of acceptable quality.

Treated Bing and Rainier varieties of sweet cherries were presented to the Washington Tree Fruit Research Commission at the annual Postharvest Review in Yakima, WA in July 1997. A evaluation sheet which assessed overall quality was filled out by participants. No differences between the MeBr, irradiated, or the two CATTS treatments were detected.