Genetic wealth

Most food and feed crops grown around the world consist of just a few species: wheat, rice, corn, barley, potatoes, sweet potatoes, cassava, and soybeans. The variety in livestock is also modest: cattle, pigs, poultry, sheep, goats, and horses. In the timber industry, the species are spruce, fir, Douglas fir, and poplar. The variety of fishes in fish farming is limited to trout, salmon, bass, and carp.
The following table shows an overview of the plants most commonly used in European countries and their countries of origin:

Geographical region	Crops
Central America	Tomato, corn, cotton, cassava
South America/highlands	Potato, peanut
South America/lowlands	Tomato, tobacco, rubber, chili/bell pepper
Africa	Coffee, wheat, barley, millet
India	Mango, pea, eggplant, sugar cane
South Pacific islands	Coconut, sugar cane

Genetic poverty is thus already part of everyday life in large-scale farming. Since the 18th century, habitats originally rich in species have been converted very effectively to mass cultivation with few crops and livestock. In the course of the 20th century, three-fourths of the genetic variety in agriculture has been lost. Today, the world food supply depends on about 30 plant species.

Variety of potatoes from Peru.

Left photo: LoggaWiggler; right photo: skeeze (both public domain)

More than three-fourths of all crops originated from the tropics, including the three staples of humanity: wheat, rice, and corn. Even the predecessors of the domestic chicken originally roamed the tropical rainforests. Rice is a good yet tragic example of genetic impoverishment, also referred to as “genetic erosion”: Although approximately 5,000 rice varieties are known, three-fourths of the rice grown around the world originates from just one variety. In Indonesia, about 1,500 locally adapted rice varieties have gone extinct in the last 20 years. Monocultures, no matter the species, require extensive measures to protect them from pathogens and other pests. In Sri Lanka, 2,000 different varieties of rice were still grown in 1959; in 2002 there were just five.
However, the greater the genetic diversity, the lower the probability of cross-contamination and of the spreading of disease. Genetic diversity manifests itself as a wealth of species, but also in the low degree of relationship between the various individual species, which prevents inbreeding. With greater genetic diversity, epidemics such as avian flu or blue-ear pig disease have less of a chance to develop. Blue-ear disease periodically results in a collapse of the pork supply in China. Just how dangerous genetic poverty is became apparent in the 1970s: Global rice production experienced a crisis because a viral disease destroyed one-fourth of Asian rice production. Luckily, a variety of wide rice that was immune to the virus was found in the genetics database of the Interna-

tional Rice Research Institute. The resistant variety was found in only one location in a valley that was later flooded for a hydroelectric plant. Another example is soy production in the United States. The total soy production of the USA is based on only six individual plant species from a single location in Asia. Due to the danger of genetic poverty, genetic diversity – and tropical rainforests with their wealth of species – must be preserved!

Today, we know about some 75,000 plant species that are palatable and higher in quality than our crops: For example, the Goa or winged bean (Psophocarpus tetragonolobus) grows in New Guinea. The entire plant is edible, including the roots, seeds, leaves, stem, and blossoms. The sap can be used to make a coffee-like drink. It quickly grows up to four meters high and has the same nutritional value as soybeans.

Many wild plants contain substances that people can use. These substances range from fibrous material to oil. A good example of this is the babassu palm (Orbignya phalerata) from the Amazon rainforest: 500 trees of this palm species produce 20,000 liters of oil that is excellently suited for human nutrition.