UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

OUTDOORS WITH THE SCIENTIST. Tuesday, April 9. 1929

NOT FOR PUBLICATION

SPEAKING TIME: 10 minutes.

ANNOUNCEMENT: We have a message from the Weather Man in the United States Department of Agriculture's OUTDOORS WITH THE SCIENTIST radio program today. Station_____'s farm audience will be especially interested as the talk deals with how the U. S. Weather Bureau helps fruit growers protect their crops from frost.

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The other day, the Weather Man and I were driving through a beautiful stretch of rolling orchard country. Buds were already beginning to burst on some of the trees. Things felt good.....

We came to Jed Brown's place. Mr. Brown's a farmer who owns a thriving orchard. He has money in the bank. Jed was standing by the front gate

The Weather Man threw the car out of gear and braked it to a stop.

"Hello, Brown," he called--- "howdo the crops look?"

"Fine," said Brown--- "how's the weather?"

Then we all grinned. We knew that these are 2 of the oldest greetings in the world.

"Well, Brown," said the Weather Man, "I think I can promise you fair weather for tomorrow."

"Crops are fair, too," said Brown.

We were all feeling free and easy. Brown came and sat on the running board. That meant he had time for a few words. We also had 10 minutes to spare.

The Weather Man turned to Brown. "I know why you fellows are always asking about the weather," he began. "It's a natural thing to do. An extra quarter of an inch of rain at the right time may add thousands of bushels to your corn crop. A few degrees lower temperature may give the potato grower

a bank account. The direction of the wind is sometimes more important than the cost of farm labor. The weather's a matter of business to you fellows--- you farmers. Am I right?"

"You're right," said Brown. "And I know why you scientists are interested in crops, too. A larger wheat crop will mean cheaper bread. A good crop year will also mean a good year for you. Am I right?"

The Weather Man smiled and nodded his head.

I figured it was time for me to get into this palaver. "If you fellows are through patting each other on the back," I said, "I'd like to ask a question."

They both turned to me.

"Listen," I said. "What would happen to this orchard if a good frost hit it tonight? Where would your science be then? What could you do about it?"

"I can't answer that in 10 words," the Weather Man said. "It's quite a story."

"Go ahead and tell it," I said.

"In the old days," he began, "the prosperity of the fruit growers depended almost entirely on the weather. Good growing weather--- no late frosts--- meant a good fruit crop as a rule. Of course insect pests had to be considered. And the orchardist had to pay attention to his markets. But Jack Frost used to take a whale of a lot of profit out of fruit growing.

"Well, we haven't conquered <u>frost</u>, of course. But we have learned to take advantage of it. Nowadays, the big, practical orchardists let the frost come--- but they prepare for the freeze with oil burners and frost warnings. A battery of heaters in the orchard is generally enough to get Jack Frost down and hogtie him."

"That's all very well," I said. "But how do you know when to expect a visit?"

"That's where the Weather Bureau steps in," the Weather Man explained. "Last Winter, in one very important fruit-growing district, weather observers made 91 distinct low-temperature forecasts. Ninety per cent of these forecasts were correct to within one degree. Ninety-seven per cent of them were right to within two 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 that district. This forecast contains a definite statement, sometimes to tenths of a degree, as to just how low the temperature is expected to fall. Eight specially trained Weather Bureau men are assigned to frost work. Their forecasts are amazingly accurate.

"You know, friends," the Weather Man went on, "there are certain warm-climate fruits such as oranges, lemons, olives, dates, and figs. Then there are fruits such as apples, cherries, currants, gooseberries, and cranberries,

that thrive in cool regions. Because certain fruits grow best in certain regions, farmers and fruit growers have learned the limitations of those fruits and governed their orchard work accordingly. Citrus fruit originated in the tropics and, for that reason, citrus growing in the United States is limited to warm countries such as California and Florida. But even in California and Florida they sometimes have late frosts--- although you'd better say that softly. Well, that means that the orchards have to have some artificial protection against the chance of late frost. The fruit industry is a huge business and can afford to spend a lot of money for this protection."

"What I want to know is how orchardists protect their fruit from frost?" I put in.

"In the early days, they built log fires in the orchard when frost threatened," the Weather Man said. "Later on, they used coke burners. About 1895, fruit growers were burning coal among the trees and by 1910, open cans or pots, holding one or two gallons of oil, were introduced. Since 1910, that last practice has become popular. Take the destructive freeze of 1913, for example. That big frost hastened the use of burners in practically all the large California citrus orchards. The growers decided that if they were to keep the fruit industry on a paying basis, they'd have to be prepared to protect their fruit against unexpected visits of freezing weather. At first they thought that the best protection was gained by covering the orchard with a dense blanket of smoke. But they soon found that HEAT, not SMOKE, is what is needed. And so nowadays, the many growers use a well-made heater with a capacity of 9 gallons of oil--- well-fitting draft regulators--- and improved smoke stacks. These cut down the quantity of smoke to a minimum. Such heaters cost about three dollars each. About 50 heaters are needed for each acre of orchard."

Brown had a question. "Why is it that fruit needs protection when vegetables and other crops seem to get along without it fairly well?" he asked.

"Think that over," said the Weather Man, "and you'll see that some vegetables and other crops DO need frost protection--- at least in some parts of the country. You cover your young tomato plants, don't you? The weather risk in fruit-raising, however, is far greater than for most other crops, mainly because of low Winter temperatures which damage twigs and buds--- and Spring frosts which kill advanced buds and blossoms. Sometimes short periods of warm weather in the Winter time start the buds growing. The cold weather that comes later will kill these buds if they're not protected. Then, too, vegetables and similar crops are ANNUALS, planted each year. A farmer can plant his seed when frost danger is past. But the fruit trees last many years and they stand there in the orchard at the mercy of any sudden freeze that happens to come along."

"I see," said Brown.

"How do they operate the heaters on a large scale?" I asked.

"Well," the Weather Man said, "orchard heating must be done systematically to be successful. There must be plenty of equipment and a good reserve of fuel oil on hand. The really big-time orchardists build central tanks in their orchards. These serve as reservoirs for the fuel oil and are filled during the Summer. In California, the heaters are placed in the orchards about October 15th. Then they're all set for any EARLY frosts. With the heaters in trim and plenty of oil on hand for emergencies, the orchardists await word from the Weather Bureau as to the approach of a cold wave. We usually pass the word along two or three days in advance.

"The big orchards are divided into sections, with a central weather station in each section. A watchman is placed at each central station. When the temperature at this station gets near the danger point, a runner is sent out to find 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. If it still gets colder, more are set burning. If it gets warmer, fewer heaters are lighted. In this way--- aided by forecasts from the Weather Bureau stations--- the fruit grower is able to save oil and his fruit at the same time. It's a mighty good thing, too, for both oil and fruit are valuable. The heating systems naturally cost money, but they save vast sums of money every year. A big orchardist rarely loses his fruit crop these days. Orchardists are getting wise and they know what to do to protect their valuable crops."

Brown got up to go. The Weather Man stepped on the starter. "getting out frost warnings is only <u>one</u> of the ways the Weather Bureau helps the farmer," he concluded--- "but it's one of the most important ways."

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<u>ANNOUNCEMENT:</u> That concludes Uncle Sam's OUTDOORS WITH THE SCIENTIST radio talk for today. Station_____ will broadcast another talk in this series next Tuesday.

National Oceanic and Atmospheric Administration

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