

FIRMNESS LOSS IN GINGERGOLD APPLES

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JUSTIFICATION

Gingergold apples are a popular new early season variety. Questions have arisen about the storage potential for this variety. Researchers at University of Massachusetts suggest that Gingergold apples have only a 4 to 5 week storage potential after which the flesh become grainy and undesirable when it softens to 12 lbf or lower. They suggest that “it should be sold before the high-quality and better storing Golden Delicious types are harvested.”

This experiment was conducted to determine the storage potential of Washington grown Gingergold apples.

METHODS

Ten boxes of Gingergold apples (two boxes from five different growers) were obtained shortly after harvest and packing on August 24, 2001. Apple sizes ranged from 88 to 113. Fruit was placed in a cold storage room at USDA-ARS at ~32 °F. A 40-apple sample from each grower lot was removed from storage at 20, 40 and 65 days and evaluated. In addition, a sample was evaluated prior to storage (harvest). Each sample was divided into lots of 20 apples for evaluation one day out of storage (OFS) and 7 days OFS.

Evaluation included Magnus-Taylor firmness measurement taken on two shoulders of each apple using the Fruit Texture Analyzer (FTA). Additionally, pictures of fruit lots were taken and topical disorders and damage were observed.

RESULTS AND OBSERVATIONS

There was a rapid decline in lot average firmness of the Gingergolds during storage, from an average of firmness of 16.6 lbf at harvest to 12.1 lbf after 65 days. Figure 1 shows the 1-day firmness at harvest, 20 days, 40 days and 65 days out of storage.

During the 7-day-ripening period there was a dramatic decline in Gingergold firmness at harvest and after 20 days in storage (Figure 2). After 40 or 65 days in storage the fruit did not lose much firmness during the ripening period. Each line in the graph represents apples removed from storage on a specific date. The point situated higher on the graph indicates data taken one day out of storage (OFS) and the second point indicates data taken 7 days OFS.

Table 1 shows the lot average firmness at each sample date. These firmnesses are presented in order from high to low, and are followed by a letter “rank” indicating the statistical difference between values.

Figure 1. Lot average firmness of Gingergold apples one day out of storage.

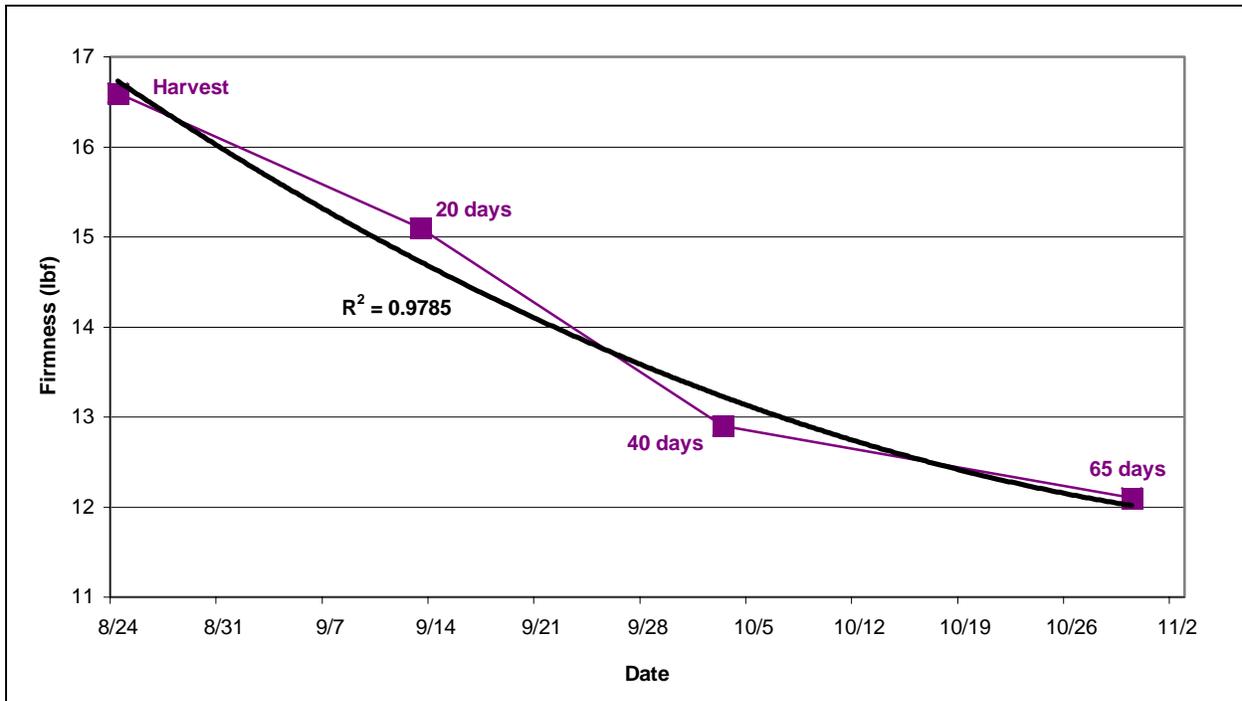


Figure 2. Firmness of Gingergold apples one day out of storage and allowed to ripen at 70 °F for 7 days.

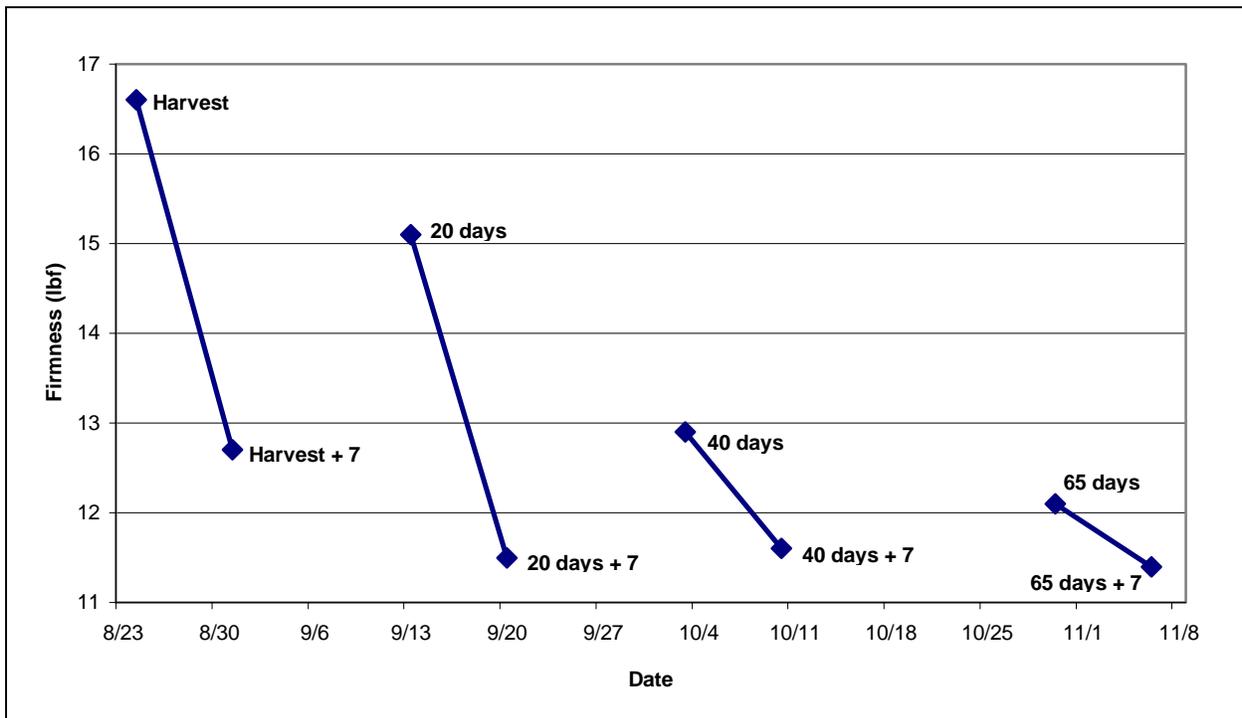


Table 1. Gingergold lot average firmness at different dates out of storage.

Storage	Firmness (lbf)	Rank
Harvest	16.6	a
20 days	15.1	b
40 days	12.9	c
Harvest + 7	12.7	c
65 days	12.1	d
40 day + 7	11.6	de
20 day + 7	11.5	e
65 day + 7	11.4	e

Some external disorders were apparent at all storage removal dates. After 20 days in storage a number of the ripened apples (7-day OFS) developed a brown bruise-like appearance over a large area of the fruit, although the flesh was not soft (Photos 1 and 2).



Photos 1 and 2. Gingergold after 20 days in storage at 32 °F and 7 days ripening at 70 °F.



Photo 3. Gingergold after 40 days in storage at 32 °F and 7 days ripening at 70 °F.

These symptoms were much less prevalent after 40 days of storage. Some decay was present after 40 days in storage (Photo 3).

After 65 days symptoms similar to those at 20 days appeared, although they were less severe. The flavor and aroma of apples removed after 65 days of storage was overwhelmingly strong.

CONCLUSIONS

Gingergold apples lose firmness very rapidly during ripening at harvest or following a short storage regime. At harvest they can lose as much as 4 lbf firmness in 7 days if held at 70 °F. In comparison, they lost only 1.5 lbf firmness in a 20-day period when stored at 32 °F.

Gingergold apples stored for 65 days in air developed off flavors, aroma and flesh breakdown. After only 40 days some decay appeared.

The results of this experiment mimic that done at the University of Massachusetts. It appears that Gingergolds should be sold as soon after harvest as possible. Fruit should be kept cold since firmness loss is extremely rapid at warmer temperatures.

LITERATURE CITED

Duane W. Greene, Autio, W.R. and Krupa, J. 1999. Storage and shelf life of several promising late summer maturing apple varieties. *Fruit Notes*, V 64 (4): 4-7.