

## The Pre-cooling of Fruit for Shipment\*

J. A. Ruddick, Cold Storage Commissioner, Ottawa

The so-called pre-cooling of fruit, vegetables, or other produce, consists of an arrangement whereby the circulation of air which is chilled with a refrigerating machine, is directed through a loaded car by means of temporary and adjustable pipes or ducts. That is to say, the car is placed in the same relation to the refrigerating machine for the time being as an ordinary chamber in a cold storage warehouse.

My attention was first drawn to this system by the work of the bureau of plant industry of the United States Department of Agriculture in California where they experimented in connection with the shipment of citrus fruits and vegetables in conjunction with the Pacific Fruit Express Company, a subsidiary company of the Southern Pacific Railway system, and by correspondence with Mr. L. A. Roy, of Chicago, who is interested in the promotion of the idea.

Two years ago, I fitted up the necessary connections at the St. Catharines Cold Storage and Forwarding Company's warehouse, but we were never able to give it a fair trial on account of the small size of the plant. The partial cooling which was affected was undoubtedly of some benefit, but hardly worth the time and trouble. It would take too long with the six ton machine in use there. The pre-cooling of a car-load of warm fruit, in addition to the chilling of the car itself, which is a considerable item, takes about two tons of refrigeration and as it should be accomplished in about four hours, it is equal to a machine capacity of twelve tons in twenty-four hours. If two cars were to be cooled at one time, it would require a plant of at least twenty-five tons capacity. Further, in order to be effective, the cold blast should have a temperature of not more than twenty to twenty-five degrees and that precludes the possibility of using the same circulation in the warehouse where the temperature in the fruit rooms must not go below thirty-two degrees. As long as the fruit in the car is warm, the cold air blast can safely be reduced to several degrees below the freezing point, but this is not permissible in a warehouse where the contents are already reduced to the minimum of safety.

During the summer of 1909, I had an opportunity of inspecting the large plants which have been erected by the Southern Pacific Railway in California. They have spent \$1,500,000 on two plants, one at Roseville in northern California and the other at Colton in the southern part of the state.

These two plants are at interior points where the traffic converges for the overland journey. The one at Colton has 500 tons of refrigeration and can handle a whole train of cars at one time. In addition to the cooling facilities, there is a large equipment for making the ice with which to fill the bunkers of the cars.

You will observe that these cooling facilities are being provided in California by the railway company and I am of the opinion that it properly falls to them to do it. In the first place, they benefit by the saving of ice, and a plant erected by the railway can be made to serve a whole district at very less cost than the aggregate cost of erecting and operating a number of small plants. Moreover, it should be the business of the railways to carry the freight which is entrusted to them in the best possible manner and, if pre-cooling comes to be one

of the necessary aids to the transportation of Canadian fruit, it seems to me that it is up to the companies to furnish it.

I can see the possibility in the future, or I might say the practicability of operating a plant, say at Hamilton, to serve the district between Niagara and that city in connection with western shipments. With some system of prompt movement of the cars from loading points to the cooling centre, they would be started on their overland journey without serious delay and with the best possible chance of reaching their destination with the contents in good condition.

It will be evident from what I have said that pre-cooling does not differ in principle from the cooling which is effected by placing the goods in a cold storage warehouse, but if it is conceded, and it certainly may be, that immediate and rapid cooling is important in the handling of perishable produce, then it must be admitted that, under certain circumstances, pre-cooling has decided advantages. One advantage over cooling in a warehouse is that it saves handling the fruit and the consequent exposure to warm air while being transferred from warehouse to car, a thing to be avoided as much as possible. With proper equipment, a car-load of fruit may be cooled in this way as much in four or five hours as it

would be in two or three days with ice only in a refrigerator car. A more rapid circulation of air at a much lower temperature than can be secured with the use of ice removes the heat in a comparatively short time.

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## Canadian National Apple Show

Although the British Columbia Government have refused to make a grant, arrangements are being pushed in British Columbia for the proposed first Canadian National Apple Show. Officers have been elected. The treasurer of the Board of Management is Geo. R. Baldwin, a controller in the city of Vancouver. In addition to the cash already in sight the committee

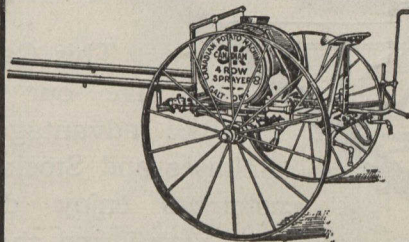
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\*Part of an address on "The Cold Storage of Fruits," delivered before Ontario Fruit Growers' Association at its last convention.