

TEN HEARTY ORPHAN CROPS¹

Brad Wittwer[©]

Ignored orphan crops may help back up world food supplies as diseases, such as wheat stem rust, devastate global monocultures in food crops.

Cassava: Cassava, also known as yucca or manioc, is a perennial native to South America. It is grown throughout tropical and subtropical regions, with Nigeria being the world's largest producer. The plant grows up to almost 3 meters tall and is a food staple for about 500 million people worldwide. The edible parts are the tuberous roots and leaves, which are a major source of carbohydrates. Cassava is the third largest source of carbohydrates in the world. The roots produce more food energy per unit of land than any other staple crop. It can be used in vegetable dishes, pancakes, flour or chips. Cassava thrives better in poor soils than any other major food plant – meaning fertilization is rarely necessary. The plant requires a minimum temperature of 25° C to grow, and being drought resistant, cassava can survive during the dry season despite low soil moisture and high humidity.

Chickpeas: The chickpea, also known as the garbanzo bean, is a legume rich in protein. The plant is grown ideally in tropical or subtropical climates but has a history throughout Europe, Turkey, the Middle East, India, parts of Africa and now in the United States. The plant grows to between 20 and 50 centimeters high. Much of the world's chickpea supply (80-90%) comes from India averaging about 800 kilograms per hectare there. The chickpea plant performs optimally around 21° C in drier conditions with 40-75 centimeters of rain annually.

Lentil: Of the legume family, lentil seeds come two in a pod from a plant that grows around 40 centimeters tall. Originating in the Near East, it has spread to the Mediterranean area, Asia, Europe and the Western Hemisphere. Lentil is a protein/calorie crop but is deficient in some amino acids. It is used in soups, stews, casseroles and salad dishes. It grows relatively well in dry areas and can thrive in cooler growing conditions; the young plants are tolerant of spring frosts, which permits early spring planting. Lentils have been grown extensively in the semi-arid parts of the world, where they have slightly lower yields, but good seed quality. Annual rainfall of 25-30 centimeters will produce high yields of good quality seed.

Millet: There exist many types of millet. All types are small-seeded grasses yielding cereal crops or grains grown in difficult production environments including those prone to drought. They have been grown in East Asia for the past 10,000 years. Millet is an annual grass that usually grows about 110 centimeters tall. Millet requires warm temperatures (between 20-25° C) for germination and development and is sensitive to frost. Millet is often grown as catch crops where other crops have failed or planting is delayed due to unfavorable weather. Millet is a major food source in arid and semi-arid regions of the world and can be used in flour, flat bread, porridge and also as bird and animal feed.

Pigeon pea: A three-to-five-year perennial of the legume family, the pigeon pea ranks fifth among edible legumes in worldwide production. It is tolerant of both low and high temperatures, growing 1 to 3 meters high. Seeds of pigeon pea are known to be a rich source of proteins, carbohydrates, important amino acids and minerals. People can both eat the dried

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peas or make flour out of them. Most likely originating in Asia, the pigeon pea has moved to East Africa and North America. Presently, pigeon peas are cultivated in tropical and semi-tropical regions. They are drought resistant and able to be grown with less than 650-millimeter annual rainfall. World production of pigeon peas is estimated at 46,000 square kilometers, 82% of which is grown in India. It is the most essential ingredient of animal feed in West Africa.

Plantains: Of the same family as bananas, the plantain is more often used in cooking than eaten raw. Plantains are a staple food in the tropical regions of the world and can be steamed, boiled, grilled, baked or fried as well as used in flour. The rootstock is edible, and sometimes the young shoots are cooked and eaten. Plantains can be used for cooking at any stage of ripeness, made into chips, and very ripe plantains can be eaten raw. Bananas and plantains are currently grown in humid tropical regions and are the fourth largest fruit crop in the world. They require a mean temperature of 25° C and about 10 centimeters of rain per month.

Quinoa: Quinoa, a grain-like crop, is primarily grown for its seeds, though its leaves can also be eaten. Quinoa is a pseudo-cereal and closely related to species such as beets and spinach. Originally harvested in the Andean region of South America, Quinoa can tolerate altitude but also requires a relatively long growing season. Its protein content is very high and unlike wheat or rice, quinoa contains a balanced set of essential amino acids. It is a good source of dietary fiber and is high in iron. Quinoa is gluten free and considered easy to digest.

Sorghum: Sorghum, an annual grass, is exceptionally drought-tolerant making it an appropriate choice for arid, dry regions where it is typically a staple food. There exist many types of sorghum. Some species are cultivated for grain and some for fodder; for both food and pasture, it is a vital crop in Africa, Central America and South Asia. The plants are native to tropical and subtropical regions all over the world and considered to be the fifth most important cereal crop worldwide. In addition to grain, Sorghum can be used for syrup, porridge, bread, cookies, cakes, couscous, malted beverages and molasses. Sweet sorghum stalks can also be used for producing ethanol biofuel. The United States is the world's largest producer of grain sorghum, but as a continent, Africa is the largest. In traditional form, sorghum is more than 2 meters tall, although many grown species are dwarf breeds designed for easy harvest. The plant is rich in fiber, protein, iron and antioxidants and is gluten-free.

Taro (cocoyam): A tropical perennial, taro is harvested usually as a root vegetable for its edible corm (a swollen underground plant stem) but also as a leaf vegetable. It is a staple food in oceanic cultures, though the plant is inedible when raw. Taro corms must be roasted, boiled or baked and may be made into cakes. They are very high in starch and are a good source of dietary fiber. Taro leaves, 1 to 2 meters long, are rich in vitamins and minerals, and are good sources of iron, zinc, vitamin B6, vitamin C and potassium. Some varieties of taro can also be grown away from the tropics. Roughly 10 percent of the world's population uses taro or taro-like plants as a staple food source; for 100 million people, it is an important daily food. Taro is a common crop for moist soils in humid regions such as Southeast Asia. The plants have lost the ability to reproduce in the wild, so crops must be entirely replanted by hand.

Yams: Not the sweet potatoes of the U.S., these perennial vines are grown for their starchy tubers in Africa, Asia, Latin America and Oceania. A warm climate crop, major production is centered in West Africa. They can be barbecued, roasted, fried, grilled, boiled or smoked. Yam tubers, up to 2.5 meters in length and up to 70 kilograms in weight, can be stored up to six months without refrigeration. Yams are high in vitamin C, dietary fiber, vitamin B6 and potassium while being low in saturated fat and sodium.