

Long-Term Apple Storage Remains Core Research

UNIVERSITY PARK, (Centre Co.)—Researchers in Penn State's College of Agricultural Sciences have established guidelines for long-term storage of apples that could allow Pennsylvania food processing firms to take a bigger bite of the product pie by responding more quickly to consumer desires.

According to George Greene, associate professor of pomology at Penn State's Fruit Research and Extension Center in Biglerville, better understanding of how different varieties of apples hold up in storage can save thousands of dol-

lars in fruit losses per year for processors. In addition, long-term storage allows firms to keep adequate supplies of fruit on hand to respond to the demands of the marketplace.

Controlled atmosphere (CA) storage extends the shelf life of fruit in two ways. First, lower temperatures (approximately 32 degrees Fahrenheit) retard ripening and reduce water loss. Second, lowering oxygen levels and raising the level of carbon dioxide in storage rooms enables fruit to be stored for up to 12 months.

"Before controlled atmosphere

storage, processors would finish most of their canning by December or January, trying to predict what types of products consumers would buy six to 10 months into the future," Greene said. "With CA storage, processors can delay investment in cans, labels, sugar and other components until the company needs the finished goods. They can also make better marketing decisions."

"In CA storage research, we try to find the combination of temperature and gas levels that best maintains firmness or crunchiness, juiciness and flavor," Greene said.

The researchers at the fruit lab have done extensive work with the main apple varieties used in fruit processing: York Imperial and Golden Delicious. Greene adds that the lab also tests a wide variety of apples marketed to grocery stores, such as Red Delicious and Rome.

"As new apple varieties for fresh eating or for processing are developed, we test them to find what conditions are best for long-term storage," he said. "Now we're working on two new varieties of fresh market apples: Fuji and Braeburn."

Although Penn State does

extensive research on fresh market apple storage, Greene explains that Pennsylvania's fresh market apple industry is less concerned with long-term storage than other state's apple growers because many packers are finished by April or May. In addition, Pennsylvania producers do not ship fruit long distances as do producers in Washington, for example.

Although controlled atmosphere storage has been used since the 1960s, Penn State's research indicates that growers and packing plants can still improve how they store their fruit before shipping or processing.

For instance, different varieties of apple may require separate atmospheric values for best results. Typically, fruit packers have two large controlled atmosphere storage rooms. Greene points out that dividing larger rooms into smaller areas where each variety of fruit can be given the optimum atmospheric mix of gas and temperature will result in higher quality fruit and less post-harvest loss due to spoilage.

"Another advantage of dividing storage rooms is that it would make it possible to get apples into CA storage that much quicker," Greene said. "If growers are picking 1,000 bushels a day and storing them in 10,000-bushel rooms, it would take only 10 days to start CA storage. If you have a 30,000-bushel room, it will be a month before you can start CA storage."

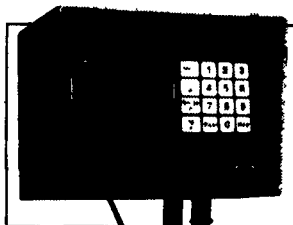
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