

(NOT FOR PUBLICATION)

ANNOUNCEMENT: The Weather Man is going to talk about protecting orchards from frost, in his weekly Chat this evening. The Chat is released every Wednesday by the United States Department of Agriculture through Station_____.

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"You know, Preston, we're doing a lot about the weather these days. Mark Twain -- who said that 'everybody talks about the weather, but nobody does anything about it' -- should come to life today, he'd be surprised".

It was the Weather Man speaking. We were on a fast train, riding through the fruit belt. I was an interested listener.

"Yes sir -- Mark Twain would certainly be surprised....."

"How come?" I asked.

"Why, don't you see? he exclaimed. "In the old days, the prosperity of the fruit growers depended almost entirely on the weather. Good growing weather -- no late frosts -- generally meant good crops. But a frost could come down in the night and destroy the crop and the orchardists' hopes at the same time".

"But how's that changed lately?" I wanted to know. "We still get frosts, don't we? And I don't know as I've heard that frozen crops have been entirely eliminated in the last few years".

"Oh, I don't mean that man in his wisdom has eliminated frosts, Preston", drawled the Weather Man. "But He's learned that old Jack Frost isn't the invincible, blustering fellow he once was. Nowadays we let him come -- but get ready for him with oil burners in the orchard. Heating the orchard a few degrees is generally enough to get old Jack down and hogtie him".

"That's all very well", said I. "But how do you know when he's coming so as to get the burners ready for his unwelcome visit?"

"Easy. That's where the Weather Bureau steps in. Last winter,

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in one very important fruit-growing district the weather man made 48 distinct low temperature forecasts. Seventy nine per cent of these forecasts were correct within 1 degree. Ninety eight per cent were correct to within 2 degrees. The greatest miss during the entire winter was only 2 and seven-tenths degrees. When temperatures are expected to fall as low as 32 degrees in any district during the night, a forecast is made and spread widely through the district. This forecast contains a definite statement, sometimes to tenths of a degree, as to just how low the temperature is expected to fall. There are 8 trained Weather Bureau men assigned to this frost work and forecasts are remarkably accurate.

"You know, Preston, there are certain warm-climate fruits, such as oranges, lemons, olives, dates, and figs. Then there are fruits, such as the apple, cherry, currant, gooseberry, and cranberry that thrive in fairly cool regions. Because certain fruits thrive best in certain regions, farmers and fruit growers have come to learn the limitations of those fruits and operated accordingly. Citrus fruits originated in the Tropics and for that reason, citrus culture in the United States is limited to certain sections such as Florida and California. But even there, they often need artificial protection against late frosts. The fruit industry is a huge business and can afford to spend large sums of money for this protection".

"How do they protect the fruit from the frost?" was my next question.

"In the early days, they built log fires in the orchard. Coke burners were used later. Orchardists burned coal amid the trees around 1896. By 1910, open cans or pots, holding 1 or 2 gallons of oil, were introduced. Since then, that practice has become more and more popular. The destructive freeze of 1913 hastened the use of heaters in practically all of the big citrus orchards. The growers decided that, to maintain the industry on a paying basis, protection of the trees would have to be practiced. At first they thought the best protection was gained by covering the orchard with a dense blanket of smoke. They soon found out, however, that heat is what is needed -- not smoke. Nowadays they use a well-built heater, with a capacity of 9 gallons of oil, well-fitting draft regulators, and improved stacks. These reduce the amount of smoke to a minimum. The heaters cost about \$3 apiece. About 50 heaters are needed per acre of orchard."

"Why is it that fruit needs protection, when vegetables and other crops seem to get along without it fairly well? I asked.

"Well", answered the Weather Man, "some vegetables and crops do need protection in many parts of the country. But the weather risk in fruit growing in the United States is much greater than for most crops, mainly because of low winter temperatures which damage twigs and buds, or spring frosts which kill advanced buds or blossoms. Sometimes short periods of warm weather in the winter start the buds developing. Later

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cold weather kills them if they're not protected. Then, too, vegetables and similar crops are annuals planted every year. A farmer can plant his seed when danger from frost is past. But the fruit trees last many years and are there in the orchard, at the mercy of sudden freezes."

"I see", said I. "Now tell me how they operate the heaters on a large scale."

"Well, first of all orchard heating, must be systematically done, to be successful", said he. "There must be plenty of equipment and a good reserve of fuel oil. The really big orchardists build central tanks in their orchards. These serve as reservoirs for the heaters and are filled with oil in the summer. In California, the heaters are placed in the orchards about October 15th. That's so as to be ready for an early frost. Then, with the heaters already placed and plenty of oil ready for emergencies, word is awaited from the Weather Bureau as to the coming of a cold wave. We usually pass out the word 2 or 3 days in advance of the wave itself. The big orchards are divided into sections, with a central weather station in the middle of the grove. A Watchman is placed at the central station. When the temperature at the central station gets near the danger point, a runner is sent out to find the temperature at the coldest spot in the orchard. He returns quickly, and, if the temperature has reached the danger point, a gang of lighters is sent out to light the burners. At first, only part of the heaters are lighted. Then, if it grows colder, more are set to burning. If it grows warmer, fewer heaters are lighted. In that way, aided by forecasts from the weather men, the fruit grower is able to save oil and his fruit at the same time. It's a mighty good thing, too, for both are valuable. Vast sums of money are saved in this way every year. Ant its a rare thing for a big grower to lose his crop these days."

Just then the train whistled for a station and the Weather man and I bade each other good bye

National Oceanic and Atmospheric Administration

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