L. L. CLAYPOOL

Better Fruits

for the consumer

The various deciduous fruit industries in California are attempting to improve quality, flavor, and appearance of their products to attract more consumer dollars to their commodities.

One of the research programs associated with improvement concerns harvest maturity. The dessert quality of a peach or a plum may be greatly influenced by the maturity at which it is harvested. However, to harvest a fruit at the stage that gives highest dessert quality is not always possible, particularly if at this stage the fruit is not sufficiently sturdy to move through market channels. Continuing improvements in transportation and marketing facilities, however, have made it possible for the industry to harvest and ship fruits at a maturity stage that will more nearly result in maximum flavor quality.

Studies are being made of the physical and chemical changes that take place in fruits during maturation and the relationship of these to dessert quality, appearance, and marketability of fruits. The new fruit varieties being planted compound the problem. Some of these have such intense red surface color so far in advancement of proper maturity that the picker and shipper cannot tell when to market them. Various physical or chemical tests promise help in this situation.

The problem of maturity is confused by the constantly greater yields being produced per unit area of land. It seems that, under some conditions, at least, these tonnages have attained such magnitudes that the harvested fruit is of very poor flavor quality regardless of maturity.

A research program on fruit maturity during recent years has been helpful to both the fresh pear industry, in developing information from which maturity standards have been derived, and to the dried prune industry, in determining the proper time to harvest for best quality dried fruit. Research now underway on nectarines, freestone peaches, and plums promises to be helpful in improving the quality of products of those industries.

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Widespread

Zinc Deficiency

in California soils

Zinc deficiency has been common in citrus and other tree fruits in California for many years. More recently, it has been observed in annual field and vegetable crops. A study was set up to delineate the extent of zinc deficiency in California, and to develop means of predicting where it might occur..

Preliminary analyses of soils and plants from fields where zinc deficiency symptoms were observed indicated that zinc extracted by ammonium acetate-dithizone might be a useful measure of soil zinc available to plants. To test this method of analysis under a wide range of soil conditions in California, farm advisors cooperated in securing soils in which zinc deficiency was observed or might be expected. Chemical analyses and greenhouse assays were conducted on 50 soils, and preliminary field trials with zinc sensitive crops were established in certain locations.

In the greenhouse study, a standard procedure was developed in which sweet corn was grown in 1,600 grams of soil—6″ pots—using the five treatments in duplicate: nitrogen alone; nitrogen-potassium-phosphorus; nitrogen-potassium-phosphorus with five pounds per acre of zinc; nitrogen-potassium-phosphorus with 25 pounds per acre of zinc; nitrogen-potassium-phosphorus with 25 pounds per acre of zinc and other micronutrients. Purified chemicals were used, and the nutrient sources were: nitrogen as ammonium nitrate or ammonium sulfate; phosphorus and potassium as potassium dihydrogen phosphate; zinc and the other micronutrients as sulfates. At the pretassel stage, the plant tops were harvested, washed in acidified detergent solution, rinsed in demineralized water, dried at 158°F, weighed, ground, and analyzed for zinc by X-ray fluorescent analysis. After harvest, soil samples were taken and analyzed for zinc by the ammonium acetate-dithizone extraction method.

The extractable zinc of soils was closely related to zinc response of plants on the 50 soils studied in the greenhouse. Eighty-four percent of the soils which contained 0.55 ppm—parts per million—or less extractable zinc responded to soil applications of zinc sulfate. In contrast, 76% of the soils containing more than 0.55 ppm failed to respond to zinc applications.

Plant Uptake of Zinc

Soil-applied zinc increased the zinc concentration and total zinc uptake by plants in all soils studied. The uptake of zinc was consistently increased with increasing rates of applied zinc in both the low and high zinc soils. The total uptake of zinc by corn in the no-zinc