

LENTICEL DISORDERS INDUSTRY SURVEY

Ines Hanrahan, Ph.D.

Project manager

Washington Tree Fruit Research Commission (WTFRC)

128 N. 2nd St., Rm. 233

Yakima, WA, 98901

Ines.Hanrahan@co.yakima.wa.us

My research brings new focus from the Washington Tree Fruit Research Commission internal program to postharvest aspects of tree fruit production, with particular emphasis on superficial skin disorders (SSD). These include, but are not limited to, lenticel breakdown (LB) and lenticel blotch pit (LBP).

Lenticel-related disorders have become a concern for most growers and packers in Washington. In a preliminary survey during the 2005/06 storage season, I found that more than half of the packers contacted reported lenticel-related problems. Varieties most affected included Gala and Fuji. Generally speaking, two different disorders can affect fruit after harvest; LBP often appears as hard, asymmetric, brown patches near the calyx or on sun-exposed sides of the fruit. Flesh browning is deeper in fruit tissue (i.e., bitter pit or “Jonathan Spot”) and will likely increase in storage. Hastening ripening will exacerbate symptoms.

LB appears as round pitting centered on a lenticel. It often occurs on shaded sides or color margins of fruit. Early symptoms are like small dimples; as flesh firmness decreases, pits usually grow in depth and diameter and may coalesce. Aside from occasional shallow cavities beneath pits, flesh tissue is not significantly affected. LB usually appears after fruit has been stored, waxed and packed, although no evidence suggests that the packing process causes the problem. Fruit with advanced maturity at harvest that are stored too long and/or have nutritional imbalances are more prone to develop LB.

We have formed a SSD working group, consisting mostly of WSU and ARS researchers, to develop short, medium and long term research objectives and timelines addressing superficial skin disorders. One of the problems when assessing SSDs is the lack of standardized nomenclature. We are in the process of developing a matrix which can be used by researchers and industry personnel as a guide to properly assess SSDs. Further, we will attempt to utilize relational databases to connect weather data with horticultural practices and spray records. For that purpose, about 50 lots of Gala have been sampled and stored at Stemilt to determine LB susceptibility after storage.

Another focus has been to continuously test some of the hypotheses about possible preharvest factors that would make fruit more susceptible to these maladies. For the 2006 growing season, the group decided to initiate preliminary evaluations to determine if cultivar strain, rootstock, and growing region have any influence on LB development. Depending on the outcome, further collaborative studies will be initiated within the 2007 growing season.

Another preharvest aspect evaluated in 2006 has been the period within one month of harvest. Preliminary research by Dr. Eric Curry indicated that one of the factors contributing to

development of LB in storage might be desiccation pressure during this time period or while fruit is transported to the warehouse. We set up 4 trials to determine if the application of hydrophobic materials within 3 weeks of harvest would alleviate LB development after storage. Experiments included the following variables: time of application, application number, cultivar strain, site, oil type, oil concentration, as well as comparison to a material based on a natural wax. We will use the insight gained in all these evaluations to prepare more directed proposals for the coming years. Final results will not be available until the end of the storage season.