CROP CONTROL*

Objectives:

To promote increased fruit size and more regular cropping, and to develop an accurate method for prediction of prune size and yield at harvest.

Results and Conclusions:

Foliar sprays of ethephon applied around 8mm seed length continue to look promising for chemical thinning. The rate of 50 ppm consistently has done a commercially-acceptable job in Tulare County. In the Sacramento Valley, however, the effect has been more variable. A 100 to 150 ppm spray looked about right in 1972 and 1973, but was excessive in 1974 when applied in an orchard different from that used the previous two seasons. In Gilroy (one orchard only), 50 ppm also has resulted in overthinning for two years. These varied results suggest there is a tree vigor factor influencing ethephon activity and the amount of fruit thinning obtained. There is need to be able to measure this fruit strength, or sensitivity, before ethephon is applied, and this will be investigated in 1975.

Mechanical tree topping (alone) has been compared with hand pruning and hand pruning plus topping during the past two seasons in Tulare County. There has been no difference in fruit quality, but there was a 13 percent yield reduction in the second year where hand pruning and topping was performed on the same trees. Topping alone cost about 15 cents per tree, topping plus hand pruning 50 cents per tree, and hand pruning alone cost 90 cents per tree. The effect of repeated topping--with or without hand pruning--over several years, must be determined before this practice can be recommended.

The fruit size prediction graph line results for Tulare and Tehama Counties were identical in 1973 and 1974. This means that measurement looks good in these districts. In the lower Sacramento Valley and in the Santa Clara district, the 1973 relationships did not hold in 1974. A few orchards with differences in fruit-sizing ability seem to have made the difference. It appears necessary to categorize orchards of wider variability into more uniform groups according to fruit-sizing potential. Potassium status of the trees may play a key role in establishing such a classification.

(cont'd)

---

*This work consists of four project areas under the crop control research program and was done by David E. Ramos, Extension Pomologist, UC Davis, coordinator; and co-leaders, G. F. Carnill, Farm Advisor, San Benito-Santa Clara Counties; L. B. Fitch, Farm Advisor, Sutter-Yuba Counties; G. C. Martin, Pomologist, UC Davis; W. H. Olson, Farm Advisor, Butte County; Joseph Osgood, Farm Advisor, Tehama County; G. S. Sibbett, Farm Advisor, Tulare County; and S. A. Weinbaum, Pomologist, UC Davis.

Variable results were obtained with both ethephon and Alar used to advance prune maturity. These chemicals induce earlier softening of prunes but do not increase the accumulation of soluble solids. Thus, their value is questionable and this work has been discontinued. Efforts, instead, should be in development of new, early varieties that can lengthen the harvest season.

Work Planned:

1. An attempt will be made to monitor blossom vigor and fruit strength as a possible measure of fruit-thinning sensitivity of prunes to ethephon. Spray thinning trials will be conducted in selected lower Sacramento Valley orchards of varying vigor status.

2. The long-term ethephon thinning trial in Tulare County will be continued to determine the effects (economic and biological) of repeated ethephon treatment.

3. A test will be conducted with a promising chemical thinner from CIBA-GEIGY. It is a more rapidly-releasing ethylene compound and may be less affected by varying tree vigor conditions.

4. The mechanical tree topping experiment in Tulare County will be continued. In addition, another trial will be established to compare the effect of summer-topping of vigorous shoot growth. This growth competes with fruit growth; removing these carbohydrate "sinks" conceivably could result in increased fruit size.

5. The reference date orchards used in the lower Sacramento Valley will be reviewed again and segregated according to various orchard conditions to see if the predictability ofthe 1974 harvest fruit size could have been improved. The findings--hopefully--will be applicable in 1975 size prediction work.

6. In Tulare and Tehama Counties, where sizing relationships have been good, we will test the use of the reference date size prediction information in crop forecasting. The assumption is that fruit size and crop size in a given orchard is highly correlated.

7. Trials will be conducted to evaluate the use of potassium nitrate sprays to increase fruit size. The tests will be conducted in orchards of varying K status to determine if a size response is obtainable even where potassium does not appear to be lacking.