

## FROST PROTECTION OF YOUNG AVOCADO TREES

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Numerous methods of protecting young avocado trees from frost have been used in the past. The use of heaters and/or wind machines are the accepted ways to protect the trees; but for many growers, both the newcomers and the old-timers, this type of protection is too expensive for young trees if the equipment is not already owned by the growers. This means that the growers must devise a method which gives adequate protection, as well as being economical, for those first few years in the life of the trees.

In the past two years a number of plots have been established in Orange County to determine the best method of protecting young trees, besides the use of heaters or wind machines. The methods used were some of the old stand-bys of wrapping with corn stalks, newspapers, heavy paper, newspaper mats, mounding the soil up over the bud union, and then two comparatively new methods: the soil collar, where the soil is placed in a tar-paper collar around the trunk and extending above the bud union, and the umbrella type of protection.

The umbrella method formerly used by a few growers has recently been tried by additional growers who have devised their own type of covering and have gone into it quite extensively.

Figure 1 shows what one grower in Orange County has done to protect his young trees. The trees range in age from one year to three years. Figure 2 is a close-up showing the construction of the covering used. The materials used are four upright stakes placed at each corner of the tree and beyond the farthest-extended branch. The covering is a burlap sack. The sack used as a windbreak and sun shield during the spring and summer could be used as the covering for this umbrella type of frost protection in the winter, provided it has not deteriorated too much. Cheap wood scraps could be used instead of the sack if the right size is found.

It will be noted that there is no overlap on the sides. Any overlap of the covering should be on the east-west ends. The reason for this is to allow as much sun as possible to reach the plant and soil directly beneath the covering. The construction of this type of protection should be such that the covering be about four to six inches above the top of the tree. This will allow adequate sunlight to strike the greater portion of the plant. During the winter the sun is fairly low in the southern sky and as a result a covering of this type permits the absorption of heat by the plant without removing the burlap sack, or any other covering used.

The theory of this type of protection is one of creating a ceiling which will intercept or capture some of the radiated heat from the plant which occurs at night. During the day the plant and soil absorb heat; and at night, as the air cools, the plant and soil radiate

the heat stored up during the day.

If this heat can be held close to the plant during a cold night, it may be sufficient to protect the plant from damage.



*Fig.1. Frost protection by the umbrella method.*



*Fig. 2. Close-up of umbrella.*

Numerous cases have been observed where nature has provided this type of protection. After the freeze night of November 11, 1950, many blossoms on avocado trees were killed. Upon closer inspection of individual trees it was noticed that the blossoms which were in and under fairly heavy foliated branches were not killed. Only those blossoms on the outside and exposed areas of the trees were frozen. On the

nights of January 3 and 4, 1952, nature once again provided an umbrella cover for a portion of a plant and gave protection to that portion while the remainder of the plant was frozen. A poinsettia plant growing partially under a Pittosporum tree showed the difference between a protected and non-protected plant. The one branch not frozen is directly under the foliage of the tree. The distance between the tree foliage and the poinsettia branch is about six inches. All the exposed flowers and leaves of the poinsettia plant were frozen, but the protected branch showed no damage, not even on the petals of the flower. The temperature went down to 26° F.

Summarizing the above discussion, it should be said that more information is needed as to the adequacy of this type of frost protection. With the limited number of trials to date, it can be said that this method shows promise. The construction of this structure should be economical as well as convenient to erect and one which will be somewhat durable. Since this type of protection is usually done only until the trees are two or three years old, the outlay of money for an elaborate set-up is not called for.