PROTECTION OF PINEAPPLES FROM FROST.

At Orlando, the Interior Pineapple Center—Minute, Practical Description of Some Devices Used.

Paper by Dr. J. V. Calver

The freeze of February, 1899, emphasized the necessity for some means of perfectly protecting the pineapple from frost.

The few pineries that at that time were partially protected by covers demonstrated their utility so that in the following autumn the larger part of the growers in and about Orlando took hold of the matter in earnest. Fortunately many plans were tried, and although sufficient time has not elapsed to demonstrate in full which is the best method, yet a comparison of some points will serve to throw considerable light on this important subject and open the way for additional thought and more perfect methods.

Among the plans tried we mention the following:

1. Covering the plants with pinestraw. The cost is about $25 per acre.
2. Covering with stationary slats three-eighths of an inch thick, four inches wide, sixteen feet long, each one tacked to its place over the three inch opening, gives protection to larger plants if fire is also used during very cold weather; but it makes the pinery dark and excludes the warmth, consequently the development of the plants is retarded. This plan requires about 30,000 feet of lumber and costs from $200 to $250 per acre.
3. Covering with movable slats in sections of 8x8 or 8x16 feet, which are dropped into the open spaces on the approach of a cold wave, has some advantages and some disadvantages. Two men can cover or uncover an acre in about two hours, and in warm weather the plants get the benefit of the sun; but in firing much of the heat escapes through the cracks. The cost for fuel and labor will approximate $5 per night per acre. The primary cost of this cover is about the same as that of the stationary slats.
4. Covering with cloth, while expensive, promises the best results. It makes a tight cover and retains the heat, while sudden falls of temperature are not so
quickly felt. Very much less fuel and labor are required. The cost of firing under cloth in a large pinery should not exceed $2 per acre each night.

Several kinds of cloth have been tried, varying from an eight ounce duck to a four ounce muslin, and various ways of preserving the cloth have been tested to a limited extent. Which is the most economical will take several years to determine.

An extensive experiment was tried with the cloth prepared by the Varn process. This being very heavy it was found impracticable to use as a movable cover, but spread on the top of the slats and securely fastened answered very well. Its first cost is great, but it promises to be durable. Its disadvantages seem to be its great weight in handling, and being nearly water proof it requires irrigating facilities to afford the necessary moisture for the plants.

What appears to be a good method of treating the cloth is to prepare a bath by dissolving one pound of sulphate of zinc in forty gallons of water and afterwards adding one pound of sal soda and two ounces of tartaric acid, each previously dissolved by itself. The cloth is soaked in this solution for twenty-four hours and then dried without wringing. Five ounce muslin treated by this process is in good condition after two seasons’ use.

We personally used a four ounce muslin, passing it through a hot bath of paraffine and oil (heated for safety by a steam pipe) and immediately after through a wringer, using four to six pounds of paraffine to each gallon of oil. Twelve thousand yards were treated in about eighteen hours with the labor of one man and two boys. The muslin had been already sewed into strips three yards wide. The object in this treatment was to use as much paraffine as possible without making the muslin water proof after the oil evaporated. The muslin came off in good condition at the end of one season.

There are two methods of using the muslin, one putting it above the slats, the other below.

When the cloth is placed on top of the slats it is necessary to fasten it very securely. For this purpose wires over the cloth secured by staples were generally adopted.

We used the muslin under the slats, resting on wires three and one-half feet apart. The edge of the muslin was secured by drawing it under and around the corner of the stringer and tacking it once in eighteen inches or two feet, the other edge being lapped over a pole one inch square, which in turn was nailed to the stringer. This proved perfectly secure. The only disadvantage in this method seems to be that as the strips of cloth cross the beds, the cover is more difficult to put on and take off when the plants are very large. To obviate this we would suggest making the strips of cloth fifteen feet wide, and running them lengthwise of the beds. A strip of wood 1x3 inches nailed from post to post would afford means to support the wires and the edges of the cloth. The wires could pass through the centre of the strip or be secured by staples to the under side. Tack the edge of the cloth around the corner on the upper side and the next piece of cloth around the corner on the under side. Fastening it with four ounce tacks in this way once in eighteen inches will make it perfectly secure, and it can be easily put on and taken off.

Other methods are being tried, among
which is a wooden cover to open and shut like a window blind; a similar cover is used for protecting brick in the brickyards along the Hudson river.

The amount of heat required under a tight cloth cover is comparatively small. We used with great satisfaction a very simple coke stove, consisting of a cylinder of No. 20 sheet-iron twelve inches in diameter and thirty inches in length, made slightly tapering. A piece three inches by four inches was cut out of the lower edge, and the whole slipped over the flange of a cast-iron grate, the grate being without legs and when in use supported on three bricks. The fires were started with a very small quantity of wood or charcoal and the coke broken into egg-size. To prevent any possible danger to the cloth, two wires were bent into the form of a letter W and slipped over the upper edge of the stove and these supported a piece of tin about eighteen inches square three or four inches above the stove. Six of these stoves to the acre were found sufficient to keep the temperature at 40 degrees when it was 23 degrees outside, so that ten or twelve to the acre will be sufficient for any cold likely to occur where the pineapple is raised. The cost of these stoves is about $1 each.

The cost of coke with us being not less than $8 per ton, some preferred to use wood. The best plan adopted for burning wood was to use it in a stove of sheet iron of oval form resting on the ground; it had a large door with a vertical movement and a pipe passing through a piece of sheet-iron three feet square to protect the cloth. These stoves, we understand, gave very good satisfaction. They cost, with the necessary pipe, about $3.50 apiece.

We contemplate trying some experiments with oil-burners.

It has been estimated that the additional growth of plants under the cloth cover during a single winter will nearly or quite pay for such a cover.

It may afford the means, when properly understood, of bringing the crop forward so as to perfect the fruit at the season when it is most desired.

The many advantages of a cloth cover seem to justify us in pronouncing it a decided success.

**DISCUSSION.**

Mr. McFarland—I ask the gentleman in speaking of treating cloth with paraffine, etc., to make it water proof and mildew proof, does he treat it for mildew before he gives it the water proof? My reason is I believe that by the experimenting we have done since 1895 we hope to spread around our successes and failures as much as we possibly can. I believe that it is for the benefit of the State of Florida to find out what is right and what is not right to do, and I say what I do without antagonizing any one. In speaking about water proofing a piece of cloth: After twenty-two years' experience by one that knows what canvas is, he ought to have more knowledge about the treatment of canvas for mildew or water proofing than any one who has treated canvas in the United States. Unless you treat a cloth for mildew, do not put on the paraffine; it will mildew quicker than if you do not do anything to it. You must take the starch all out of that cloth; that is what causes mildew; take that out, then put it in a solution of alum—that does not allow it to take mildew. After that water proof it, then you have mildew proof and water proof and you have not got it until you do. Those are facts and I know it.