

## **EVALUATION OF CONTROLLED ATMOSPHERE STORAGE OF PUMPKINS**

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### Introduction

Controlled atmosphere (CA) storage of fruits and vegetables has been shown to be effective with several commodities. Vidalia onion growers have used this technology to extend the availability of their onions. Pumpkins cannot be reliably produced in the Southeast for fall markets because of the high pressure of aphid transmitted viruses. The University of Georgia has developed a virus resistant pumpkin, 'Orange Bulldog', but it is a related species, not the standard pumpkin type.

CA storage may be an opportunity to grow standard pumpkins in the spring/summer and have them available for fall sales. The objective of this study was to evaluate several pumpkin varieties for storage under CA and ambient conditions.

### Materials and Methods

Sixteen fruit (4 from each replication) of 10 pumpkin varieties were collected from a variety trial at the Vidalia Onion and Vegetable Research Center on 9 Aug. 2007. Eight of the fruit for a specific variety were held under ambient conditions while 8 fruit were placed in CA storage with 3% O<sub>2</sub>, 5% CO<sub>2</sub>, 50°F, and 60% relative humidity.

Pumpkins were held in CA until 1 Oct. 2007 when they were removed and evaluated for marketability and disease damage. Pumpkins held under ambient condition were periodically evaluated and rotten fruit disposed of. Pumpkins were evaluated into one of three classes, 1-marketable, 2-some fruit damage, and 3-unmarketable.

Data collected were evaluated with non-parametric Mann-Whitney and Kruskal-Wallis tests.

## Results and Discussion

CA stored pumpkins stored significantly better than those stored under ambient conditions (Table 1). The presented data does not convey how dramatic the difference was. Almost all of the pumpkins stored under ambient conditions rotted before the CA pumpkins were evaluated. There are some problems with CA storage with fungal growth appearing around and on the pumpkin stem. It may be possible to surface sterilize this area prior to CA storage with either alcohol or chlorine solution.

There were no differences among the varieties stored under CA conditions (Table 2). Pumpkins stored under ambient conditions, did show differences between the varieties with 'Orange Bulldog' having the lowest value rating.

In conclusion, CA storage of pumpkins shows promise as a method for growers in Georgia to have pumpkins available for fall markets. It is probably not economic for such facilities to be used exclusively for pumpkins, but the large number of CA facilities in the Vidalia onion growing region could be used to store pumpkins as an added revenue source.

Table 1. Effect on controlled atmosphere on pumpkin storage.

Treatments	Evaluation <sup>z</sup>
Controlled atomsphere	1.8
Ambient conditions	2.2
Mann-Whitney Test	0.000

<sup>z</sup>Evaluation: 1-Marketable, 2-some damage, 3-unmarketable

Table 2. Pumpkin variety evaluation with and without controlled atmosphere storage.

Variety	Evaluation <sup>z</sup>	
	Ambient conditions	Controlled atmosphere
PMK-06-04	2.4	1.6
PMK-02-03	2.0	1.5
PMK-06-02	2.1	1.5
PMK-06-01	2.9	1.5
PMK-06-05	2.0	2.1
Gold Medal F1	2.6	2.0
Red Eye	2.0	2.0
Gold Challenger	2.3	2.3
Alladin	2.3	1.9
Orange Bulldog	1.8	1.9
Kruskal-Wallis Test	0.013	0.205

<sup>z</sup>Evaluation: 1-Marketable, 2-some damage, 3-unmarketable