



Totally RED

Swiss nursery owner and fruit breeder Markus Kobelt hit the headlines across Europe with the latest apple varieties he released. They are among the first red-fleshed apples in the world to go into commercial production.

Kobelt, who owns the Lubera nursery, at Buchs, near Lake Constance, has been breeding apples and small fruits since he established the business in 1993. The main focus has been producing potted trees for home gardeners (since in Switzerland many people grow tree fruits and berries themselves at home), but the red varieties are being sold to commercial growers.

New apple varieties developed by Swiss breeder Markus Kobelt are red from the skin to the core.

by Geraldine Warner

From the beginning, Kobelt was interested in developing new apples with red flesh. He had contacts with active apple-breeding programs in eastern Germany and the Czech Republic from which he was able to obtain material to make crosses.

The red-flesh trait originated primarily in crab apples. Although there are multiple sources of the trait, many are not very productive in breeding because of poor flavor, Kobelt said. It took a large number of crosses and many rejects before he was able to create progeny that had the red flesh along with all the other characteristics that make an apple appealing to consumers. "That's the reason we had to work with big populations, to find some where the sugar is coming more in the foreground," he said.

Novel

Kobelt said that new varieties for home gardeners must have good flavor and eating quality, must be easy to grow, and must be novel in some way. Everybody wants something special.

Those same characteristics are also important in apples produced by commercial growers, with the addition of good shelf life and storability.

Kobelt has developed six red-fleshed varieties, which he believes have potential for the commercial apple industry as well as home gardeners. They were selected five years ago and have been tested with second-generation trees and bigger plantings.

"We're going forward very fast, perhaps a little faster than with the normal breeding programs," he said. "It's exciting to be the first on the market with good and acceptable fruit quality."

His earliest variety matures in mid-August and the latest in early October in Switzerland. Some of the varieties have a tart flavor reminiscent of Elstar, but the

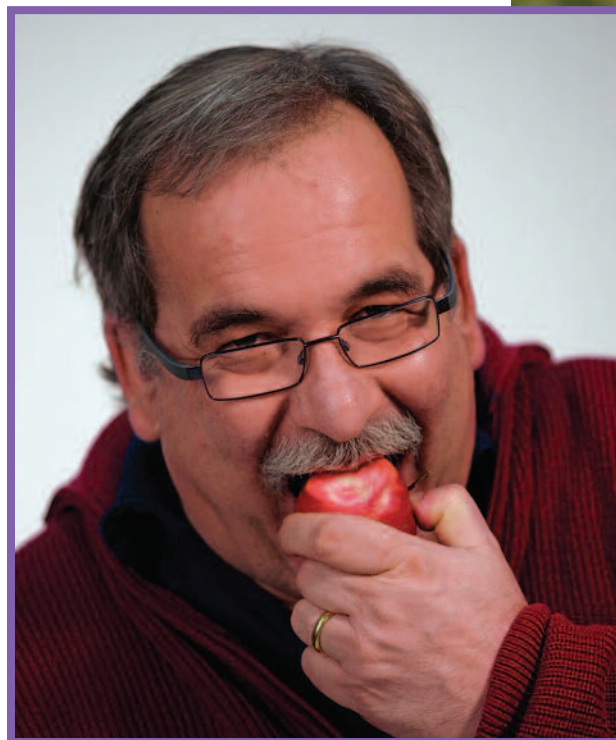
"It's exciting to be the first on the market with good and acceptable fruit quality."

—Markus Kobelt

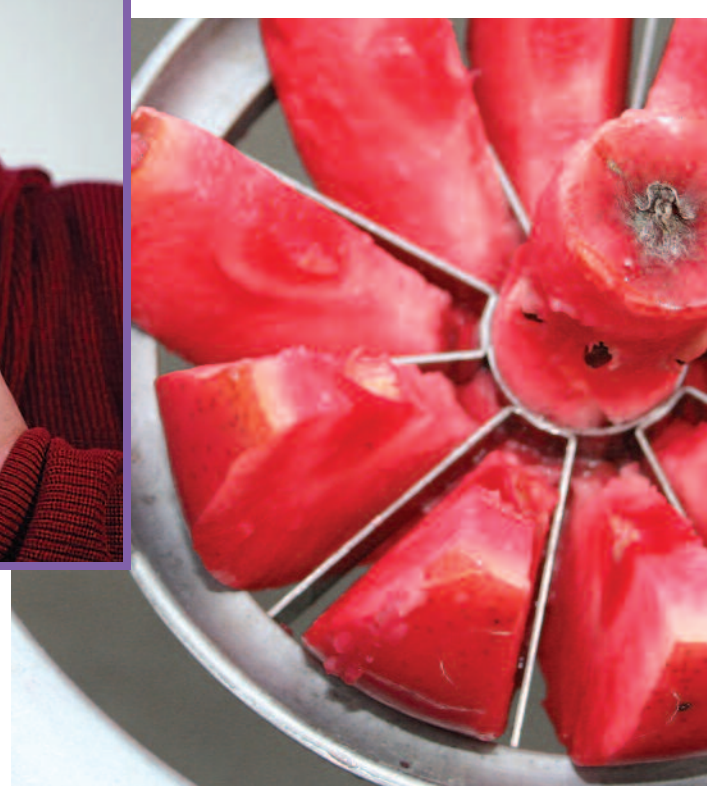
latest-maturing one has a sweet flavor, a sugar level of between 14 and 17° Brix, and a flavor profile that is different from any other apple in production, he said. They also vary in size. Most have been about the size of Gala in his unthinned test plots, but the late variety is larger.

Partnership

In order to supply the red varieties to the commercial fruit industry, Kobelt formed a new company called Fruture in partnership with Beat Lehner, a nursery that produces trees for commercial fruit



Most of the Redlove varieties are about the size of Gala, though a late-maturing one is larger.



For more information and videos of Redlove apples, check the Web site at www.lubera.co.uk.



Top: Trees with red-fleshed apples generally have bright pink blossoms. Center and top right: Markus Kolbert has developed six red-fleshed varieties with a range of ripening times that will all be marketed under the Redlove name.

all look similar from the outside, with full red skin, but the different ripening times will provide an extended marketing season. He doesn't think growers in a particular growing region will grow all six.

Goldland Fruit Group in China's Hebei Province has a license from NFG to propagate Redlove trees and develop production in China. It exhibited fruit at the 2009 Asia Fruit Logistica trade fair in Hong Kong.

Big news

When Suttons, a large nursery in the United Kingdom, signed up to supply Redlove trees to English gardeners, it was big news in the British media.

"Normally, if you introduce a new apple, you have no chance to come into *The Times* or the *Daily Mail*, but with this story, it's very easy," said Kolbert, who was also interviewed by the BBC

(British Broadcasting Company).

The first question the media asked was whether the apples were developed through genetic modification. He explained that they were developed through traditional breeding techniques, which he sees as a marketing advantage in Europe.

Each year, he plants about 10,000 to 20,000 seeds from crosses in pots in the greenhouse. When the seedlings have two or three leaves, he inoculates them with the scab organism to find which survive and are therefore resistant. He can get a good idea of which will produce red fruit just by looking at the leaves.

Generally, seedlings that have red leaves will produce red fruit, with a few exceptions. Red-fleshed apples usually have bright pink blossoms instead of white.

When the seedlings are about two meters (six feet) tall and have been screened for scab resistance and color, the tops are grafted onto Malling 9 or 27 rootstocks and planted out in the field for further evaluation.

First plantings

This fall, the first 60,000 to 100,000 Redlove trees will be planted in commercial orchards in Switzerland, Italy, France, and possibly England. Kolbert said growers are starting slowly because market demand is unknown.

"Nobody on the marketing side knows if there's a market niche for 2 percent of the market or 20 percent of the market," he said.

Fruit should be in the retail stores in about five years. Kolbert sees an opportunity to create excitement in the marketplace with this new and exotic product that might appeal even to people who are not normally apple eaters. Because anthocyanins are antioxidants, the apples could be promoted as being exceptionally good for the health, similar to other red fruits. The antioxidants also prevent the flesh from turning brown when sliced.

He thinks supermarkets will be eager to sell the apples because they like to have products that their competitors don't

have. However, they might also be a little afraid because this will be the first time they sell an apple that they need to promote to the consumers. "It's a new product that's really different," he said. ●

Because the red pigments are antioxidants, red-fleshed apples do not turn brown when sliced.

IN THE pipeline...

Other efforts to develop red-fleshed apple varieties are going on around the world.

In New Zealand, fruit breeders have been working to develop red varieties since 1998. Scientists at the Institute for Plant and Food Research Limited (formerly HortResearch) have pinpointed the gene that controls the anthocyanins, which are the red pigments, and have developed genetic markers to quickly identify seedlings with red fruit without needing to grow the trees.

Varieties developed in New Zealand will be commercialized through the international company Prevar. Lynnell Brandt, president of Brandt's Fruit Trees, Inc., Yakima, Washington, which is a shareholder in Prevar, said red-fleshed apples are a primary focus of the New Zealand breeding program, but scientists are still working to find selections with superior eating quality. He expects to have red selections to test in the next two years.

Germany

A red variety called Weirouge, a chance seedling found in Germany, is being grown commercially in Europe but is not suitable for fresh consumption, according to Dr. Walter Guerra at the Laimburg Research Center for Agriculture and Forestry in the South Tyrol region of Italy.

Guerra said the variety, which is fully red from the flowers to the leaves to the flesh, has been tested in the South Tyrol for several years but seems only to have potential for processing. It is astringent, mealy, susceptible to scald, and lacks good flavor.

Karl Luggin, a grower in the Vinschgau Valley in the South Tyrol, began planting the variety a few years ago and makes innovative processed products from it, such as juice, apple wine, and dried fruit (www.luggin.net/weirouge.html). —G. Warner



PHOTOS BY MARKUS KOBELT

"Nobody knows if there's a market niche for 2 percent of the market or 20 percent of the market."

—Markus Kolbert