

COMPREHENSIVE RESEARCH ON PRUNES

Program Area: Prune side-cracking

Project Leader: K. Uriu

Personnel: Following on part-time: Wm. Schaefer, Mark Pepple, James Pearson.

Objectives:

- 1) Determine the mechanism and cause of and the factors involved in the side-cracking phenomenon.
- 2) Develop preventive measures.

Work in Progress: Tabulating, evaluating and summarizing several years' data as well as making plans for the 1971 season. Constructing transducer apparatus for continual fruit growth measurements.

Experiments Completed: Most of the experiments are of a continuing nature. However, shading experiments to determine the period during which prunes become potentially susceptible to cracking have been completed. Also, preliminary experiments on the effect of certain growth regulators on cracking have more or less been completed.

Work Planned:

- 1) Study in detail the relationship of temperature, humidity, dew, fruit expansion and contraction, internal water potential and uptake of water to the side-cracking phenomenon. These studies will be made during the entire growing season but will be concentrated during the cracking period. The objective is to find out the most important factor or factors leading to cracking.
- 2) Trials to reduce cracking.
 - a) Use of NAA and possibly other growth regulators that may change the elasticity of the prune skin.
 - b) Use of some waxy material (e.g. antitranspirants) to prevent possible uptake of external moisture through the fruit skin.
 - c) Increase night temperature of the fruit during the cracking period by employing a wind machine or heating.

Major Accomplishments: Have learned much about the nature of and the mechanism involved in prune cracking.

Shading experiments showed that shaking fruits the entire growing season nearly prevented cracking. Shading for short periods reduced cracking in all cases but the best reduction was obtained when the fruits were shaded during the cracking period.

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Study of the elastic modulus of the prune skin showed that the force necessary to break the skin decreases rapidly at the beginning of the cracking period. This change alone may allow the prunes to crack. The stretchability of the skin remains unchanged until midway into the cracking period at which time the stretchability begins to increase rapidly. This may account for the decrease and the ultimate cessation of cracking within a short time thereafter.

Cracking takes places during the early morning hours. Low temperature and high humidity are positively correlated with the amount of cracking that occurs during this time.

Evaluation of Project: The results obtained so far have been very encouraging--the information on the how and why of prune cracking has been developed in a step-wise fashion. Although it is still necessary to look into the phenomenon in detail for better understanding, we are now in a position to actually test some ideas on prevention.

Publications or Reports: Annual reports on progress have been made on Prune Days.