

from a few analyses with a Lunge's nitrometer, and it is proposed that this should be done. As a liberal arrangement it is also proposed that the store be thoroughly ventilated each day till the minimum apple-flesh temperature is reached, when twice a week may be sufficient, or less, according to the carbon-dioxide content shown to be in the air. The fresh air will, of course, be brought in by the fan from outside, and cooled and dried over the battery before delivery into the cool store.

The best time of day to ventilate will depend upon the weather. Two points, however, can be borne in mind. Firstly, ventilation would be the most valuable shortly before the end of the day's running, so that when the power is shut off and the chamber-atmosphere becomes stationary there would not be a large quantity of carbon dioxide or other by-products to settle or collect in any one place—for in several stores the main damage from flesh-collapse has occurred in fruit near the floor. Secondly, there will generally be a smaller percentage of moisture in the atmosphere from about 9 o'clock on to about 3 or 4 o'clock in the afternoon; but as the atmosphere cools in the afternoon, and on through the night, the percentage of moisture in the atmosphere will increase even to the point of precipitating dew.

#### *Humidity.*

It has not been suggested that humidity in itself is connected with flesh-collapse; nevertheless, it is quite certain that a little more attention to this factor will make for more favourable conditions to apples in cool store. For example, the average natural relative humidity at Nelson from May to September is 82, while cool stores are more often found to be at or close to saturation-point, or 100. Outside, with a relative humidity of 82 and a mean temperature of 48°, apples will keep without shrivelling in an ordinary shed till the end of August. With an apple-flesh temperature of 32°, they would keep longer in a relative humidity of 82 without shrivelling. At a relative humidity of 100, however, there is little chance of the apple disposing of any water, and any slight drop of temperature would result in the precipitation of moisture on any cold surface, and a consequent development of mould.

Now, shrivelling is not dependent entirely upon temperature and humidity. The apple itself as it becomes mature develops certain mechanism for the conservation of its water content. As, however, it is shown that too advanced maturity favours flesh-collapse, and there may consequently be a tendency for some growers to select fruit too much on the immature side, it would be wise to aim for a humidity a little above 82. I therefore propose a relative humidity range of 90 to 95, to be maintained during the hours of running. The use of the wet- and dry-bulb thermometers will show whether or not this is being accomplished. The collection of moisture from the atmosphere may be increased by increasing the rate of circulation, which will enable the battery-pipes to be run at a lower temperature without reducing the temperature of the discharge. This increase in the cooling-power of the plant per hour will result in a reduction of the number of running-hours per day.