

SAVING FRUIT FROM FROST



ONE BUSINESS END OF FROST ALARM, THE THERMOMETER

How up-to-date orchardists protect their crops and laugh at the ghost of bankruptcy by using smudge pots to drive away killing cold during the blossoming period : : : : :

By Robert H. Moulton

WITHIN the last two years another and a greater triumph of scientific horticulture has arrived; another natural enemy of the things that grow and bring forth fruit has been vanquished. Jack Frost, long king of the fruit crop, has been dethroned. Fruit growers have literally built millions of fires under him, and burned him out.

Scientific orchard heating has made it possible to raise the temperature of a 200-acre orchard ten to fifteen degrees with as much certainty as the janitor can heat the city man's flat. It takes somewhat more labor than the last mentioned process, but the satisfaction and the profits of "heating all outdoors" are surpassingly greater. Frost insurance for the fruit crop is now just as practicable, just as certain, and vastly more profitable for the money expended than either fire or life insurance.

Insurance by fire for the fruit grower makes vastly greater profits at a much smaller expense than insurance against fire does for the merchant or manufacturer. The little outdoor oil stoves and coal furnaces that have been sold by the millions to orchard owners in the last year and a half have banished from the fruit grower that annual early spring nervous prostration from fear of frost; that periodic, paralyzing fear that he may go to bed at night and awaken to find his whole year's labor chilled to death by a sudden frost. The cumulative despair of losing three or four fruit crops in succession that has put fruit growers out of business and made them dependent on charity or day labor is past. An orchard with a reasonably industrious and provident owner can be made to yield an average crop every season so far as the frost is concerned. Scientific frost fighting with fire is as much a fact as seed testing, irrigation, fertilizing, spraying or pruning. It is the last and greatest advance in systematic horticulture, and has placed the fruit grower abreast of the scientific farmer.

Since the beginning of commercial horticulture, the fruit grower has been at the mercy of the elements. He made all his calculations, all his plans, all his business arrangements contingent on the hope that the frost would miss him. And before the development of orchard heating the chances against him were getting worse in the frost belt. In the modern, commercial orchard, the land, machinery, labor, spraying equipment and cultivation total as heavy an investment as many manufacturing enterprises. And when two or three crops in succession were wiped out by frost, the average grower was completely bankrupt.

Smudging, or the formation of a dense blanket of smoke over the orchard, had been practiced with varying degrees of success in some parts of Europe. Orchard heating proper was first used in California, and the original California smudge pot is still successfully employed in many orchards. In the spring of 1910 several growers in the Grand valley of Colorado experimented with the burning of oil in simple pots of the "lard-pail" type, with the result that they saved their entire crop on the heated areas and lost it on the unheated tracts. The spring of 1911 saw the adoption of the smudge pots on every fruit section of the state, and they reached the experimental stage in several other states. In the spring of 1912 there was not a fruit growing state without them, and many sections of several states were as fully equipped as Colorado.

Frost fighting is not an easy job. It is necessary to have a force of men, industrious and careful and observing to the last degree. And it is no pleasant task to rush out into the still, cold darkness to drudge the better part of the night to save your own or your neighbor's orchard. In the early days of orchard heating, a man was detailed to watch the tested thermometers that were hung in different parts of the orchard and at the farmhouse some distance away from the fruit trees. If the temperature was not sinking fast, perhaps the rancher went to bed for a brief nap, setting his alarm clock to wake him at intervals through the night. Nowadays he can go to bed with a feeling of security, leaving the frost alarm thermometer to watch for him. This electric watchman has for its business end in the orchard a specially made thermometer, with a fine platinum wire fused into the mercury at the freezing point or at whatever is considered the danger point. As soon as the mercury sinks below this wire, the circuit is broken and the alarm at the head of the orchard boss' bed rings out its warning. Any interruption of the current causes the bell to ring so that if the apparatus should be put out of order it automatically tells on itself.

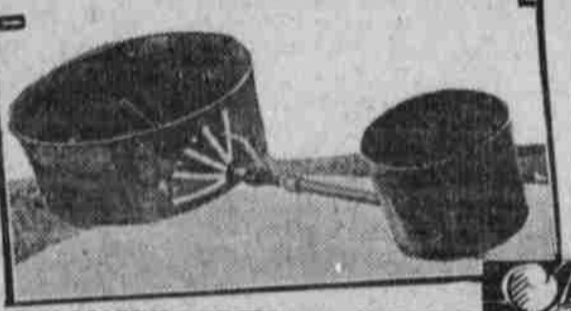
But the orchardist is usually forewarned, even before he goes to bed, and makes ready for the day. Late in the afternoon he notices great fleecy



WHEN THE SMUDGE POTS ARE BURNING



HEATERS WHICH SAVED A CROP OF PEARS FROM A TEMPERATURE OF TWENTY



THIS RESERVOIR HEATER WILL BURN ANY DESIRED LENGTH OF TIME



FAN TYPE OF RESERVOIR HEATER



THE OTHER BUSINESS END OF FROST ALARM

clouds hurrying from the northwest, chased by a bitter wind which seems to have been intended for January, rather than this April night. He goes to the post office for the day's mail and in every window sees the warning of the diligent local government weather forecast: "Freezing temperature tonight." By seven o'clock the government thermometer is at 37 and falling fast. As 7:30 o'clock he telephones the weather man and gets the reply: "Bitter cold all over the country; temperature is already down to thirty-seven in many parts of the valley and will drop to twenty degrees on the western slope of Colorado tonight." By eight o'clock it has fallen to 32, his alarm begins to ring and he knows that King Frost with his icy-fingered warriors is marching on the camp. Steam whistles are beginning to shriek all through the valley to warn the growers of the all-night siege. Farm wagons laden with coal and oil rattle past, giving evidence that the laggards who have been hoping to the last, are beginning to get their heating machinery into action. Already the early ones are firing heavily. Clouds of smoke hang low over the trees, and the little spots of fire beneath punctuate the blackness with rays of hope.

The orchard firemen dash for the trees, a torch in one hand, and a gasoline can to aid in quick lighting in the other. Dashing a few drops of gasoline on the oil, they apply the torch, and the blaze is at work. The lighting is done as fast as the men can walk through the orchard, leaving a trail of smoke and fire behind them. In fifteen minutes each man has his tract of orchard transformed into a sea of flame under a cloud of smoke.

Then comes the first period of rest. The men gather in the packing house or barn, for lunch or smoke, making occasional trips to the thermometers to see that the fire is doing its work. By 9:30 o'clock the thermometers outside the orchard register 28, and those in the area of heat show a comfortable 37. Then the frost fighters know that the battle is half won, for keeping up the temperature is a good deal easier than raising it when it has once reached the limit. The rest is a matter of vigilance. If the heater is of the regulated type, with enough fuel to burn through the night or longer, a few men are left to watch and open the burners wider if a later sudden fall of temperature shows that more fire is needed. If the heaters are of the uniform single-burner type, they may need to be refilled when they are nearly burned out, if the frost battalion should come back for another charge. The outside thermometers drop to 24, and those in the orchard stand at 30, the danger mark of the orchard frost fighter. The heaters are opened wider, or refilled if burning low, and the mercury shoots up to 33. The eight degrees of frost has been driven away, and if the oil supply is plentiful, and the labor unflagging, the orchardist may now consider the battle won. When the sun has shed his rays over the trees long enough to make the outside temperature more nearly that of the orchard, the heaters are shut off by merely putting on the covers.

Heating in the spring of 1911 was much easier than that of the year before, and proved more conclusively than ever the effectiveness of the fires. The crop in the Colorado fruit area for 1911 averaged about 55 per cent. The unheated orchards

yielded from 20 to 75 per cent of a crop, while the yield of the protected orchards was from 95 to 100 per cent, so heavy that thinning was necessary in many of them.

Individual testimony to the efficiency of orchard heating in every fruit growing state could be multiplied indefinitely. Fruit crops valued at \$250 to \$750 an acre were frequently saved at a cost of seven to ten dollars an acre. One Colorado grower, for instance, with 50 heaters to the acre raised the temperature of his 40-acre orchard from 18 to 28 degrees and produced 41 carloads of apples.

One of the most remarkable stories of heater success comes from Missouri. A 240-acre orchard located in a deep valley had suffered severely from frost every year and had not produced a full crop for 14 years. Against the advice of all wise-acres, two brothers from Kansas City bought it, and equipped it with 5,000 heaters of the controlled or graduated type. With 35 or 40 pots to the acre, the firing was done for four nights at the time the apples were in bloom. They harvested a crop of 15,000 barrels, valued at \$45,000, and it was the only crop in that fruit-growing territory. The net profit on each acre approximated \$200.

The first cost of installing an oil-heating plant is higher than for a coal or wood outfit, but the results in time saved and efficiency gained have made it the most popular fuel. Oil can be obtained in quantity at prices ranging from four to seven cents a gallon, and it makes a quick, strong and easily controlled heat. One man can care for from three to five acres of orchard for four or five hours and this is about as long as it will be necessary to burn under ordinary frost conditions. The prices of the oil heaters range from twelve cents for a simple "lard-pail" type to 45 cents for one of the controlled fire-area type, holding three gallons and burning at full capacity for ten or twelve hours, or even longer if regulated for a smaller blaze.

MONKEY FLESH HIS ONLY MEAT.

Too proud to beg, and finding himself on the verge of starvation because of the impoverishment of his noble family in Europe, Count Franz Lazarini, a remittance man well known in Central America, went to a jungle near Managua, Nicaragua, and kept himself alive for five months by eating monkey flesh and roots and berries, according to reports to marine corps headquarters there.

A party of United States marines while on a big game hunting expedition discovered the titled foreigner and took him back to the Nicaraguan capital.

The count, half starved and nearly mad because of the privation he had suffered, fought his rescuers and begged them to let him remain in the jungle, the reports say. The marines overpowered him, however, and are now attempting to nurse him back to health and reason at their commodious barracks in the American legation.

Tree Stump as Lamp-Post.

In a Pasadena, Cal., front yard there stands an old sycamore stump about ten feet high. Near the top are the stubs of two branches. The owner of the property lately conceived the idea of using the stump for a lamp-post, and in the top at the end of each branch he has placed electric light bulbs, connected with the powerhouse in the usual way. The result has been picturesque in the extreme, especially on a very dark night.

Life's Little Worries.

Life is a tender thing and is easily molested. There is always something that goes amiss. Vain vexations—vain sometimes, but always vexations. The smallest and slightest impediments are the most piercing; and as little letters most tire the eyes, so do little affairs most disturb us.—Montaigne.

IN THE LIMELIGHT

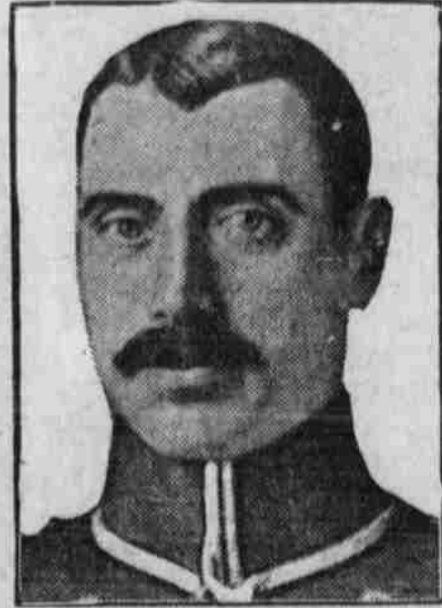
EUROPE'S JOLLIEST KING

The jolliest king in all Europe is Christian X of Denmark. He is far removed from the Hamlet immortalized by Shakespeare. Hamlet was a morose sort of person who lost himself in philosophy. Christian, with the lungs of a giant, can bowl out a music-hall ditty with all the lustiness of a Copenhagen stevedore.

Christian can pull an oar, swing a racket, jump a hurdle, sail a boat, ride a horse, empty a bottle, and make a speech. He is the most popular man in Denmark.

The king is a giant in stature. There is a joke in Copenhagen, first cracked by a jovial Dane, that when the king gets cold feet in December, he doesn't begin to sneeze till May.

In his youth, the present king of Denmark spent some time in a Jutland garrison, and made himself extremely popular with the civil and military functionaries by his politeness to their wives and his friendliness to their sons and daughters. He was—as he still is—a fine dancer, and many stories are still current in Jutland of the democratic manner in which he tripped the light fantastic with pretty peasant girls on Midsummer's eve. He is a little more sedate, now that he is king, but the Jutlanders keep for him a very warm place in their hearts. They showed it when he became engaged. Anxious to have him amongst them again, they paid him a pretty compliment by building for him and his bride and presenting to him as a wedding present, the castle of Marselsborg.



TINKHAM'S SIGNATURE

George Holden Tinkham is a bachelor congressman from Boston, noted for having the most horrible signature in congress.

When he signs his name it suggests the signature of a careless hen dashed off hastily in a radish bed. Only once in his life has Tinkham written his name in a way that made it even half legible. That was when he prepared a sample signature for the purpose of having a facsimile made to go on his official envelope. Tinkham worked for more than an hour on that. And when he got through it was no more like his regular handwriting than if he had hired a stranger to do it for him.

Aside from his chirography, Tinkham seems to be all right. There are persons who claim to be able to read character from handwriting. Such a person would put Tinkham down for a dissipated yeggman. But he would do



the man a grave injustice. The reason Tinkham writes the way he does is because he is eager to get at something else. He is a brisk chap; always in a hurry. Nothing distresses him so much as a slow train, or, in fact, any slow means of transportation.

Tinkham's habit of doing things at high speed includes getting dressed in the morning. He dresses in such haste that he never knows just what he has on until hours later. As a rule, though, his sartorial layout includes a red necktie. He will wear a red necktie every day for two or three months and then suddenly he will appear in one that is bright green simply because he found the green one first.

WILL DRIFT TOWARD POLE

Capt. Robert A. Bartlett, companion of Peary on the trip when the latter, with a negro, reached the North pole, announced he has pledged of \$85,000 for a new project in the arctic regions. He proposes to let a ship be frozen up in the arctic region and then drift toward the pole across a part of the earth never before explored.

"I desire to superintend the construction of a wooden vessel of about 350 tons, especially for arctic work," he said. "We would start in May, 1918, northward through Bering strait; go eastward off the northern coast of Alaska to about 130 west longitude, and latitude 74 or 75, or even farther north; let the vessel freeze up and go with the ice drift through the great unexplored arctic regions. There are more than 1,000,000 square miles of unexplored territory in the Arctic ocean. I would take only eight men with me on the trip, preferably young college men. While we drifted we would take soundings and use a deep-sea dredge to gather the flora and fauna from the floor of the ocean. Instead of regular steam engines and boilers, requiring the consumption of coal, I will install a Bellingham crude-oil engine, thus doing away with the necessity of engineers and firemen.

"From my knowledge of the arctic regions and the currents of general drift of the ice, I should say that we would drift for about five years before reaching civilization again, but we might do it in three years. I would provision the ship for five or six years, and that would be easy with only nine men to provide for. The general drift would be to the west, and I should say that we would eventually come out either between Greenland and Spitzbergen, or between Spitzbergen and Franz Josef Land."



WOMAN HIGHLY HONORED



Catherine Waugh McCulloch of Evanston, Ill., who is one of the presidential electors on the Democratic ticket in Illinois, is the first woman so recognized in the history of either of the historic parties.

She is a lawyer by profession, and was educated at Rockford college and at the Northwestern University Law school. Admitted to the Illinois bar in 1896, and to the Supreme court of the United States in 1898, she has steadily won for herself a high reputation for ability and character. For many years she was in charge of the legislative work of the equal suffragists of the state, and legal adviser of the national organization.

Years ago she became a justice of the peace, and exercised the functions of a judge. She is much interested in religious and philanthropic activities, and writes freely and powerfully.

Mrs. McCulloch, while gratified by the honor bestowed on her, accepts it, not in a personal sense but as a recognition of the new importance gained by women in American politics.