A YEAR'S EXPERIENCE IN PRACTICAL PROTECTION.

By E. J. Seymour.

Mr. President, Ladies and Gentlemen:

Before I apply myself to the subject, I wish to express my deep sense of appreciation of the interest taken by this Society in the question of protection. I feel that in addressing you I am facing an audience that is fully in sympathy with every effort made to aid in the development and improvement of the natural resources of the State. Since I have through my association with others intent on the same object taken an active interest in the solution of the problem of protection to citrus and other fruits, from the disastrous effects of frost, I have been told that it was useless to try to fight Nature. But when I look into the faces of the intelligent men and women who have come today, to profit by the interchange of experiences each has had in his own particular battle with Nature's opposing forces, I am assured that not one of the illogical pessimists who refuse to "fight Nature" was ever possessed of the spirit and purpose which led to the organization of the Florida State Horticultural Society. I see here gray haired veterans whose whole life has been a constant warfare against Nature in the rough. Their weapons have in some instances been pruning hooks; others have fought frost with fire, and the hands of many of you have been stained with the blood of martyred insects, which have swarmed upon your vineyards and groves with all the voracity of the tribes of the desert upon the habitations of civilization.

Every story of horticultural success is a story of a fight with Nature. Therefore, although there may be an element of novelty, a new departure in the method on which I propose to speak in carrying on the same fight, it is only an advance on the line along which you have been struggling. The road to success in nearly every great enterprise or industry is paved with failure and disappointment, what the fruit growers have had to contend with in fighting various scales, with a frequent recurrence of killing frosts thrown in. While California still has her troubles in that direction she has risen superior to them and the citrus industry in that State, after years of discouragement, seems to be on an assured basis. Ten years ago the orange industry in California seemed doomed.

Fifteen months ago it was the opinion of the majority of the orange growers in the recognized citrus belt of this State, that further attempts to grow oranges for
A PROTECTED TREE AFTER THE FREEZE.
profit must be abandoned. Today there is a different story to tell and the very fact that the citrus nurseries of the entire State have been exhausted in the effort to supply the renewed demand for trees bears testimony to this statement.

Without any assumption on my part, and speaking in behalf of the many minds that have devoted time and money to the solution of the only serious problem in the way of the successful culture of the citrus family, I think I can truthfully say that this change of view is due to the demonstration that practical and positive protection can be assured to the grower. Consequently we may look forward to the reconstruction of the most profitable and by far the most fascinating industry in the State.

While there are numerous devices now in use for the protection of semi-tropical fruits and plants from the ravages of frost, all possessed of more or less merit, and while I heartily endorse any effort made in the direction of restoration of the orange industry in the State of Florida, I propose to confine myself to describing the only method of protection with which I have been intimately associated during the past few months. I refer to the invention of William H. McFarland, known all over the orange belt as the McFarland Tent.

The McFarland Tent.

I think I can speak without contradiction when I say that the McFarland tent is better known, more generally used and has given a greater impetus to the progress of restoring confidence in citrus culture, in that portion of the orange belt which has been halting between renewal and abandonment, than any other device extant. I think it has been generally admitted that the application of sufficient heat to a tree enveloped by a canvas tent will preserve the tree thus protected from any temperature experienced in this latitude. This point was established to the satisfaction of Mr. McFarland the second night of the freeze of February, 1899. When he awoke on the morning of February 13 the work of destruction had been consummated. He at once grasped the idea of protection by means of artificial heat and a tent in which to confine it. That day he busied himself in the construction of a tent and on the second night of the freeze placed it over a tree in his yard. After securing the tent, he placed inside a thermometer and an ordinary barn lantern of three-quarter-inch wick. A thermometer was also placed on the outside and a series of careful observations taken. When, after an all-night trial he took his final observation, the mercury outside showed a temperature of eighteen degrees above zero, and the atmosphere inside of the tent was thirty-four.

This was the first test that confirmed the principle, not a new one, perhaps, around which the construction of a perfect tent revolved. It was then that the real task of the inventor began. Experiment after experiment was tried and rejected, as some radical defect showed itself, or an idea proved, when worked out, to be impracticable. There were many things to consider, in order to insure its practicability for general use in large groves. In the first place it must be durable. Mr. McFarland had less difficulty with this problem than others which followed, as he was already rich in experience on this line. His twenty years of active management of some of the largest circuses in the country had taught him the proper method of treating canvas for outdoor exposure, so as to make it mildew and water proof. In fact Mr.
McFarland water-proofed the first circus tent ever treated. He was aware that mildew was the great destroyer of textile fabrics and had already found a preventative. Mildew is a fungus growth, feeding on the dead matter in the cloth, in other words, the sizing, and his first care was to remove the cause and treat the cloth in a solution that would prevent its recurrence. After the mildewing process came that of water-proofing. Canvas can easily be rendered water-proof, as there are numerous formulas for the accomplishment of that result. But to render it water-proof and at the same time durable and perfectly pliable is an achievement that has only been evolved after careful and exhaustive experiments.

**Structure of the Tent.**

These problems having been successfully surmounted, the next question was to make a tent that could be handled with the least amount of labor, in the shortest possible time. Here is where the inventive genius of the maker was brought to the severest test. After trying many ideas of his own and following out the ideas suggested by others, only to discard them as new obstacles developed, he finally hit upon the plan of a circular tent which required no guy ropes or other time-wasting devices to maintain the tent in its equilibrium in the event of wind storms. His idea was also to provide a covering that would not in any way deprive the tree of the natural conditions of sun, dew, air or moisture, and at the same time would be in a position to be quickly utilized in the event of a frost. The idea of making a tent that would depend for its support on the tree itself he discarded, as experience has proved that wherever a leaf touches the surface of the tent without any circulating air between, it will freeze as quickly as if left unprotected. In making the circular tent Mr. McFarland attached to each seam, and in the smaller sized tents between each two seams, a cypress strip, placed perpendicularly, and with the bottom ends prolonged several inches below the canvas. These ends are sharpened and, when the tent is closed around the tree, the sharpened ends are pressed into the ground and thus give additional resistance to the wind. A hoop is used around which the tent is run in closing it around the tree. The hoop is secured by stakes, nearly halfway up the height of the tent. As the lower ends of the strips are fastened in the ground and the upper ends simply attached to the canvas, they give to the wind, and have the effect of spilling it similar to a sail. The tent when not in use is clewed to an upright and can be loosed in a moment, carried around the tree and closed with a latch in ten seconds or less.

For tents of less than ten feet in height and diameter a single arm projecting to the center of the tent is used. For larger tents a double arm with a cross-piece serves the purpose. The value of time in case of the short notice a grower usually has of an approaching cold wave can easily be appreciated by the owner of a large grove. With from six to eight hours notice of the approach of a freeze, it is highly necessary that a device for protection, to be practical, must allow the covering of a large grove within that time. I read with interest in the Times-Union and Citizen of April 23 a letter from Mr. W. C. Doolland, of Belleview, relating how he saved four large trees by means of an improvised tent of his own manufacture, in which he stated that these trees he estimated would have from four to ten boxes of fruit next season.
He added, however, that the tents could be put in position in twenty-five minutes. The owner of a good grove could not afford to adopt a style of tent or any other kind of protection that would require twenty-five minutes to cover one tree.

Now, I stated at the outset that there had been a new spirit of hope regarding the future of the orange in this State, and that this feeling was the result of a confidence growing out of the belief that positive protection was no longer an experiment. As an illustration of this feeling I will cite the case of Washington E. Connor, a wealthy New York broker, who owns a sixty-acre grove in New Smyrna. Since the freeze of 1895 Mr. Connor has kept up his grove, but has not attempted anything further. During the past season he has been experimenting with protection and is now convinced that freeze or no freeze we can raise oranges in Florida. He has consequently given orders to his manager, Mr. B. F. Chilton, one of the members of this Society, to clear up an additional forty acres and set it out in orange trees.

Mr. H. M. Lytle, who owns the once famous Bodine grove of Enterprise, practically abandoned it until he saw the effects of protection of an adjacent grove. He has now replanted the grove with choice young buds and will protect them next season. Mr. G. F. Chamberlain, also the owner of property in Enterprise, has contracted to set out a new grove which he will protect.

All these indications are encouraging, but over-confidence is sometimes disastrous. For instance, several growers had sufficient confidence in the McFarland tent during the freeze of January 2 and 3 to depend upon it to save the trees without the necessary application of artificial heat. The consequence was that their trees lost their leaves, while those who lighted their lamps in time did not lose a leaf. As a matter of fact, the McFarland tent does not of itself afford protection from frost, any more than a fireplace affords warmth without a fire. It is simply designed to confine heat and this heat must be applied or the tent will fail in its purpose.

I believe that the future of the citrus family is bright with promise and that once more we will compete with the world in the production of the finest and most popular oranges ever placed on the market.