

Permanent Cover versus Cultivation

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My subject today is "Cover Crop versus Cultivation." I believe in cultivation as a result of fourteen years of experience in San Diego County on Vista sandy loam, Fallbrook fine sandy loam, Merriam sandy loam, and what we call "dobe" (Diablo clay). I name these soils because there may be some types of soils where one would not get the same results. This question of permanent cover versus cultivation is an economic one with us, and I believe the true picture will not be complete until after several years of comparison between the two systems—let us say eight to ten years.

In comparing groves under the two systems, we have noticed a decided decline in trees and fruit grades. The following comparison is the result of one of several we have made. The figures given are for the fiscal year ended October, 1940, and are on a per acre basis. In each case the trees were of the same age, the soil was of the same type, and both groves were under the same management.

	Cultivated Orchard	Non-Cultivated Orchard
Disked	(2 times) \$ 4.32	
Fertilizer	15.92	\$24.35
Irrigation	(8 times; 1.96") 29.65	(10 times; 2.88") 57.15
Yield	3,162 Lbs.	3,274 Lbs.
Selling Price	\$7.44 Cwt.	\$6.93 Cwt.

You will note that the non-tilled orchard yielded 112 pounds more fruit, but the difference in grade showed a loss. Also, the fertilizer and water costs were greater. The difference is \$39.97 in favor of the cultivated orchard. By the use of the soil auger, we endeavored to put the water to the trees when they needed it, where they needed it, and in the amount they needed. We try to fertilize to keep trees in good vigor. As a result of our studies and experiences, we are convinced that one cannot economically raise two crops on the same ground and we know that the trees show decline considerably sooner in non-tilled orchards.

We take care of thirty different orchards and, because of conditions, we are practicing five different systems of weed destruction.

(1) Disking: The size of the acreage, the depth of the soil, and the topography control the disking, but we make an effort to do light shallow disking of all orchards, wherever possible. I wish to emphasize shallow disking because we do not believe it is necessary

to use heavy deep-cutting disks to gain the full benefits. We disk only for the destruction of weeds and the incorporation of bulky fertilizers.

(2) Hand Labor: We have several acres on which, because of size and rocky condition, we use hand tools, such as hoe, scythe, etc.

(3) Mulching: This has proved to be very expensive, because in order to shade out weed growth, it requires heavy applications of mulch, and, consequently, we do not do this where we can fight weeds otherwise.

(4) Chemicals: We have had very little experience with this and I am not enthusiastic over its possibilities because of its cost, its limitations, and the feeling that anything that will kill weeds would have a tendency to sterilize the soils, and damage the trees if it comes in contact with them. We must always be on guard against anything that will discourage bacterial action in our soils.

(5) Shading Out Growth By Trees: This has proven our most expensive way of destroying weeds, because in order to completely shade the ground, we are going to shade out all sides of our trees and throw our production into the tops of the trees, thus increasing the cost of picking, insecticide work—in fact, all of our orchard operations. We must keep our trees so spaced that we have aisles of sunlight among them and naturally these open spaces are going to produce weed growth if our ground is fertile.

My interest in comparing the two systems has been acute only in the last three years, and in referring back to the two orchards where figures were quoted, I now feel safe in saying, that the two orchards are going to show a greater difference in income, because the same ratio seems to exist under the heavy production which these orchards have shown during this crop year.

In conclusion, I would like to advise my avocado-growing friends to study their soil and conditions in the interest of an economical tillage system and make the extra (profit) they will get in longer life of trees and better economy.