

HORTICULTURE

The Enrichment of the Orchard Soil

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Why should it be necessary to enrich the orchard soil? In the first place because there is an annual drain on the available soil plant food by the trees. We have done a considerable amount of work on the chemistry of the apple and I compute from our analysis that the following amounts of the essential elements of fertility are removed in ten years per acre, i.e., by 40 trees, when the orchard is in full bearing: Nitrogen, 600-650 lbs.; phosphoric acid, 135-150 lbs.; potash, 700-850 lbs. These amounts are distributed of course, between root, trunk, branches, twigs, leaves and fruit; a part is locked up in the wood of the tree, a part is lost in the leaves and fruit. Compared with other farm crops, the orchard is not exhaustive in the sense that that term is usually applied, but nevertheless our results show the necessity for a continual supply of plant food in an available form.

Some years ago we analysed four well known varieties of apples and from the data then obtained, and assuming a yield of 160 barrels per acre, I calculate that the amount of plant food removed in the fruit from this area, per annum, would be from 9 to 10 lbs. of nitrogen, 5 to 6 lbs. of phosphoric acid and 32 to 35 lbs. of potash. These amounts are by no means excessive.

We also analysed the leaves of the apple tree, collected in May and September. We found that, as the leaves ripened, there was a considerable return of the plant food they contained to the wood so that the fallen autumn leaves are not as rich in potash and phosphoric acid as when they were younger. However, 1,000 lbs. of leaves in September still green and containing a percentage of moisture, would contain nearly 9 lbs. of nitrogen, almost 2 lbs. of phosphoric acid, and approximately 4 lbs. of potash. It has been estimated that in the fallen leaves per acre an annual loss may ensue of approximately 23 lbs. of nitrogen, 6 lbs. of phosphoric acid and 12 lbs. of potash. A part of this may, of course, be returned to the soil but, owing to high winds in the autumn, it is extremely doubtful if much of it gets back to where it came from, unless there is a cover as the soil is concerned, the plant crop to hold the flying leaves. So far food stored up in the wood and that in the fruit and that, of course, be regarded as lost.

Without unduly lengthening this paper, I cannot discuss in any detail the losses of soil plant food in other ways. If the orchard is in good health the hay removed, the exhaustion is greater than that incidental to the growth of the trees. If on the other hand, the soil is continuously under cultivation there necessarily follows a very considerable loss of nitrogen and destruction of humus. This fact we have established in the Experimental Farm Laboratories. It is very evident, therefore, that under all ordinary conditions there must be a return of plant food if the orchard is to thrive. We think this in the majority of instances can be accomplished in the most economical and satisfactory way by the growth and turning under of one of the legumes. This class of plants might be known as nitrogen-collectors, for they are able through the agency of certain organisms (bacteria) that

reside on their roots to appropriate and build up into their tissues free nitrogen from the atmosphere.

F.O.B. Contracts for Apples

P. J. Carey, Dominion Fruit Inspector, Toronto

An important matter for the consideration of growers and dealers, is "sale contracts." Almost every contract made in the sale of apples last season was violated one way or another. It is true that the "money stringency" had considerable to do with the upsetting of contracts, but the fact remains that with contracts made as they were last year, it is little use in making a sale at all.

It is being advocated, and rightly, from ocean to ocean, that f.o.b. car sales as much as possible, is the proper way to dispose of one's fruit, and surely contracts can be made secure, so that our apples will stay where they are sold, whether the markets go up or down.

Apple Growing North of Lake Ontario

(Continued from page 1)

It is surprising how many farmers are yet unfamiliar with the Inspection and Sale Act, part IX (the Fruit Marks Act). A copy of this act will be sent to the growers on application to the Fruit Division, Department of Agriculture, Ottawa. Until the farmer becomes familiar with this Act he is at the mercy of the buyers. They may carry a copy of it around with them and may read a part of it, but the apple grower is likely to be deceived if he does not get the Act himself and study it carefully. All contracts, wherever grades are mentioned, should read "Grade No. 1 and Grade No. 2 as defined by the Inspection and Sale Act, part IX." With the Act in his hand, the apple grower can make no mistake with reference to the marks that are required on all fruit packages.

One value of these orchard meetings such as were held in this district, is that they give an opportunity for clearing up erroneous impressions with reference to the Inspection and Sale Act. Briefly it may be noted that the Inspection and Sale Act asks only that the fruit be packed honestly, of the same quality from top to bottom, and that it be marked honestly, Grade No. 1 or Grade No. 2 as defined by the Act. There are few complications about it, and there is no reason why any grower should be led astray by designing buyers.

CO-OPERATION

There are very few co-operative associations in this district. They are being strongly opposed by the buyers of the less reputable sort. These buyers are not interested in securing a fair price for the fruit for the farmers, but are interested in making as big a profit as they possibly can. The larger buyers and real fruit merchants are in favor of co-operative associations, inasmuch as they enable them to get larger quantities of fruit with greater assurance that the quality and marking are right. But many dealers of the "sharp" sort see in the co-operative associations only a number of

apple growers removed from the chance of being imposed upon by their fairly sales with reference to crops, prices and market conditions.

APPLE BUYERS

Not a few apple buyers attended these meetings. Some of them expressed their approval of the Inspection and Sale Act and co-operative selling. But the most of them found in the Inspection and Sale Act, and in the co-operative associations, a restriction upon their actions. The members of the co-operative associations could not be imposed upon. The manager, probably a smarter man than the buyer, looked after the market end of the business for the grower. Some of these dealers were opposed to the Inspection and Sale Act because it interfered with their buying orchards by the "lump." With the spread of knowledge and the help of the co-operative associations, it is to be hoped that the apple industry will dispense with many of these disreputable apple buyers, and that the fruit may pass into the hands of the producer to the apple merchant who will forward it and distribute it, with as little expense as possible, to the customers at home and abroad.

RECOMMENDATIONS

Everywhere there is evidence that though orchards have been giving excellent returns, the orchardists are very poorly informed in their business. There is very much need for educational work throughout the whole of this district. By way of practical recommendation I would suggest:


1. That the main line drains, at least, be run through the depression in the orchard. It could be much better if the whole ground were thoroughly under-drained, but if only the main drains were put in it would improve matters very much.
2. That cultivation be commenced as soon as the frost is out of the ground, and the cover crop sown not later than the middle of July.
3. That all orchards, old and young, be sprayed at least three times with the poisoned Bordeaux mixture, the first spray to be made as soon as the first green is seen; the second spraying as soon as the blossoms have fallen; and the third spraying ten days or two weeks later. Better still, spray first with lime and sulphur between March 20th and April 20th or not later than just before the buds swell, and then three times with the Bordeaux mixture as directed above. Either of these systems of spraying, even if followed mechanically, would hold in check nine-tenths of the insects and fungous diseases which infest the orchard.
4. That an improvement be made in the system of pruning which would keep the outside of the trees thinner, and would grow more new wood on the larger branches towards the centre of the tree.
5. That experiments be made in the low headed form of tree. This would have to be done consistently throughout the whole orchard, and the implements of culture would have to correspond to the low-headed form.
6. Organization among the apple growers, not only for the purpose of

selling their fruit, but for the purpose of buying supplies and for the purpose of rendering themselves in a measure independent of the itinerant apple buyer. The Inspection and Sale Act should be widely distributed and carefully read by every apple grower, otherwise a certain class of apple buyers are apt to make false representations to the financial loss of the growers. I was unable to find a single grower who had sold under a contract drawn up by himself. Where contracts were signed they were drawn up by the buyer and wholly in his interest. If a written contract accompanied every sale, with the stipulation that the grades No. 1 and No. 2 referred to in the contract would mean Grade No. 1 and Grade No. 2 as defined by the Inspection and Sale Act, much annoyance and serious financial loss would be avoided.

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