

above-mentioned gentlemen, the apples were allowed to ripen properly on the trees. Having now given credit where credit is due, I need not apologize for quoting a few sentences from a letter I have just received from the friend in Edmonton who is handling the apples. "Your apples are certainly beauties." "They are good all the way down the barrel." "A man who had been buying Ontario apples for years said that these were the first really good ones he had got." "They beat the British Columbia apples all hollow." My correspondent also said: "Tell your friends that it is useless to send apples out here unless they are properly graded and are what they are claimed to be—in short, tell them that they must be honest." That reminds me that the first time my correspondent wrote, the message was: "You need not be particular about the grading if you send good Ontario apples." An experience of selling showed that this was altogether wrong. Because the apples I shipped were properly graded, they brought a dollar a barrel more than the prevailing price in Edmonton. Ungraded and improperly branded Spies are going begging at \$6 a barrel and less. It looks as if the use of a conscience when packing apples increases the value a dollar a barrel. It seems to me that we should have a bulletin from the Department on the cash value of a conscience.

Now, how about all that talk we have been hearing about buyers not being able to pay more than a dollar a barrel for apples? My expenses per barrel were as follows: Picking, 15 cents; barrel, 50 cents; packing, 30 cents; hauling and loading, 10 cents; freight to Edmonton, \$1.70. Total, \$2.75. On the Spies, that leaves \$4.25 to be divided between my friend and me. Just how we are dividing it is a personal arrangement, but I am getting more than fifty cents a barrel. According to one correspondent (an apple buyer, by the way), the buyers do not expect to make more than 50 cents a barrel. If I made a deal of that kind, I would clear \$3.75 for my apples on the trees. But I am not demanding any such division as that. I am willing that my friend should do as well out of the speculation as I am doing. Even if we divided everything equally, I would be getting about four times as much as I would have got if I had sold to a dealer, but the buyers avoided me. I talk too much. Of course, it may be argued that my apples got a lot of free advertising, but the dealers are business men, and surely they can handle apples as successfully as I can. Even if they sell for a couple of dollars less than I got, they would still make \$1.75 a barrel profit on apples that cost them fifty cents in the orchard. That strikes me as being altogether too much. It is all well enough to talk about letting the other man live, but a great deal depends on how well he expects to live.

You will notice that I did not rise to the high ideal set by the Toronto Board of Trade. When I got control of the selling end, I did not sell to the consumer more cheaply than the regular dealers. Why should I? The dealers have made the market price, and the consumers did nothing to help me get my apples on the market. On the contrary, they were willing to pay me a dollar more a barrel because my apples were mature, properly graded, and of good quality. I do not think anyone can blame me for taking the price I was offered, especially as the consumers are satisfied. Still, \$7 a barrel is an unreasonable price to pay for apples in Edmonton. If anyone in that city had had the gumption to send to this district for apples, he could have secured plenty that would be just as good as mine for \$2 a barrel f.o.b. In car-load lots the freight to Edmonton would be \$1.70. That should enable him to sell the apples at \$5 a barrel and make a profit of \$1.30. Co-operation of this kind would benefit both the consumer and the producer. But if an Edmonton man undertook to buy apples here, no one would have the right to expect him to pay more than the market rate. He would have filled his cars this year at \$1 a barrel, and, selling at the prevailing rate in home city, he could have sold for \$6 a barrel and, after deducting the freight, he would have had a profit of \$3.30 a barrel. No one could have blamed him for this. He would not be the man who was controlling the market and forcing up prices. He would simply be taking the same profit that other middlemen are exacting. But knowing that such profits are being made, why do not the producers and consumers do something to get together for their mutual benefit? If an Association of consumers in Edmonton dealt with an Association of farmers in Middlesex, the farmers could get \$2 a barrel and the consumers could get the apples for \$3.70 a barrel. That would be entirely fair to both. Since the middlemen seem bent on exacting undue profits, the producers and consumers have every right to protect themselves in this way, and it would be much

more sensible for them to do it than for the producers to grumble about low prices and the consumers about high prices. Neither is doing any thing to protect himself in the matter. Surely one or the other, or both, will organize before another season. Personally, it would be better for me if they did not organize, for, having broken through once, I can break through again. My friend has already written to me about what we should be able to do next year, as we now have a list of satisfied customers who will be willing to deal with us again. And unless the producers and consumers take some steps to protect their own interests, I see no reason why we should not do it. However, I am hopeful that the farmers of this district will bestir themselves and organize. They surely have had a chance to see that if they follow the instructions given by the Department of Agriculture, they can produce first-class apples, and that if they grade them properly, and take the trouble to market them themselves, they can get profitable prices. Thanks to the valuable assistance I have received at every step of the work of handling the orchard, there has been a complete demonstration, from the pruning to the selling, and Mr. Whale, who represents the Department in the County of Middlesex, is not only willing, but eager, to give to everyone the same instruction as I got. If farmers of this district do not get the best prices going for their apples next year, the fault will be their own. And now is the time to begin learning just how the orchards should be handled next year. There is nothing mysterious or hard about it. It is simply applied common sense.

The Storage Rots of Potatoes.

For some months past an inspection of stored potatoes has been carried on by the Division of Botany, especially of potatoes among which the presence of potato canker or powdery scab was suspected. During this work it was recalled that the losses from the various "rots" affecting stored potatoes were considerable, and of far greater economic importance than is generally realized. In some instances from 8 to 40% of the potatoes had become quite useless, owing to various forms of dry or wet rots. This observation made so early in the season is a bad outlook for the safe-keeping over winter of the remaining potatoes. "Storage rots" of potatoes may be induced by a variety of agents. To begin with it must be understood that a perfectly "ripe" potato providing, of course, it is free from blight or other diseases, is less liable to be affected by rot than those harvested too early. This statement raises the question: When are potatoes ripe, i.e., in the best condition to dig? Digging potatoes depends largely upon individual conditions prevailing at the various farms; in wet land it is advisable to dig them earlier than on dry land; they will also have to be dug at a later date when badly affected by blight, than if they were free from it; but in general potatoes are ready for digging, under normal conditions, when the stalks have died down and hence no longer take an active part in the manufacture of the reserve food which is stored in the tubers. Here it is where the psychological moment may be missed, for there are potato diseases such as late blight, early blight, rhizoctonia, or even the attacks of the flea beetle or potato bug, which may cause the premature death of the stalks, and which may be mistaken for their normal "death." Where these conditions prevail the potatoes underground are not "ripe" and, what is more important, there is no chance of their becoming ripe, however, long they are left in the soil.

A ripe potato has all its cells well supplied with food material, i.e., starch, and the skin adheres firmly to the tuber when the finger or thumb is applied to the surface with a firm rubbing movement. When the skin is easily detached during this operation the tubers are not ripe and should be left in the ground, providing the tops are free from disease. It is an unfortunate fact, however, that the largest percentage of potato fields are attacked by late blight and the stalks are killed prematurely. In this case the tubers will also have become infected and are liable to decay in the pit or cellars, unless certain precautions are exercised.

The second factor favoring and indeed inviting decay is where potatoes are lying too close to the surface of the ground in the field. Such tubers are easily touched by frost, and if not separated at once from those unaffected, they are sure to decay when placed in storage.

Another prominent source of rot in storage are the apparently unavoidable injuries during harvesting of potatoes, especially when a potato digger is used. However, slightly a potato may appear to be damaged, as soon as the injury extends below the skin, the tissues rich in available food are open to an invasion by spores of fungi and bacteria, which find in such wounds a very suitable feeding ground. A large number of such potatoes are picked up, notwithstanding

every care, and are finally deposited in the bins or pits.

The above mentioned factors involving more or less mechanical or physical features deserve, nevertheless, to be taken into careful consideration. The conditions described on the potatoes themselves which may be regarded as factors weakening the power of resistance towards storage rots, and what is more their exposure in their impaired condition of "health" to the favorable conditions for the development of bacteria and fungi which are ever present in bins, pits or the places of storage, should certainly be regarded as the most prominent factors responsible for the largest amount of losses occurring during storage.

What is necessary to start into action the myriads of fungus spores and bacteria present everywhere, and so destructive to stored vegetable matter of any kind? Is it not the moisture, warmth, absence of ventilation and light that encourages decay and rot, and are not these conditions fairly constant in all pits, bins, etc., where potatoes are stored? Besides the excellent food in the potato is ready prepared for the use of the ravenously feeding organisms of decay. Giving these lines a moment's thought and consideration, will the majority of readers not own that these very conditions prevail in their own cases? Have your potatoes been dug at the right time, were they quite ripe? Were none touched by frost or damaged by the digger? Is your cellar or pit well ventilated? If so, you have nothing to fear from storage rot, for then you are no doubt awake to the necessity of preventing late blight and other diseases. But those who must own up to one or more similar "sins of omission" had better turn to their potatoes at once and start hand-picking them over, taking out all potatoes that show any of these signs.

The question is frequently asked by farmers sending samples of potatoes affected with storage rot whether there is any treatment to prevent it from spoiling their potatoes. I am afraid there is nothing to be done to stop the decay once it has set in, beyond the fact of hand-picking them, removing all damaged, frozen or diseased potatoes, providing good ventilation and using for storage a cool place.

In the preceding lines I have spoken about the result to be expected from unripe, frozen or damaged potatoes, and have pointed out that without being actually diseased they are liable to suffer considerable losses. But how much more quickly will the decay set in when the tubers have been attacked by late blight and other diseases, eventually finding their way into the tuber.

There are a number of distinct parasitic diseases of the growing potato which will start a "storage rot," and which will spread by contact from diseased to sound tubers. Late blight (*Phytophthora infestans*) is the worst offender in this respect. The amount of late blight present in a field largely depends upon the successful and rapid control of the potato bug. When the potato bug has been allowed to gain a foothold, even if only for a short period, the vines are generally so much injured that it is almost impossible to keep the late blight from playing havoc.

In some potato experiments carried out under my instructions at the Central Experimental Farm, Ottawa, with the view of producing potatoes as free from disease as possible under practical farming conditions, we secured from the four acres grown 1,770 bushels, which averages about 440 bushels per acre, by no means a light yield; but notwithstanding careful spraying the potato bug had done enough damage before it was controlled, so that late blight appeared and still caused far too much loss. Unless spraying is begun very early in the season late blight is difficult to control, and often about August and September the potato tops have been killed. Thus not only is the manufacture of the reserve food to be stored in the tuber discontinued and the tubers remain unripe, but the disease spreads into the tubers. When this has taken place, the potatoes may be left in the ground for a week or so longer, when the root will be more apparent, but when digging the potatoes they should be hilled up on the field, covered lightly with straw and earth until they have dried up well. Before taking them in, the potatoes should be carefully hand-picked to remove all diseased or injured potatoes.

It is hardly necessary here to mention other diseases affecting the potato plant, for whatever their nature, as soon as the tubers become affected it amounts to the same thing, they must be picked out to prevent storage rot. Diseases like potato rosette or little potatoes (*Rhizoctonia*), fusarium rot and others which may affect the potato tubers must be controlled or prevented by the use of good sound seed. When the potato tuber is once affected it is very liable to decay after being stored.

I have concluded in the term "storage rot" a number of organisms causing the various forms