SAFEPOD INTRODUCTION

There are two types of fruit: climacteric and non-climacteric. Climacteric fruits such as apples, bananas, and pears ripen after harvest. Cherries, berries, citrus, and most stone fruit (peaches, plums, etc.) are non-climacteric.

The ripening of climacteric fruit is associated with ethylene and increased cellular respiration. For this reason, when we store climacteric fruit, the fruit is harvested early (when starch levels are high and before flavor has fully developed) because we know the fruit will ripen after harvest. In contrast, if you harvest a strawberry or other non-climacteric fruit early, it will ripen no further.

Once fruit is harvested, the aim of storage is to delay the ripening of the fruit. The two primary methods of accomplishing this are decreasing the temperature and lowering the oxygen in order to reduce the respiration rate of the fruit. Slowing the respiration rate of the fruit slows the speed at which the fruit ripens.

Historically, the temperature and oxygen setpoints were determined either by research organizations or by trial and error. These setpoints have a significant 'safety margin' to prevent any damage to the fruit. They were also determined at a time when going below 2% oxygen in a store was difficult, and the industry was not storing apples as long. Over time, researchers have discovered that storing at lower oxygen (less than 1% in many cases) can significantly reduce browning disorders and increase the storage life of the fruit. However, if the oxygen levels become too low, injury to the fruit can occur. One way to determine the low oxygen limit was by measuring chlorophyll fluorescence. This fluorescence can determine when an apple is stressed by looking for components in the peel that change when the apple becomes anaerobic and starts to produce alcohol. The unfortunate concern is that while the Low oxygen limit is determined, the entire room's fruit is under the Low O2 stress. The SafePod, however, allows a micro environment, working like a capsule inside the room. By manipulating the patented Isolated or Shared action of the SafePod, a low oxygen limit can be determined while only looking at its representative sample of fruit. The entirety of the room's fruit, worth hundreds of thousands of dollars, is kept at a safe oxygen level. The Safepod helps an operator accurately determine the room's best atmospheric setpoint by only exposing the 4 bushels to the low oxygen. This test is performed automatically several times throughout the storage period to verify the limit, of course, worry free.

Now perhaps the most revolutionary thing about the SafePod is its ability to measure respiration rate of the fruit and how it shows that fruit respiration rate in response to the controlled atmosphere environment. Respiration is measured by the oxygen and carbon dioxide sensors inside the sealed SafePod, as we know the given volume of the SafePod and the weight of the fruit inside it. Once sealed, we monitor continually the fruit's respiration response to decreases in oxygen. **When the respiration rate increases, we know the fruit is moving towards the end of its storage life. This information allows us to profile rooms and rank marketing order throughout the winter months, and to extend storage life of the fruit by up to 10+ months!** Another use of Respiration in conventional CA storage, which is patented and exclusive to the SafePod, is to indicate when 1-MCP effectiveness is decreasing (because respiration is increasing). All this makes us realize that with SafePod technology a new phrase of "Intelligent CA" is more appropriate than the previously coined phrase "Dynamic CA".

More information is available at storagecontrol.com/press.

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