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AVOCADO YIELDS IN THE SAN JOAQUIN VALLEY

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The Central San Joaquin Valley is the newest area for production of avocados in California. There are now about 700 acres planted in the citrus growing areas of Fresno, Tulare and Kern Counties. Because of its cold winters and hot summers, this area is marginal for avocado production. However, because of early maturity, the San Joaquin Valley is able to supply avocados during the October-November marketing period; thus, good returns to growers have made this business very attractive.

After about a dozen years of commercial avocado production in the San Joaquín Valley area, the variety situation is still undecided. Zutanos are most widely planted, followed by bacon, Susan and others such as Nowels. The search is continuing for a variety that will have high quality, mature in October, have good market acceptance and be able to withstand the somewhat hostile summer and winter climate.

Aside from occasional severe frost damage to avocado trees in the San Joaquín Valley, probably the biggest production problem encountered is that of overcoming the erratic bearing habits of present varieties. Some orchards produce well each year, some bear little or no fruit at all, while others only occasionally set a full crop. Extensive observations have failed to pinpoint reasons and only led to further guesswork. Following is a summary list of possible causes considered as contributing to the sometimes disappointing production in many orchards.

(1) *Alternate Bearing.* Some varieties seem to exhibit natural alternate bearing habits. A heavy yield one year signals a light set the following year. This is sometimes noticeable as orchards alternate bear and in other cases individual trees within an orchard alternate bear.

(2) *Pollination.* Lack of cross pollination has been suggested as a reason for low bearing, particularly with the Bacon variety. From observations made where other varieties or seedlings (both A and B type flowers) are present within Bacon orchards, there is no consistent evidence to show that cross pollination improves bearing. The presence of bees during bloom seems to increase set, but this is difficult to demonstrate because almost all orchards have an abundance of bees at that time.

(3) *Water Availability, Application and Rates.* Adequate amounts of water must be available to trees throughout the growing season to prevent excessive fruit drop during hot, dry summer months. Frequent irrigations which maintain at least a portion of the soil surrounding the root system at or close to field capacity is necessary to minimize “June drop."

(4) *Orchard Exposure.* Trees with a southern or western exposure sometimes bear more fruit than those on a north slope, when orchards are grown in gently rolling hill areas.

Shade. Both Zutanos and Bacons are upright growers. If planted too close, lower portions of trees are shaded severely by the time they are 6 to 8 years old and fruit is produced primarily in the top third of the trees. Trees planted at distances nearly 25 feet apart bear better on lower portions than those planted 20 feet apart or closer.

Proping close planted, tall Zutano trees in the Exeter area. Most fruit is produced in the top half of these trees and limb breakage is common.

(6) *Bud Source.* Some trees within orchards do not bear consistently or perhaps do not bear at all compared to many other trees in the orchard. Could it be that bud source is responsible for this if the original buds came from a nonproductive limb or tree?

(7) *Tree Age.* Many young Bacon orchards bear very lightly until they reach 6 or 7 years when production increases. Tree age, therefore, probably is responsible for poor production during the early years in some orchards in the area.

(8) *Rootstock.* Little is known concerning effects of rootstock on bearing habits of commercial avocado varieties in the San Joaquin Valley. Rootstocks used for trees in that area have come from wide and varied sources. These sources include many seed trees, odd seedlings and Southern California seed sources, in addition to some

commercial variety seeds. Perhaps some future long-range study will show if there is a possible rootstock effect.

(9) *Girdling.* Limited observation indicates that girdling may increase Bacon yields.

(10) *Microclimate Conditions.* Of all possible causes of erratic avocado yields in the San Joaquín Valley, the effect of microclimate during and after bloom is perhaps the most important. Past studies have shown that mean daily temperatures during bloom should be about 60° F or higher for those varieties studied. Temperatures may not be sufficient in some locations at bloom time to meet this requirement. This could explain why northern or southern exposure may be a function of temperature at bloom time. Some varieties, therefore, may be more sensitive to temperatures during bloom; for example, Zutano is a more consistent producer than Bacon when planted in the same location.

The avocado business in California's San Joaquin Valley is slowly increasing and so are questions concerning bearing habits of commercial varieties now grown. For every question that arises concerning these bearing habits, many more seem to be left unanswered. Continued observations and experiments may answer some of these questions. If this small industry is to continue in the San Joaquín Valley, many of the above speculations will have to be answered to assure profitable yields in this distinctly different area.