

# METHODS OF FROST PROTECTION

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**A** VERY seasonable bulletin has been published on the above subject by the Department of Meteorology of the Agricultural Experiment Station at Cornell University, and, although it deals primarily with frosts in New York State, much of the information is of general interest and application. The following extracts may be of assistance to those who wish to protect plants and fruit trees from the disastrous effects of frost:

“For the farmer who is prepared to make practical use of a frost warning, the forecasts issued by the Weather Bureau should receive first consideration because they may be obtained early in the day, before it is possible to obtain any reliable indications from local observations as to the probability of frost. But when the warnings issued by the Weather Bureau cannot be obtained and the farmer must rely on himself, there are no instrumental readings that will take the place of a careful observation of the condition of the sky, the direction and force of the wind, and the trend of temperature.

### METHODS OF FROST PROTECTION.

The object sought in all methods of frost protection is to hold the temperature of the air in contact with the plant above the point of danger. In the attempt to accomplish this certain principles are involved:

1. Prevention or retardation of the escape of heat from the earth by the use of an artificial covering. The use of smudges as a means of protection against frost is based on this principle.

2. Addition to the air of moisture in the form of vapor, with the view of obtaining the effect of liberation of latent heat as the moisture condenses. The use of damp fuel for smudges and the spraying of fires with water have this purpose in view.

3. Heating the air by small fires.

### ARTIFICIAL COVERING.

It is a very old practice to protect plants from frost by covering them with newspapers, carpets, straw and the like. This is a most cleanly and efficient method, but unfortunately, because of the labor and expense involved, it is applicable in practice only to small areas, such as flower beds and gardens. However, by a small investment in tarred building paper the practice may be extended profitably to considerable areas.

When the paper is cut into convenient lengths and two or three strips are fastened or pasted together so as to make a strip eight or ten feet wide, which can be rolled and unrolled easily, this method may be used for the protection of a fairly large area. It affords a very convenient and efficient protection for strawberries, garden truck or small fruits. Paper of this kind can be purchased for one or two cents per square foot, and should last several years.

### SMUDGING.

Smudging, particularly when damp fuel is used, combines the first and second principles mentioned above—the prevention of the escape of heat from the ground and the addition of moisture to the air. In practice smudging has not proved a very efficient method of protection. It is used chiefly at present to shield the blossoms from the sun during the morning hours following a frost, thus preventing too rapid thawing. Spraying the frozen fruit or blossoms with water is practiced, also with the same purpose in view. It is not so much the freezing that causes injury, as too rapid thawing. It is said that blossoms may be frozen solid for hours without injury if thawed very slowly.

### HEATING THE AIR.

The most practical, efficient and economical method yet devised for protection of large areas is the direct addition of heat by means of numerous small fires properly distributed over the area to be protected.

For the farmer who desires to protect the farm orchard, this method is offered as neither difficult nor expensive. However, it does require foresight and careful preparation. The fuel to be used must be on the ground and ready for instant use. Moreover, it must be dry, so that fires may be started quickly when the temperature approaches the point of danger. A small investment in an alarm thermometer will obviate the inconvenience of remaining up at night to watch for the time when the fires must be started. These thermometers are constructed to ring an alarm bell when the temperature approaches the danger point. The alarm thermometer should be located in the coldest part of the orchard and set to ring the bell when the temperature is still a few degrees above the point of danger, so as to give time to get the fires started.

Wood, coal and oil are the fuels in use, and the choice must depend on local price and supply.