

Agricultural Extension Activities in Prunes
A Partial Resume

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Approximately 25 members of the staff of the University of California Agricultural Extension Service annually devote close to 500 man-days in project work involving prunes. There are 40 some projects covering all phases of prune production, handling and quality control. Many of these projects are conducted in cooperation with members of the research staff of the various departments of the College of Agriculture and Environmental Sciences.

This report, while not complete, summarizes recent field work dealing with varieties, certain aspects of tree nutrition, chemical fruit thinning, fruit maturity, tree fruitfulness and irrigation.

Varities

At present 95% of all prune trees in California are the French variety. A few years ago Dr. Omund Lilliland and Professor Carl Hanson obtained trees and scion wood of a number of prune selections from France. Field trials were established in several prune districts with a replicated trial in Colusa County under the direction of Tom Aldrich, Farm Advisor. The selections, 707, 626, and 698 have fruited for two years, 1969 being their 5th leaf. The 1969 yields and dry-away are presented as follows:

Prune Variety Evaluation

Selection	Yield/Acre lbs	Dry-away
707	747	3:10
698	591	2:51
626	634	2:96

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The selection, 707, has also looked promising in other trials throughout the State. It bears watching since it matures about with French, seems to be self fruitful, attains good size. It does have a fairly tough skin.

Tree Nutrition

Two farm advisors, David Chaney of Sutter County and Floyd Perry of Butte County, are cooperating with Dr. Robert Carlson of the Department of Pomology in tests designed to make potassium more readily available to prune trees. The basic work was done by Dr. Carlson under laboratory conditions in which various types of soil structure were simulated. Essentially he found that by adding gypsum to the potassium fertilizer, potassium moved much more readily into the soil than when applied alone. Field tests in both Sutter and Butte County were set up this past year. It is too early at this time to determine the effectiveness of the treatments. This work, is however, continuing.

Potassium nitrate sprays applied in late spring were found to be very effective in preventing excessive dieback on heavily cropped trees. This work was carried out by Dr. Lilleland in cooperation with farm advisors in the Sacramento Valley area. It has proved so successful that this year it was suggested to growers on a limited trial basis.

Chemical Thinning of Prunes

For several years Jim Beutel, Extension Pomologist, has been running chemical thinning trials in clingstone peaches, apricots, nectarines and free-stone peaches with Naphthalene propionic acid (NPA) and chloro propionic acid (CPA and 3-CP). This past year, extensive field trials were conducted in Sutter and in Tulare County testing these materials as potential prune fruit

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thinners. Both concentration and timing of the materials were studied. The results of the Tulare County work were somewhat disappointing in that it was apparently necessary to over thin the trees in order to get any increase at all in fruit size at harvest time. Essentially the same results were obtained in the two locations in Sutter County. In addition, some phytotoxicity symptoms were noted, particularly in one orchard. Prune set, however, was erratic throughout the entire Sacramento Valley this past season and may have had some effect on these results. These studies are continuing.

Effect of Growth Regulators on Pre-harvest Crop and Prune Maturity

With the advent of mechanical harvesting, the Coastal prune districts particularly, the Santa Clara Valley have been at a disadvantage to the Sacramento Valley since the coastal climate induces formation of the abscission layer as the fruit matures and it drops naturally to the ground. It has been extremely difficult to adapt efficiently to the shake-catch method of prune harvesting which has been eminently successful in the Sacramento Valley area. Previous tests conducted by Pomology research and Extension has shown considerable promise with such materials as 2,4-D and 2,4,5-Tp, 2,4,5-T. However, Pure Food and Drug will not permit registration without a finite tolerance. More recently these chemicals have come under very careful scrutiny as to their possible carcinogenic effects. There is little possibility that they can ever be used. Last year replicated trials were established in the Gilroy area of Santa Clara County, Healdsburg in Sonoma County and north of Yuba City in Sutter County in which we tested two other materials; Alar and Gibberellic acid. The Alar was used at a 1,000 ppm and applied on June 30 at the Gilroy location, July 2 in Sutter County and July 9 in Healdsburg.

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The Gibberellic acid was applied at 50 and 100 ppm at all three locations approximately a week apart starting at the time Alar was applied.

Neither of the two materials were effective in preventing pre-harvest drop of prunes. The Alar treatment, particularly in Santa Clara Valley had a profound effect on prune maturity. It increased the harvest date from August 22 when the unsprayed trees were harvested to August 12 when the Alar sprayed trees could have been completely and easily harvested with a shaker. This was approximately 10 days ahead of the control trees. The average harvested yield per tree treated with Alar was 170 pounds per tree contrasted to 110 pounds of fruit from the unsprayed checks. Soluble solids of the fruit from Alar trees on August 12 when normal harvest occurred for these trees was 26.8 compared to 23.0 for the checks. On August 27 when the last of the prunes from the Alar treated trees were knocked, the soluble solids averaged 28.6 compared to 24.8 for the check. A week later the soluble solids on the unsprayed check trees had reached an average of only 27.8. Dried fruit size from the Alar sprayed trees in Santa Clara County averaged 57.1 count per pound compared to 67.3 for the fruit from unsprayed checks. Similar results with Alar were observed in the other two locations, although the differences were not quite as dramatic. Additional work will be done with Alar this coming year to determine precise timing as well as concentration. Alar may be of benefit to growers who wish to spread their harvest season by spraying a portion of their orchard with this material.

Prune Tree Fruitfulness

This past summer, Sacramento Valley Farm Advisors and others sent out a questionnaire to selected prune growers in their area. These questionnaires,

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rather complex in nature, dealt with factors which might affect fruitfulness of prune trees. Bees, varieties, weather, soil, water--all factors that might have an influence on tree fruitfulness. Twenty-seven questionnaires have been returned and are in the process of analysis.

Twelve growers reported above average on heavy crops as compared to 15 whose crops were only average or below. Seven reported light crops as compared to only three who reported light crops in 1968. The questionnaires have provided the basis for future field trials to determine the manner and degree that biennial bearing may be a factor in California Prune Production.

Irrigation

Several years ago, Mr. Tom Aldrich of Colusa in cooperation with Dr. Kay Uriu of the Department of Pomology and Larry Booher of Irrigation set up field trials to determine the effect of high and low moisture availability on prune production and prune quality. This study now in its fifth year has shown some rather significant results. Trees kept constantly on the dry side in 1969 produced an average of 40 pounds of fruit per tree in contrast to 55 pounds of fruit from trees which had ample moisture available throughout the growing season. This represents a 26% increase in fruit weight over the dry treatment and a 21% increase in number of fruit. The distribution of dry fruit size was directly related to availability of moisture. The percent of prunes running 43 per pound or larger was 60% for the wet treatment as compared to only 33% for the dry treatment. A similar prune irrigation project has since been established in Tulare County.

The field research done by these farm advisors is an important contribution to the prune industry. However, dissemination of results of research work

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conducted by University research personnel as well as Extension must also be done. This is the educational aspect and indeed, is still the moving force in the purpose of the Agricultural Extension Service. Teamwork among all concerned can help ensure a successful program.