

## **EFFECT OF TEMPERATURE ON THE RIPENING OF HASS AVOCADOS**

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In a study of the maturity of avocados it is essential to know how the fruit is affected by environmental conditions after it has been harvested. In fact, one of the criteria that can be used as an indication of maturity is whether the fruit can be ripened into an acceptable product.

The factor singled out for the present investigation was temperature. It is well known that the ripening of avocados is delayed at reduced temperatures, but it is not so well known how the fruit responds to elevated temperatures.

### **PROCEDURE**

Mature Hass avocados were picked on July 24 and placed at 12 constant temperatures covering the range from 6°C (42.8°F) to 39°C (102.2°F). Eight lots of eight fruits each were stored at each temperature. All fruits were weighed at the start and pressure tests were made on the flesh of one lot for an initial value. Pressures were determined in grams for the force required to sink a plunger with a diameter of 1.143 mm (0.045 inch) into the flesh of a small cylinder of the fruit (skin removed). Generally, a pressure as low as 10 grams or less was required before the fruit was ripe enough to eat.

At intervals, a lot of fruit was sacrificed at each temperature to determine the progress in ripening.

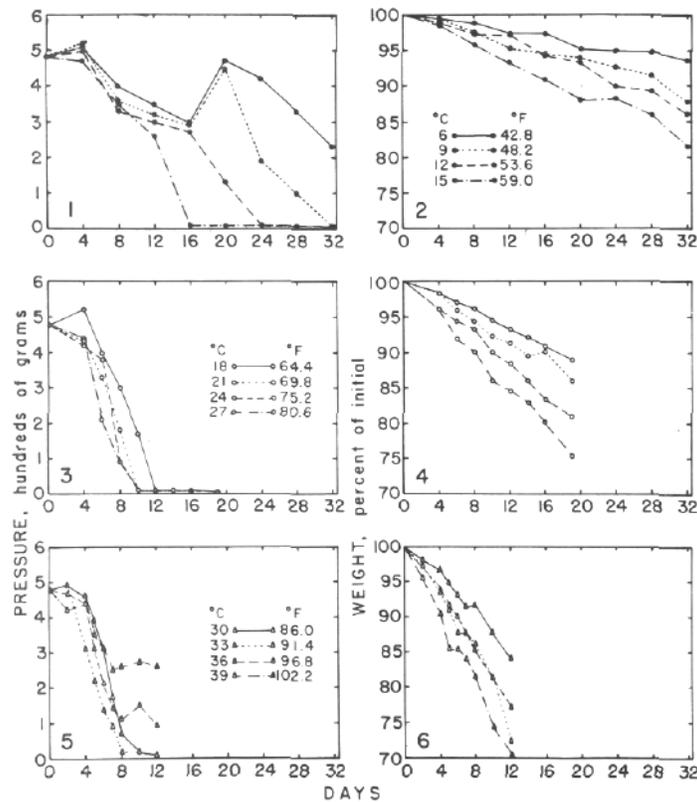
### **RESULTS**

The results of the pressure tests and the weighings are summarized in figs. 1-6. Relative humidities were determined, but not controlled, at the various storage temperatures (table 1).

Table 1. Relative humidities at the various storage temperatures.

Temperature, °C	Relative humidity, %
6	73
9	55
12	53
15	42
18	57
21	54
24	49
27	44
30	41
33	38
36	34
39	25

At the lowest temperature, 6°C (fig. 1), the fruit did not ripen within the time limits of the experiment (32 days). However, at 9°C, all 8 fruits of the sample which was tested after 32 days were ripe enough to eat, while only 1 out of 8 was ripe at the 28-day sampling.



Figures 1-6. Pressure changes and loss of weight of Hass avocados stored at various temperatures.

The time required for the fruit to ripen was progressively shortened with higher temperatures up to 21 °C (figs. 1 and 3). At the latter value and for temperatures up to

an including 27°C, the time required for all fruit in the sample to ripen was 10 days.

At 30° and 33°C (fig. 5) although the average pressures seemed to decrease more rapidly than at lower temperatures (fig. 3), the ripening was more irregular, and even after 10 days not every fruit in the samples was soft enough to eat. The erratic behavior was accentuated with increased temperature and the flesh of the fruit was seriously darkened at 33°C and above.

The loss in weight was progressively greater at the higher storage temperatures (figs. 2, 4 and 6). Probably if equal relative humidities had been maintained at all temperatures, the differences in loss of weight would have been reduced considerably. Shriveling began to be noticeable to the touch when the loss in weight was somewhere between 5 and 10 percent of the fruit weight.

## **SUMMARY**

The optimum temperature for ripening Hass avocados fell between 21° and 27°C (approximately 70° to 80°F). In considering both the time required for ripening and the loss in weight during ripening, in the absence of any humidity control, the most satisfactory temperature was considered to be 2PC (approximately 70°F).