



CROPS IN CRISIS: POTATO

ORIGIN OF THE POTATO

The potato, from the perennial *Solanum tuberosum* L., is the world's fourth largest food crop, following rice, wheat, and maize. The Incans in Peru were the first to cultivate potatoes, around 8,000 B.C. to 5,000 B.C.

In 1536 Spanish Conquistadors conquered Peru, discovered the flavors of the potato, and carried the tubers to Europe. Before the end of the sixteenth century, families of Basque sailors began to cultivate potatoes along the Biscay coast of northern Spain. Sir Walter Raleigh introduced potatoes to Ireland in 1589 on 40,000 acres of land near Cork. It took nearly four decades for the potato to spread to the rest of Europe.

Eventually, agriculturalists in Europe found potatoes easier to grow and cultivate than other staple crops, such as wheat and oats. Most importantly, it became known that potatoes contained most of the vitamins needed for sustenance, and they could feed nearly 10 people for each acre of land cultivated.

WHY IS THE POTATO A "CROP IN CRISIS"?

In what became known as the Irish Potato Famine (1845 and 1851), the Irish potato crop was largely destroyed by a fungal blight (*Phytophthora infestans*) recently imported from the New World. During that interval Ireland's population dropped by roughly 20% (12% starved, 8% emigrated) as food production failed and the economic system collapsed.



In hindsight, Ireland's mistake was to become dependant on a potato monoculture. In near-term costs and benefits, it was the rational course of action. However, no one anticipated the sudden appearance of a foreign plant pathogen which would wipe out the whole crop.

The more we limit the diversity of the staple crops we depend on, the more we set ourselves up for devastating crash cycles. A perhaps more sustainable approach would be to cultivate a much wider range of crops than we think we need.

Have we learned our lessons? Maybe not. Today, more than half the world's potato crop is made up of one variety of potato: the Russet Burbank favored by McDonald's.

NUTRITIONAL INFORMATION ABOUT THE POTATO

The potato is a versatile, carbohydrate-rich food highly popular worldwide and prepared and served in a variety of ways. Freshly harvested, it contains about 80 percent water and 20 percent dry matter. About 60 to 80 percent of the dry matter is starch. On a dry weight basis, the protein content of potato is similar to that of cereals and is very high in comparison to other roots and tubers. In addition, the potato is low in fat.

Potatoes are rich in several micronutrients, especially vitamin C – eaten with its skin, a single medium-sized potato of 150 grams provides nearly half the daily adult requirement of 100 mg. The potato is a moderate source of iron, and its high vitamin C content promotes iron absorption. It is a good source of vitamins B1, B3, and B6, and minerals such as potassium, phosphorus, and magnesium. Potatoes also contain folate, pantothenic acid, and riboflavin. They are a source of dietary antioxidants, which may play a part in preventing diseases related to aging, and dietary fiber, which benefits health.

POTATO AND “NUTRITION TRANSITION”

In many developing countries, and especially in urban areas, rising levels of income are driving a “nutrition transition” toward more energy-dense foods and prepared food products. As part of that transition, the demand for potatoes is increasing. In South Africa, potato consumption has been growing in urban areas, while in rural areas maize is still the staple. In China, higher

income and increased urbanization have led to increased demand for processed potatoes. Thus, the potato already plays a role in diet diversification in many countries. However, where other staple crops are available to meet energy requirements, the potato should not replace them, but rather supplement the diet with its vitamins and mineral content and high quality protein. Potatoes can be important staple foods, but balanced diets need to include other vegetables and whole grain foods.

FUN FACTS

- During the Alaska-Klondike Gold Rush (1896-1899), potatoes — valued for their scurvy-preventing vitamin C — were practically worth their weight in gold. And gold, at that time, was more plentiful than nutritious foods!
- In October 1995, the potato became the first vegetable to be grown in space. NASA and the University of Wisconsin, Madison, created the technology with the goal of feeding astronauts on long space voyages, and eventually feeding future space colonies.
- Today potatoes are grown in all 50 states of the USA and in about 125 countries throughout the world.
- The sweet potato belongs to the same family as morning glories, while the white potato belongs to the same group as tomatoes, tobacco, chili pepper, eggplant, and the petunia.
- The average American eats about 124 pounds of potatoes per year, while Germans eat about twice as much.
- In 1974, an Englishman named Eric Jenkins grew 370 pounds of potatoes from one plant.
- Thomas Jefferson gets the credit for introducing “french fries” to America when he served them at a White House dinner.

CROPS IN CRISIS: A ROLE FOR BIOTECHNOLOGY?

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