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COMPREHENSIVE RESEARCH ON PRUNES

PROGRAM AREA: Fruit Production and Quality

PROJECT: Crop Control

PROJECT LEADER: D. E. Ramos

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OBJECTIVES:

1. To evaluate the growth regulator ethephon for chemical thinning of prunes. At least five years of data are needed to have minimum information on chemical concentration, timing, and variability of response as affected by environmental conditions.

2. To measure the influence of bloom development and honeybee density on fruit set and harvest yield and size.

3. To determine the feasibility of predicting harvest size from measurements made at definite stages of fruit development early in the season. This information would be valuable in establishing thinning needs and in crop forecasting.

4. To compare mechanical topping with hand pruning in yield, fruit size, and cost. Data must be obtained over several years to determine cummulative effects of the treatments.

WORK IN PROGRESS:

1. The chemical thinning study was initiated in 1971 and will continue at least two more years in the three locations (Sutter-Yuba, Tulare, Santa Clara).

2. The location of the anthers in relation to the stigma of prune blossoms is being observed in a large number of Sacramento Valley orchards over several seasons to determine if blossom development influences fruit set.

3. Measurements were made of prune fruit size at two stages of development early in the season to determine if they can be used to predict final fruit size. Orchards were selected in Santa Clara and Tulare Counties and in the Sacramento Valley for the test. Correlations between these early sizes and harvest size (fresh and dry) are now being determined.

4. A mechanical topping trial was established in Tulare County in the spring of 1973. Topping reduced dry tonnage approximately 12% and increased dry count per pound and soluble solids in the first season. This test is being continued to gather data on the effects of repeated topping of prune trees.

EXPERIMENTS COMPLETED:

1. Foliar sprays of ethephon were applied at 50, 100, and 150 ppm to French prune at petal fall and around 9.0 mm seed length. Desired fruit thinning occurred with concentrations of 50 to 100 ppm within three to four weeks following treatment. These treatments induced increases in fruit size and soluble solids while dry tonnage was decreased. No phytotoxic effects were noted from ethephon treatments.

2. A survey was conducted to determine the influence of rented honeybees and wild honeybees on prune set and production. Twenty-nine orchards in Tulare County were used for the test. Measurements were made on percent set, bee activity and density at different times of the day, and distance from hives. Correlations between these factors will be made and the information presented to prune growers.

WORK PLANNED:

The ethephon trials will be continued at the three locations (Sutter, Santa Clara, Tulare counties) to refine the information on usage and to gain more experience with the chemical. An attempt will be made to relate changes in average dry prune count as a result of thinning to the distribution of the dry sizes. This may provide a more meaningful measure of the effects of thinning.

Plans for continuing the harvest size prediction study will depend upon the results of the regression analyses of the data now being performed. If the correlations appear promising, this project will be expanded.

MAJOR ACCOMPLISHMENTS AND IMMEDIATELY APPLICABLE RESEARCH RESULTS:

The growth regulator ethephon continues to offer considerable promise as a chemical thinner because of (1) good performance, (2) wide range of timing extending from bloom until pit hardening, (3) low cost, and (4) ease of FDA registration.

Mechanical thinning procedures which were developed as a part of this project have been effectively used by some prune growers and are available for expanded usage if needed.

EVALUATION OF PROJECT:

There remains a critical need to increase our ability to control the size of crop and reduce the proportion of small prunes. Effective thinning procedures, including a method of predicting potential harvest sizes, appears to be more desirable than the elimination of undersized prunes at harvest.

PUBLICATIONS OR REPORTS:

1. A paper entitled, "Thinning prune with (2-chloroethyl) phosphonic acid" (ethephon) has been prepared for publication in the Journal of the American Society for Horticultural Science.

2. A progress report of the various facets of this project will be presented at Prune Day, March 2, 1974, UCD.