

acre of plant food used by the orchard would be \$297 per acre.

In either case it is seen that an orchard used more than simply sunlight and water. From many of the mature orchards, harvest crops other than apples have been removed continuously for from 20 to 50 years, in addition to the apples harvested. Is it any wonder that many of the mature orchards are far from vigorous, shy of bearing and perfect but a small per cent of their fruit? While it is true that many of our fields still contain vast stores of plant food, it is equally true that the cream of the land has been removed and that the remaining plant food is not readily available, in other words, it is tough.

What are the conditions the fruit grower meets when he attempts to grow a young orchard? He finds that most fields have been depleted of large quantities of the most easily available plant foods. For 50 years or more, double, often three-fold, more plant food has been removed than has been returned to the soil. The soil and subsoil too have often become compacted, hard and unresponsive. The drainage channels have been obliterated and can only be restored by long tap-rooted plants or drainage. The humus so necessary for good physical condition of the surface soil and for conserving moisture and for promoting chemical and biological action is deficient or almost entirely wanting. Is it any wonder then that heroic treatment, such as J. H. Hale gives his orchards, is necessary if the young trees flourish and fruit abundantly?

Good fruit is on the average salable at remunerative prices home and abroad. When well managed, the orchard areas are by far the most profitable portions of the farm. If, then, we set new orchards we should make the conditions similar to those

which prevailed 50 or 75 years ago. This may be most easily accomplished by growing tap-rooted and leguminous cover crops, assisted in some cases by under-drainage. These will tend to promote drainage of surplus water, conserve moisture, make the soil more friable, add humus, promote chemical and biological action, and incidentally add nitrogen to the soil and oust some of the lazy potash and phosphoric acid.

Frequent and intelligent tillage will help materially in aerating the soil. It may be made to conserve moisture, liberate plant food and in all ways promote the comfort and well being of the growing or fruiting of trees. The vigorous, healthy growth resulting from cover crops and tillage makes the trees more resistant than they would be if they were uncomfortable, hungry and thirsty. On most of our soils from this on, profitable fruit growing must be founded on cover crops and tillage, supplemented, in some cases, by drainage and fertilizers.

Doctor the soil before you doctor the tree. Remove the cause, and the effect disappears. You can't cure rum blossoms with vaseline, you must break the demijohn; start the orchard where nature left off, and not where the renter did. The rivers run to the sea, overflowing the city and plain, yet the sea is not full. The waters return to the land, but the land cannot contain them. The roof of the natural reservoir is sealed because of ignorant tillage; the surface is like a leaky roof, which sheds part of the water and allows a part to pass through. The waters hasten to their home in the sea, since they are not welcomed by the land. The reservoir runs dry, the plants are sick unto death of thirst and hunger, and the bug foreclose their cut-throat mortgages.—*Am. Agriculturist*.