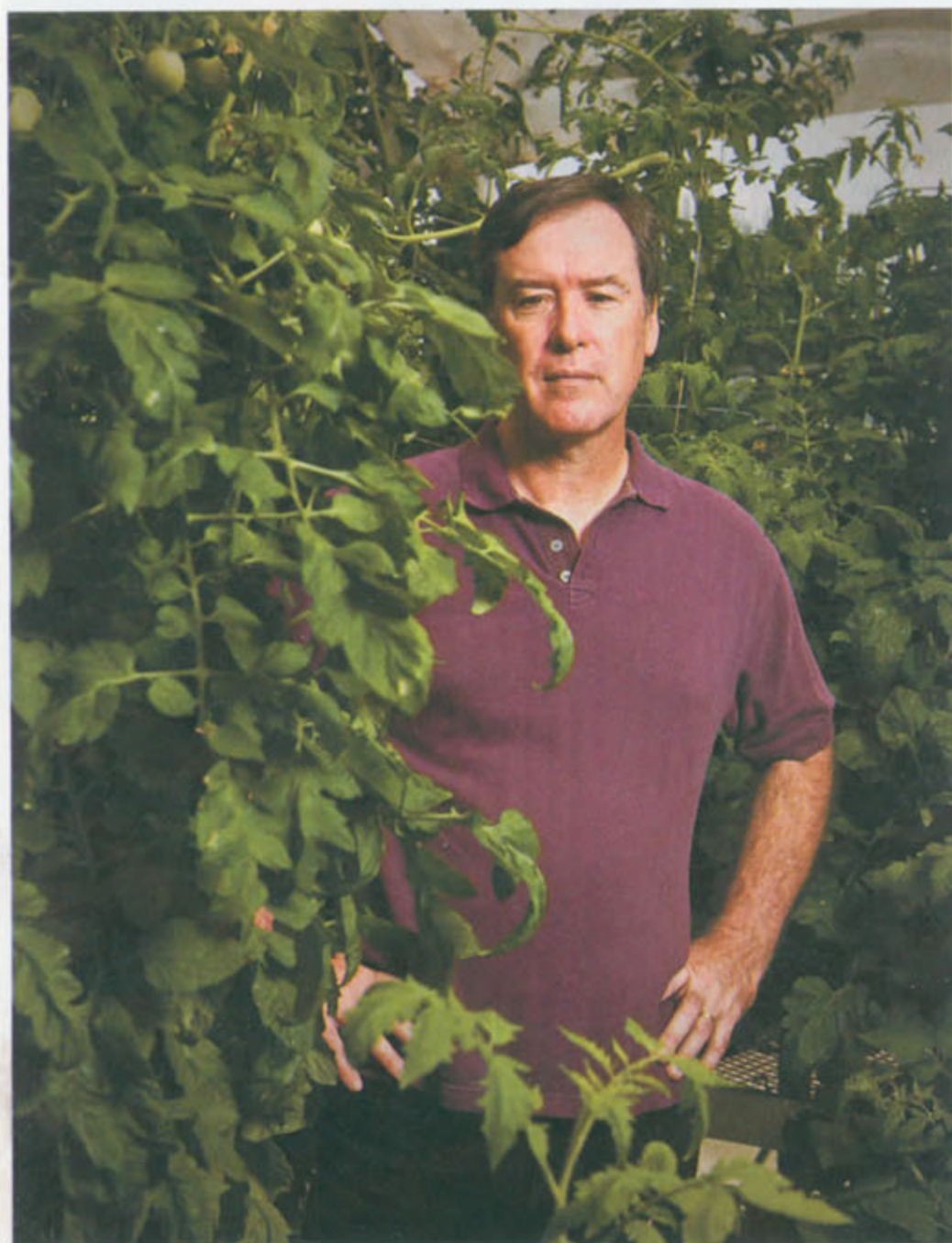


To get Florida tomatoes, which have traditionally been bred for size and durability, to Northern shoppers, the fruits are usually picked as hard and green as Granny Smith apples, packed in boxes, warehoused and exposed to controlled doses of ethylene gas, a ripening agent, so they turn red just in time for sale. Farmers often get a premium for big tomatoes. (On the day I visited the DiMare Inc. operation near Ruskin, Florida, the market was \$14 for a 25-pound box of extra-large tomatoes, \$10 for medium tomatoes.) The consumer consensus is that these tomatoes don't taste like much; 60 percent will end up in fast food, sliced thin for burgers and subs or chopped into the salsa that garnishes tacos and burritos. Along the way shippers and shoppers frequently refrigerate them—a no-no that ruins the texture and what little flavor they started with.

Some academic specialists are trying to improve the



may be bland or insipid. You need acid to go with the sweet," says Scott. "But if acids are too high, you can't perceive the sweet. So it's a balance. And it's better when both are high."

That's hard to achieve in a big tomato, though, because "you've maxed out the plant's ability to produce sugars and other flavors," says Harry Klee, a biochemist at the university's Gainesville campus. The subtleties of tomato flavor derive mainly from about 20 of the 400 volatile chemicals in the fruit's flesh and juice. Klee and his co-workers are using genetic engineering techniques to enhance some of those key volatiles to improve the flavor of commercial tomatoes. It's a peculiar task, this job of trying to make bland tomatoes taste good.

I visited Klee's laboratory to taste a fresh transgenic tomato that his colleague Denise Tieman had produced. Using a technique developed in the 1980s by Monsanto, Tieman and

While everyone complains about the bland taste of Florida tomatoes, Harry Klee (in his University of Florida lab hothouse) is actually trying to do something about it.

a graduate student endowed a tomato with a gene that enhances production of methylsalicylate, a compound better known as oil of wintergreen, a natural volatile component of tomatoes. Tieman fed me a slice of ripe tomato from one of the transgenic plants. It had a flavor

that I associated, at some level, with freshness, but it was not particularly good. Tieman fed me another transgenic variety that had 50 to 100 times higher than normal levels of another volatile tomato flavor component, phenylacetaldehyde—the familiar rose oil odor of cheap perfume, bath soaps and detergents. The DNA containing this gene was recovered from *Solanum pennellii*, a tomato native to Peru. The smell was intense—and not pleasant. The tomato left an aftertaste of a lady's powder room on the roof of my mouth. "You wouldn't really want a tomato to taste like that," Tieman says. But like the wintergreen tomato, she added, "it proves that you can alter these flavors." If any of the transgenic tomatoes prove promising, Klee says, traditional breeding techniques might be developed to produce them, obviating concerns about eating a genetically engineered food.

Whether Klee and other flavoristas succeed or not, we can take comfort in the tomato's continuing, explosive diversity: the U.S. Department of Agriculture has a library of 5,000 seed varieties, and heirloom and hybrid seed producers promote thousands more varieties in their catalogs. Scott has developed a variety he thinks can challenge the heirlooms for flavor, at an affordable price, if only he can convince some Florida growers to plant it and pick it closer to ripeness. He calls it the Tasti-Lee. I haven't sampled it yet, but I'm growing some of Scott's seeds this summer, along with 12 different heirlooms, a yellow tomato from Siberia, wild cherry tomatoes from the mountains of Mexico and sugary-sweet grape tomatoes. It's fun, though I'm strictly an amateur. If they get moldy or eaten by bugs, I know I can find good ones at the farmer's market. With tomato growing, as in other walks of life, sometimes the professionals know more than we give them credit for. ○

dispiriting state of the Florida tomato. Jay Scott, of the University of Florida's Gulf Coast Research and Education Center near Tampa, has contributed to the development of many tomato varieties found at supermarkets around the country. Seeds from a dwarf tomato he bred, the Micro-Tom, even flew on the space shuttle *Endeavour* in 2007 as part of an experiment to test the practicality of growing food on long-haul space missions. The flavor of tomatoes, Scott says, comes from sugars, acids and volatile chemicals. Photosynthesis generates sucrose, or table sugar, which is broken down into glucose and the sweeter fructose during ripening. The concentration and balance of glucose and fructose determine the degree of sweetness. Acidity comes mostly from citric and malic acid. "If you have a tomato without many acids, it