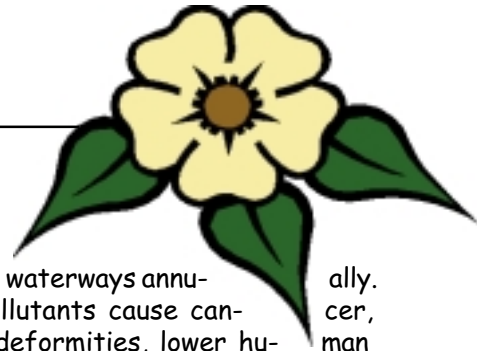


Kenaf



Kenaf, originally from Africa, is a close relative to cotton and okra. Kenaf (*Hibiscus cannabinus*), which can grow well in many parts of America, is growing in popularity. A high yielding and easily grown crop, it has the potential for a variety of uses—from rope and twine to animal litter and bedding, rugs to livestock feed, bags to paper. It is currently the major alternative used in U.S. paper production but is still far from replacing wood and protecting what remains of the world's forests.

Benefits

Deforestation is occurring at an alarming rate, and America is the leader in wood product demand. We represent 5 percent of the world's population, yet we consume approximately 20 percent of the world's logged wood. Each year, Americans on average use approximately 800 pounds of paper product per person, and more than 40 percent of U.S. municipal solid waste is comprised of paper. Approximately 95 percent of America's virgin forests have been cut, leaving only 5 percent in its original state. The fight to save not only our forests but the world's forests is failing. One response to this travesty is to find alternatives to trees for the production of paper and other products. Kenaf is a promising alternative.

Kenaf yields six to ten tons of dry fiber per acre per year.

It grows quickly rising to heights of 12-14 feet in as little as four to five months. It yields six to ten tons of dry fiber per acre per year whereas southern pine, the fastest growing logged tree, produces three to five times less and can take 7-40 years to reach harvestable size in a natural forest. Kenaf saves up to 30 percent more energy in the mechanical pulp and refining process and requires less water and chemicals than wood pulping.

U.S. paper mills use three million tons of chlorine each year and in turn release 400-700 million pounds of dioxins and other toxic substances, called organochlorides,

into U.S. waterways annually. These pollutants cause cancer, produce deformities, lower human and non-human endocrine systems, endanger breast fed children, and cause reproductive harm in vertebrate and non-vertebrate species. Kenaf reduces toxins used in pulping, because it has 68 percent less lignin—the substance which holds the fibers together. This means that it takes far fewer chemicals to produce pulp and in turn is also easier and far less polluting to bleach.

A History of Paper

Paper came into use six thousand years ago in Ancient Egypt when papyrus was woven together and then pounded into hard thin sheets. The word "paper" comes from this early paper plant, "papyrus." Four thousand years later, in 105 AD Ts'aiLun, a Chinese inventor, mixed mulberry bark, hemp and rags with water, mashed it into pulp, pressed out the liquid and hung the thin mat to dry, creating the process of paper making that is the model for paper production today. The process turned into an art form and slowly spread from China around the world. However, each country and period differed in how they made their paper.

In the 3rd century AD, China used flax and wisteria. Five hundred years later Japan began using hemp, and 400 years after that Spain began using cotton. When the "New World" was discovered trees appeared to be an endless commodity and for the next hundred years inventors struggled to produce paper using only wood. Finally, in 1852 AD, Hugh Burgess, an Englishman, perfected the use of wood pulp by digesting the wood with chemicals. Today, we use a similar chemical process to soften the raw pulp and chlorine to bleach it.

The United States Department of Agriculture chose kenaf over 500 other crops as the best choice for a new industrially grown fiber.

History of Kenaf in America

Kenaf was introduced into America during World War II as a result of the disruption of jute and abaca trade from Asia. In the 1950s, the USDA and Agricultural Research Service (ARS) screened more than 500 plant species for their paper manufacturing potential and in 1960 kenaf was selected as the most promising.

From 1960 to 1978 the ARS conducted studies of kenaf as a raw material for pulp and paper manufacture. The ARS tested and manufactured not only a wide variety of kenaf paper but also other potential products. Testing ended in 1978 when the ARS decided that it had sufficiently proven kenaf to be a renewable fiber and focused its research program on hydrocarbons due to the energy crisis (scientists working on the project believed that one or two more years of research could bring about commercialization of kenaf).

From 1979 to 1985 the American Newspaper Publishers Association and International Paper continued research on kenaf for newsprint. They did two runs, growing the plant pulping the fiber and manufacturing the paper. At the end of the second run in 1981, the researchers formed Kenaf International (KI). KI testing showed Kenaf has superior brightness and strength, requires less ink, is more resistant to ruboff, and has high opacity.

The Joint Kenaf Task Force comprised of the USDA, KI, C-E Sprout Bauer for equipment in manufacturing and pulping, and CIP Inc., for paper mill management, kenaf research, and processing experience worked together to produce The Bakersfield Californian on kenaf newsprint. This breakthrough demonstrated an efficient and economical way to produce kenaf paper and paved the way for a kenaf paper company, Vision Paper. In 1992, Vision Paper began production of the first kenaf tree-free chlorine free papers and is still the leader in kenaf paper production today.

Kenaf Today

Combined with other environmental strategies, kenaf can be a viable replacement for wood fibers and not just for papers. Unlike most other harvestable fibers, it is highly

Complementary Strategies: Reduce Paper Use, Recycle, Use Substitutes

Although increased kenaf production would reduce demand for logging and lower chemical output by paper factories, it is only part of the solution. There are many other actions that should be taken to reduce wood demand; the first is to reduce the amount of paper used and to increase the amount of paper recycled. Breakthroughs are possible. The Bank of America not only increased recycled paper used, from 18 percent to 81 percent, but also reduced the paper it uses by 30 percent. If every company and individual was more conscious of recycling and opportunities to reduce excess paper use, we could reduce logging for paper by over 50 percent.

An important measure that compliments using crops such as kenaf as a wood substitute would be to start producing paper out of the wasted straw that is burned seasonally. The rice and wheat straw wasted and burned each year after the harvest produces more carbon monoxide in California than all the other electric power generators in the state combined. This amount of wasted straw is enough to fulfill America's paper needs at a competitive price.

versatile and has been used for a variety of products. Some of kenaf's more visible uses have included wine labels in California, application and marketing pamphlets for the University of Virginia and McDonald food wrappers for the 1998 Winter Olympics in Japan. It is also used with industrial hemp, another crop, for car door panels. Kenaf products may see increased demand in the future, as the federal government, America's largest consumer, works to stimulate the market for biobased products. (The federal government attempts to be a responsible consumer, by purchasing environmentally preferable products.)

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