Pondering the future of fruit in a climate-challenged world: Can we grow fruit without trees?

Plant Cell Culture technology utilizes the ability of a single plant cell to produce multiple cells. In the lab, we can influence these cells to become a cell from different parts of the plant: a fruit cell, a leaf cell, or a root cell—provided we give the cells the right nutrients and plant hormones.

To make these cells, scientists place a small part of the plant in a nutrient medium with specific plant hormones. They are then incubated at optimum temperature and light.

Within weeks, a mass of proliferating new cells (called a callus, as shown in the picture) is formed.

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A group of researchers at the VTT Technical Center in Finland produced cell masses of cloudberry (Rubus chamaemorus), lingonberry (Vaccinium vitis–idaea), and stoneberry (Rubus saxatilis) in the lab using PCC technology. More recently, they’ve produced cell masses of Rowan (Sorbus aucuparia) and Arctic Bramble (Rubus arcticus).

In their initial analysis, they concluded that the samples had flavors that resembled the fresh fruits. In fact, the flavor in dried samples was even more intense than in fresh samples. The nutrient content of the fruit cells was even better than the fruits growing on the plants!

Similarly, researchers at Plant and Food Research, New Zealand, are working with cells of fruits such as blueberries, apples, cherries, feijoas, peaches, nectarines, and grapes. They are working on culturing plant cells in the lab to grow fruit from the cells, without a tree. The goal is to create a cell-based fruit that has the texture, appearance, and taste of fruits that we are familiar with. This program was started less than two years ago and we are still waiting for the results.

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