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Bearing Cycles of the Avocado

R. W. HODGSON
Avocado Institute, La Habra, October 18, 1946

Alternate bearing in the avocado, particularly the Fuerte variety, was traced over a 20-year course at the avocado institute held at La Habra in mid-October, by R. W. Hodgson, Dean of Agriculture at UCLA. Hodgson is recognized as a leading authority on avocado culture in the nation.

The subject is of intense interest both to the grower and to others connected with the industry because the phenomenon of "on" and "off" years results in the widely fluctuating crops characteristic of the entire industry. In addition certain inaccurate beliefs founded on this known tendency have been accepted by many growers. Among these are the assertion that the "on" year crop is always followed by the "off" year and that all Fuerte trees everywhere, without regard to planting dates, have the same "on" and "off" years.

Hodgson said that research reveals a pronounced tendency toward alternate bearing in all avocados, perhaps strongest in the Fuerte which accounts for something like 90 per cent of all commercial trees. Most other varieties exhibit the same tendency in varying degrees. It is almost as though the avocado were a two-year tree, requiring that length of time in which to bear a maximum crop and a second year in which to recover. In this recovery year the crop tends to be poor.

This tendency is well borne out by crop records of the past 20 years, but there are variations. Thus in the past 20 years, eight crops have been smaller crops than those of the preceding year, which 12 have been larger. On three occasions, a very heavy crop has been followed by two poor years, or two fair crops have proceeded the "off" year.

The speaker explained this phenomenon by the following hypothesis: There are two conditions which may be met in the "on" and "off" years, to wit, favorable weather and unfavorable weather which term certainly includes low temperatures and might also include relative humidities and/or overcast skies and other factors, including wind.

In the on-year stage favorable weather at blossom time will give a maximum crop, but if the weather is unfavorable the following crop might range from a near failure to fair production. When bloom time falls in the "off" stage, unfavorable weather then might easily bring about an almost complete failure. These combinations explain the phenomenon of two poor and two fairly good years together as well as maximum and minimum crops. However, where two poor or two pretty good crops come in succession, the cycle is definitely changed and the new cycle continues until a similar phenomenon brings a return to the original. This change has occurred three times in the past 20 years.

The major factors, of course, are what Hodgson terms favorable or unfavorable conditions and the favorable stage occurs only above a mean of 55 degrees. Conversely, unfavorable temperatures are those below this range. Impact of other factors is not yet understood but they might well include relative humidities, overcast skies and wind and, of course, frost which inevitably reduces the set of the crop when it occurs at blossom time.

The "on" year, Hodgson explained, is the season in which the tree appears to have built up the supplies necessary for maximum production. With favorable weather at some time during its extended bloom period, a full set of fruit is made and this set is carried through to maturity to make an optimum crop for the tree and soil.

The "off" year normally follows one of peak production, or two years during which production is high but, because of unfavorable weather, was never at the maximum point. It appears a necessary period in which the tree rebuilds its energies, depleted by the "on" cycle. It invariably occurs the year after a maximum crop, or in the third season after two successive good crops.

Soil structure also has an unquestionable bearing on fruit production and so does soil moisture. Too much water is recognized as exerting a deterring effect on fruit production and when soils are allowed to dry too much at any time during the year, production is sharply cut in the following crop.

Not yet fully known, the speaker said, is the part played by nitrogen in stimulating or depressing crops, but it is now believed that the requirement of this element in fertile and deep soils may be as low as one-half that of a citrus tree. This requirement, of course, rises when trees are in poor or shallow soils.

There is no evidence of failure of pollination at any time under normal California conditions, the speaker said.

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