

## How to Make the Avocado Tree Bear

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How to make the avocado tree bear and how to make it bear with profit to the orchardist may often be solved by different formulas. In the avocado growing regions of California, at least in all except those near the ocean where there is considerable cool, cloudy weather, there is a strong tendency for early and heavy production of practically all of our cultivated plants. The failure of annual farm crops and flowering plants is almost unknown, and the thinning of deciduous fruits is necessary almost every year to prevent overproduction. This tendency can hardly be accounted for by the unusual fertility of the soil compared with other regions where the same crops yield poorly or by superior methods of culture, for on the poorer soils and under neglect the same strong inclination toward heavy production prevails. As a very large part of the contents of our fruits, excluding the water, is manufactured in the green chlorophyll of the leaves and this by the aid of sunlight, the long summers of long days of uninterrupted sunshine may properly be given credit for the tendency toward early and heavy bearing of our crops. Where the fruit-making materials, elaborated by the leaves, are high in proportion to the nitrates, which are sent up from the soil by the roots, the tendency of the trees is to bear fruit. Where root pruning, girdling, driving nails into the tree, and such methods are practiced, where the soil is low in nitrogen or the water supply low during summer, as is the case with much of our cultivated lands, heavy production naturally follows, for the leaves are not molested in their work of building up fruit-making materials while there is a decrease in the supply of materials sent up by the roots. Sufficient moisture, nitrogen, and other essential elements from the soil must of course be supplied to permit of moderate leaf development. If the orchard soil is deep, open, and fertile with an abundant supply of nitrogen, a longer period will be necessary for the leaves to establish the high proportion of fruit-making materials necessary to induce fruiting than on soils where wood growth is less rapid.

The cutting back of heavily leaved branches will no doubt hinder, or delay production also, as this removes an active portion of the tree and one most heavily charged with fruit-making materials but leaves the roots unmolested in their nitrogen collecting work.

On the other hand, the use of stocks with which the budded variety is not congenial causes a stunting of growth of both root and top, thereby inducing early and heavy bearing. A few varieties, among which the Lyon is probably the best known, are noted for their poor growth but early and heavy production. The Lyon variety appears to be very incongenial with the stocks on which it is commonly worked, and the poor passage of prepared plant food from scion to stock; of minerals from stock to scion results in slow growth of the top and an accumulation of fruit-making materials, causing heavy production. Trees of the variety Murietta Green make a poor growth and are inclined to

bear heavily, for trees of their size, on stocks commonly used for them; but Mr. Spinks found that by leaving a portion of the top of a vigorous variety into which the Murietta was worked, the roots were nourished and a good growth and production of the Murietta resulted. Another variety, the Cantel, lately introduced, has been noted to be incongenial in a few cases where worked into a stock of the Mexican race. In these instances, the wood growth is lacking in vigor but production is heavy.

Could stocks be found which would make a congenial union with these varieties, thrifty vigorous trees would doubtless result, but trees which would come into bearing later and produce less in proportion to their size. But here we are getting away from the topic for this meeting, and are seeking a preventative for heavy production. These results, however, should teach us good lessons as to what induces production.

While there is much more, we might say, almost all to be learned about the problem of nutrition with the avocado, the indications are that natural climatic conditions in California favor heavy production and that practices for hastening fruiting of young trees and conditions which induce early bearing are detrimental to tree growth and unprofitable to the orchardist, unless the fruit be very high in price and the trees very vigorous. A moderate nitrogen content in the soil, moderate irrigation, and a long season of moderate tree growth should result in good production provided there is but little cutting back of the branches and the blossoms are pollinized.

Trees of some varieties are naturally more rampant in their growth than others and some probably require an unusually high concentration of fruit-making material to cause fruit to set. With such trees, drastic means to induce fruiting will be more quickly overcome by the tree than by those less vigorous; but even here applying cultural methods which will gradually retard wood growth will probably be the best course to follow in making the tree bear, especially if the trees are young.