

step out *feast your eyes*

BY JUDE STEWART



BRILLIANTLY COLORED, EVERYDAY VEGETABLES HIT THE MIDDLE-MARKET.

Dig it: slender, purple asparagus spears. Red-and-yellow-zigzagged Tigger melons. Honest-to-Jim black Kumato tomatoes. And a peacock-spray of new carrot colors, shading from deep purple, black, red, yellow, to a ghostly white. The list runs crazily down the full Crayola 64. Gardeners, when you're fed up this winter and ready to plan your plot early, be prepared to dream in full color.



Seed markets and supermarkets are awash in the latest wave of democratized design—"designer" vegetables. Unlike twee foodies-only strains of the past, recent crops include sturdy, everyday foods like cauliflower, potatoes, and carrots derived by natural breeding methods and sold at affordable price points. New strains also emphasize utility *and* beauty, drenched with antioxidants, lycopene, and higher vitamin counts as much as with color.

While breeding new colors of vegetables is not new, "what is definitely new is the broader acceptance and [consumer] demand," says Philipp Simon, research geneticist for the USDA's Agricultural Research Service (ARS) and professor of horticulture at the University of Wisconsin. "Previously there was a fairly narrow view by grocery store purchasers as to what we should be able to buy." He credits home gardeners' zeal for ethnic or unusual vegetables, coupled with broader variety of seeds available through the internet, as key factors. Whatever spurred the trend, *National Geographic* and science columns internationally agree: Consumer-centered design has finally reached the supper table.

WHAT'S UP, DOC?

Turns out, plant geneticists mull over much the same problems as any industrial designer: Dr. Simon and his colleagues consistently search for fresh forms throughout the world, and then recombine those forms to satisfy a big list of technical and marketing demands from producers, distributors, nutritionists, and now end-consumers. "My mandate is to look further down the line and ask, 'What does everybody in this pipeline—consumers, growers, nutritionists, my colleagues—need 20 years from now?'" As lead researcher of the largest carrot project in the U.S. public sector, Simon's team introduced a darker-orange carrot in 1978 with 75 percent more beta-carotene; it is still one of the most widely available carrot varieties in the U.S. market. "A broad diversity of crops

ORIGINALLY PLANTED BY SOUTHWESTERN NATIVE AMERICANS, RED CORN BOASTS A HIGHER PROTEIN CONTENT AND A RICH, ALMOST NUTTY FLAVOR. BOILING TURNS THE KERNELS BLUE; ROASTING TURNS THEM MAROON; AND MICRO-WAVING YIELDS PURPLE.



is always a good thing, genetically—especially for disease resistance,” he remarks, “but that diversity is not without its challenges, growing in particular.”

Simon started working with unusually colored carrots to promote genetic diversity in existing orange carrots, only to learn from nutritionists that the colors themselves imparted unexpected nutritional benefits. Red carrots derive their color from lycopene, a type of carotene believed to prevent heart disease and some cancers. Yellow carrots contain lutein, a compound that fights macular degeneration in the retina, and xanthophylls, pigments similar to beta-carotene that promote healthy eyes. Purple carrots are full of anthocyanins, a powerful antioxidant, while white carrots are fiber-rich.

Talking with Dr. Simon, I was suffering from two common delusions: First, I assumed that there are only a handful of all-orange carrot varieties in nature, which lead to the second mistake, presuming startling new colors must spell iffy genetic modification (GMO) somewhere along the line.

Simon confirmed that my reaction was typical in an informal public test of his carrot varieties at the Pike’s Place farmers market in Seattle: “The first two questions people asked were ‘Is it safe?’ and, ‘Are they natural or genetically modified?’ Some adults would say, ‘I can’t put a purple carrot in my mouth, that’s just not right.’ But kids always tried them.” A promising sign for weary moms the world over. Contrary to all the GMO fears, Simon’s

business involves finding far-flung natural varieties of vegetables and cross-pollinating them with popular commercial breeds. The result: diversity and its corollary, genetic strength. Unlike GMO soybeans, cotton, and corn, in which a foreign microbe is injected directly into the plant’s chromosomes, “we typically use only genes within the plant we’re working with.”

Breeding carrots just means taking pollen from a male plant and sprinkling it on a female’s flowers, Simon explains. After this yenta maneuver to mate two unfamiliar plants, Mother Nature takes over to produce offspring naturally. As a marketing move, going non-GMO calms consumer fears and opens up the more adventurous organic-foods market.

RIDING OUT THE BUMPS

Like any industrial design, each new vegetable posed its own technical obstacles to production. “You come to appreciate all the breeding that goes into commercial varieties of carrots,” Simon remarks. “We were fascinated by dark purple carrots from Turkey, but back in Wisconsin, they literally melted in the face of sclerosia, a pathogen that attacks many carrots but not orange ones. We didn’t even know this disease was still around.” Purple carrots are also vulnerable to nematodes, a family of roundworms, although Simon hopes to breed in natural resistance and so reduce future pesticide use. Dr. Peter Falloon, inventor of Pacific Purple aspara-



TOP LEFT: PURPLE ASPARAGUS TENDS TO BE SWEETER AND MORE TENDER THAN GREEN OR WHITE VARIETIES. ITS PURPLE COLOR COMES FROM THE ANTIOXIDANT ANTHOCYANIN, BELIEVED TO FIGHT CANCER AND SIGNS OF AGING.

BOTTOM LEFT: BOOSTED LEVELS OF BETA-CAROTENE MAKE THIS CAULIFLOWER RICHER IN VITAMIN A—AND GIVE IT ITS ORANGE HUE.

RIGHT: A WIDENING RAINBOW OF TOMATO VARIETIES ALSO WIDENS THE RANGE OF TASTES AND COLORS AT THE TABLE.

gus at Aspara Pacific in New Zealand, describes similar struggles: “One of the biggest problems is that Pacific Purple is a tetraploid,” with two pairs of each chromosome instead of the usual diploid with one pair. “If you inbreed [a tetraploid] for too many generations by crossing related parents, the progeny suffer from genetic defects that may result in death. A little like the British royal family and hemophilia.” To overcome this, Falloon used all the purple-producing parents for his seed blocks instead of sticking with one or two, a complicating logistical maneuver but one that kept his plants vigorous from diversity.

And then there are the aesthetic bumps: Water-soluble purple carrots still tend to bleed alarmingly onto the hands, while “red carrots taste really bad when eaten raw,” Simon admits, “and white ones are pretty bland.” No matter that both taste fine when cooked: Like any innovative design on an existing product, new carrots must contend with consumer expectations and ideally taste good raw, juiced, or cooked.

TASTE THE ROMANCE

Another marketing plus: the distinctly romantic whiff each product gets from its remote origins. Scientists discovered Tigger melons in an Armenian mountain valley, red kiwis in remote parts of China, and red bananas in Ecuador. Black Kumato tomatoes are rumored to enhance the sex lives of tortoises in the Galapagos Islands. Purple asparagus originated as a spontaneous mutation in

northern Italy 300 years ago. Yellow and purple carrots date from 900 A.D. in Afghanistan and dominated markets from the Middle East to Europe until orange-mad Dutch popularized orange carrots in the 16th century. Today, purple carrots are sold in Turkey for pigment or mixed with turnips for a popular summer drink; you can also buy red carrots in New Dehli and yellow carrots in Syria, North Africa, and Beijing.

It’s too early to gauge market acceptance for these vegetables, but early signs are promising. According to Falloon, Purple Pacific sells briskly in the UK and Japan; purple, yellow, and red carrots have been sold at UK grocer Sainsbury’s for three years, at only 10 pence more per half-kilo bag than orange ones. The All-America Selection chose the “Purple Haze” carrot as one of 2006’s best new vegetables, and leading seed catalog Burpee’s offers purple, red, and white carrots as part of its featured lineup to American gardeners this year.

Simon—a man for whom carrot-love runs deep and strong, to say the least—seems confident that colorful carrots will make it big somehow. “People used to think, carrots are carrots are carrots, but that’s changing.” He muses aloud about possibilities: a new product category, like the baby-carrot innovation in recent years? The next deep-orange mainstay? Or a Frankensteinian, perhaps embarrassing flop? I can almost hear his smile crackle over the phone wire. “Carrots are very durable, they’re tough, and easy to handle—and not just genetically.” No worries here. 🍷