

History of Hemp Fibre

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History of Hemp Fibre

Intro

Hemp (*Cannabis sativa* L) is a plant that have a wide range of useful products that they made including rope, clothing and sails. In fact, "cantrrabis sativa" means "useful" (*sativa*) "hemp" (*cannabis*). With a relatively short growth cycle of 120 days and the planted densely at arate of 3 to 5 hundred plants per square metre. It is very tall, ranging in height to 6 to 16 feet with majority of each plant comprised of thin stalks with no branches and relatively few leaves. Use of hemp dates back many thousands of years and unlike many other crops, hemp can be grown in most locations and climates. Where hemp is grown, it has become a valuable and environmentally friendly crop.

General History

For most of its history, hemp was most valued as a fiber source, and only to a limited extent as an oilseed crop. Hemp was harvested by the Chinese 8500 years ago and is one of the oldest sources of textile fiber, with extant remains of hempen cloth trailing back 6 millennia. Hemp, thru the trade route, grown for fiber was introduced to western Asia, Japan and Egypt, and subsequently to Europe somewhere between 1000 and 2000 B.C.

Hemp in Japanese History

In the Period of the Yayoi, major changes in Japan as "foreigners" imported more advanced practices and quickly made the indigenous Japanese adapt their ways. Most significant was the spread of agriculture and clan-like social arrangement. At that time, the people lived in groups and wore hemp clothes and bark, a technique lasted for hundreds of years.

To better determine the journey that those first hemp seeds took, one can consider the examples of three other prominent imports which shaped Japanese culture and indeed became standards of Japanese civilization: Buddhism, wet-field rice and Washi paper. The history of paper is easily traced because it was written down on paper. The first real paper in known to have been created in China from hemp rags by a court eunuch, Ts'ai Lun, from a mix of old hemp rags and mulberry bark in around 100 A.D.

Furthermore, there were numerous ships traveling between China, Korea and Japan exchanging new ideas and information even before this period.

It is probable that hemp made the same voyage before or around the same time. There are reports of seeds from prehistoric periods that have been uncovered on the island of Kyushu which would suggest this passage definitely took place before the Common Era; yet scientific dating techniques would have a hard time putting an accurate date on such a small artifact.

By that time, hemp had successfully adapted to the Japanese climate and spread throughout the latitudes. Even on the northern island of Hokkaido, the indigenous Ainu made their colourful costumes from the fibre during the Yayoi period around the 3rd century AD.

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Thus, hemp was already a well-established crop in many parts of Japan by the time written language was commonly used, and the first "Official" recorded history appears as the Nihon Shoki (Chronicle of Japan), published by Crown Prince Shotoku in 710 AD. Made from hemp and mulberry bark, as in the Chinese tradition, the paper that the Korean monk, Doncho, produced for his royal demonstration. The Japanese copied his technique; the skill spread rapidly throughout Japan, with over 80 subtle varieties of paper being made throughout Japan within 50 years.

Evidence of that vital period of Japanese history is owned by a Nihonga painter named Haneshi. He possesses a piece of brown and slightly brittle, pure hemp paper, dated at 770 AD,

Cotton, hemp and rice were cultivated there during Hideyoshi's day by a comparatively well-off community of peasants, many of whom owned their own land."

During the feudal era, hemp cultivation was encouraged by the Daimyo (feudal lords) wanting hempen-ware's high resale value from the wealthy city merchants who favoured hemp for making fine clothing.

During this time, Japanese agriculture and social structure continued to change despite lack of new influence from outside sources. Indeed as the merchants and daimyo feuded, the farmers started to "unionize" to sell their hemp directly to the markets in Edo (old Tokyo).

Toward the end of the 16th century, however cotton found its natural habitat in the Kinai, thereafter the production of raw cotton very rapidly increased... The hemp cloth industry of Uonuma county in Echigo Province provides an example of a different kind. This industry dated back to at least the Nara period, when taxes were partly paid by the cloth. But the industry here achieved no considerable growth until certain innovations in bleaching and weaving were made toward the end of the seventeenth century. After that the output of hemp cloth increased from about five thousand rolls to about two hundred thousand roll annually until the end of the eighteenth century.

Hemp in Europe History

Cultivation in Europe became widespread after 500 B.C. and some of the produces from hemp includes rope, sail cloth, sacking work clothes as fabric from circa 400 B.C. and hemp continued to be cultivated in Central Europe through the centuries.

By the 5th Century, Hemp was a well-established crop and cultivation spreads throughout Europe. Some of the area includes Germanics, Franks, Anglo-Saxon, and Norse and make paper, sails, fishing nets, lines, caulking and rope. In Fact, a bridge, made from hemp reinforced, was built in France in the 6th Century and the bridge actually petrified and is still strong today.

The rope spinner, which was a weighted wooden dowel and paddle and tied strand, was spun around and the spinning imparted a twist to the strand. Then, Snag the strand with the hook and pass it around to make 2 or 3 of strands and tied it back to the wooden paddle. The twisted

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strands would then be twisted together in the opposite direction. A static method does work well, although it will not make long rope.

Some other uses for Hemp includes in the early 8th Century Shoes are constructed, Knights drank hemp beer and in the early 11th Century hemp butter was introduced in Europe. Also, The English word "Hemp" was listed in a dictionary.

The first paper mill in 1150 A.D. in Moorish Spain used hemp. After pulping the fine fibres produce an excellent strong lightweight paper. By the end of the 15th century Hemp paper-making started in England. By 16th century, the art of paper-making was firmly established in Europe. Hemp paper lasted until the end of the 19th Century.

In the 13th century from British Isles to Italy, rope was made using a "rope walk" method. This allowed for long ropes of up to 300 yards long or longer to be made. The development of the "rope walk" was made because of tall ships which require ropes to be long, relatively uniform in diameter, and strong.

The ropemakers were accustomed to making all of these in a walk. The principal of the walk is that yarns are stretched out between revolving hooks, often 300 yards apart, and these hooks twist the yarns together.

Renaissance artists, 14th - 16th Century committed their masterpieces to hemp canvas. In 1456, Gutenberg Bible printed on hemp paper and in 1492, Hemp sails and ropes made Columbus's trip to America possible.

In 1537, Hemp receives the name Cannabis Sativa, the scientific name that stands today.

In the 1535, Henry VIII passes an act stating that all landowners must sow 1/4 acre of hemp, or be fined and in 1563, Queen Elizabeth I decrees that land owners with 60 acres or more must grow hemp or else face a fine. Hemp has wide cultivation in Europe for its fibre and its seed, which was cooked with barley and other grains and eaten. In the end of the 16th Century, Galileo's scientific observation notes written on hemp paper.

Information and used on Hemp

More than fifty plants of other genera are referred to as "Hemp", including Manila hemp (*Musa textilis*) and sunn hemp (*Crotalaria juncea*). While these various plants have some useful fiber qualities for twine or matting, they do not yield high-quality textiles, nor do they have the antimicrobial or rot-resistant properties of industrial hemp. Historically, most of these other fibers were not used for sail or more marine cordage, because they would mildew and eventually rot when exposed to salt.

Unlike many crops, hemp can be grown in most locations and climates with only moderate water and fertilizer requirements. Where hemp is grown, it has become a valuable and environmentally friendly crop.

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The fibre (bast fibre) is found in the outer bark of the stem. Straw yields can on average be between 5 - 10 tons per hectare but only a proportion of this is made up of the useful bast fibres.

Grow and Harvest Hemp

A fast growing plant, with little or no need for herbicides or insecticides, with a relatively short growth cycle of 120 days, hemp can reach its full height of 6 to 16 feet in as few as 90 days. Hemp cultivated for the production of fibre, cut before the seeds are formed, and retted on the land where it has been grown, tends to improve rather than injure the soil. It improves its physical condition, destroys weeds and does not exhaust its fertility. Among fiber crops, hemp is the least chemically dependent, as shown in the accompanying chart. It ranks selected fiber crops with regard to their resistance against pests and weeds

Relative Pest and Weed - Resistance of Fiber Crops

Crop	Disease and	
	Insect Problems	Weed Problems
Hemp	1	1
Flax	4	4
Kenaf	3	3
Cotton	5	5

Relative 0 - (better) - 5 - (worse) @ 1997 Hemptech

Seed Selection

Risky to take seeds adapted to a certain geographic area and plant them in a different region, because they have not had the opportunity to adjust the local variation in climate, soil chemistry and so on.

The grower should therefore consider raising the crop for seed and taking the stalks as a byproduct. On the other hand if the planting seed originates at a latitude toward the equator, the crop will flower later, so it should be grown for fiber and cut as the male begin to shed pollen.

Once the seed has been selected, the next step is to increase the seed supply for the needed acreage. A hemp-seed planted at a rate of 10 pound to an acre, on approximately 20 inch spacing should yield 700 to 1,000 pounds of seed per acre. Uncultivated hemp of ancient China had an average fiber content of around 72 to 15 percent.

Hemp is a relatively easy crop to grow and farmers need follow only a few established guidelines to be rewarded with high yields. Additionally, hemp farmers receive the benefit of improved soil condition for the next crop planted.

Crop Rotation

Like Corn, Hemp is an annual plant, and must be seeded every year. Traditionally, hemp has been grown in rotation with corn, a small grain such as wheat, and a multiseason legume such as

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alfalfa or clover. English farmers are reporting 10 percent increases in yield when winter wheat is planted following hemp.

Soil Selection

The soil selection should be anywhere land that grows good corn will produce good hemp, which thrives in well-drained soil with tilth (texture) and ample organic matter. Hemp generally does not do well in light soils, marginal soils low in organic matter, or soils that are poorly drained.

Moisture Requirement

Hemp is not a drought tolerant crop. Areas where it has typically done well receive annual precipitation of about 30 inches. Water is most important to the crop during the first 30 to 45 days, when the plants can grow 12 inches in a week. But hemp does not like to stand in water.

Very few farm crop require so much water as hemp, yet it will not endure standing water about its roots. In soils of good capillarity, where the general level of soil water is within 10 feet of the surface, there is little danger of injury from drought after the first 30 days, during which the root system of the hemp plant will become well established.

Temperature Requirement

Hemp does relatively well in the face of temperature extremes. When a hemp seed germinates, it gives off heat, metabolizing its stored oil.

It is generally advised that growers plant hemp one to two weeks before it is time to plant corn. Hemp will withstand light frosts, and it grow at colder temperatures.

Seedbed Preparation

Good Seedbed is important because this supports the uniform growth of the stalks. Uniformity is a key factor for good fiber: Overly large stalks will yield a coarse, low- grade fiber, whereas stalks one-quarter inch in diameter will produce a high-grade fiber.

Thorough harrowing of the seedbed - to break up large clods and smooth the soil surface - is recommend in order to facilitate uniform stalk development.

In the old days, hemp was sown by broadcasting, that is, throwing the seeds onto the soil. This tactic produced an uneven stand, since the seeds were spaced randomly.

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"... before the red of apple buds become a sign in the low orchards, or the high song of the thrush is pouring forth far away at wet pale-green sunsets, the sower, the earliest sower of the hemp, goes forth into the fields."

*from The Reign of Law: A Tale of the Kentucky Hemp Fields,
James Allen, 1900.*

Fertilizer

Hemp is appealing in that it lends itself to organic farming methods, but if and when the crop achieves the planting acreage required to supply paper or fiberboard factories, it seems unlikely that most growers will be organically inclined. Commercial chemical fertilizers can be applied on hemp as on corn; hems requirement of nitrogen, phosphorus, and potassium is similar to that of com when the two plant are grown under similar conditions.

Experienced hemp farmers know that pouring nitrogen on a crop will not result in everhigher yield or quality. It is better to err on the light side tan the heavy side with inorganic nitrogen. Over-fertilizationis associated with excessive growth, weaker fiber, increased self-thinning, and less uniform stalks Seeding.

Generally speaking, soil temperature should reach 8 to 10 degree Celsius (45 degrees Fahrenheit) before hemp is sown.

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Robert C. Clarke/IFA

Seeding rates for hemp vary widely. In the Ferrara region of Italy, hemp traditionally was sown at a rate of hundreds of pounds of seed per acre. This approach produced a flax-like hemp famed for its fine quality. The U.S. the rate recommended by the Wisconsin hemp industry during WWII was a bushel and a peck (55 pounds) per acre. However, rates as low as 35 pounds of seed per acre reportedly have given yields approximating those produced by higher rates.

Imported hemp seed is expensive, so the lower sowing rate is recommended if the goal is an industrial fiber crop. Finer, textile-quality hemp requires higher seeding density.

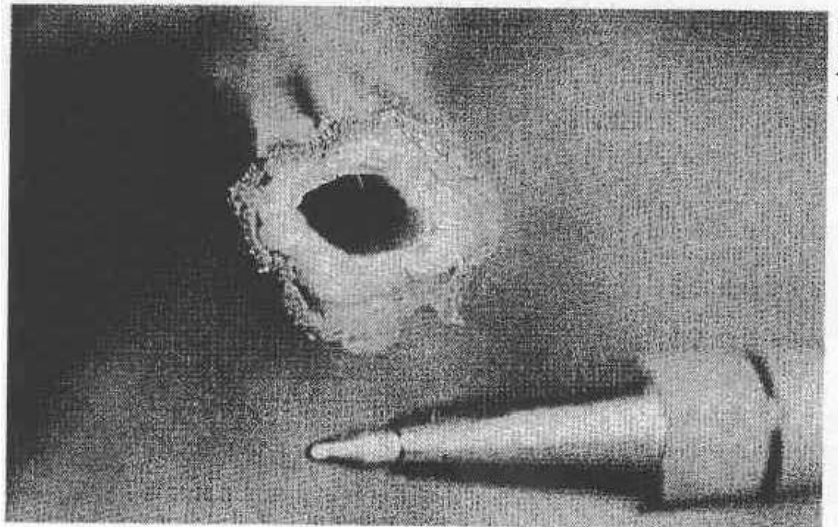
The best results have been obtained by planting hemp with a grain drill or precision seeder with four-inch row spacing. Farmers should test seed germination and adjust the planting rate accordingly.

Valuable hemp seeds ready for planting.



Robert C. Clarke/IFA

Hemp's deep taproot aerates soil and adds valuable organic matter.



Geoff G. Kime

Cross-section of a thin hemp stalk.

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Weed Control

An appealing characteristic of the hemp crop is its ability to discourage the presence of weeds, due to the shade created by its dense growth.

However, hemp's ability to suppress weeds does not mean that it can be planted without proper preparation of the land. Weedy land should be thoroughly plowed and disced to destroy weeds prior to planting. Given a head start, hemp will progressively reduce weed pressure for following crops. To bring persistent weeds under control, one should initially plant hemp for two years in succession on the same land. After that, normal rotation of crops will keep weeds down.

Diseases and Infestations

In June and December 1996, the Journal of the International Hemp Association published a two part review of Cannabis diseases and pests by John McPartland, who writes: Cannabis has a reputation for being pest-free. Actually, it is pest-tolerant...Most Cannabis pests are insects. Nearly three hundred insect pests have been described on hemp and marijuana but very few cause economic crop losses. In hemp crops, the most serious pests are lepidopterous stem borers, predominately European corn borer (*Ostrinia nubilalis*) and hemp borers (*Grapholita delineana*). Beetles, grubs also bore into stems and roots (e.g. *Psylliodes attenuata*, *Ceutorhynchus rapae*, *Rhinoceros pericarpus*, *Thyestes gebleri*, and several *Mordellistena* species).

The claim that cannabis has no disease is not correct. Cannabis suffers over one hundred diseases, but less than a dozen are serious.

Common Cannabis Pests

Seed and Seedlings	Flower and Leaf, Outdoors	Flower and Leaf, Indoor	Stalk and Stern	Root
cutworms	hemp flea beetles	spider mites	European corn	hemp flea beetles
birds	hemp borers	aphids	borers	white root grubs
hemp flea beetles	budworms	whiteflies	hemp borers	root maggots
crickets	leaf miners	thrips	weevils	termites and ants
slugs	green stink bugs	leafhoppers	modellid grubs	fungus gnats
rodents			longhorn grubs	wireworms

Source: Journal of the International Hemp Association 3, no. 2 (1996)

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Common Cannabis Diseases

Seedling-diseases	Flower and Leaf diseases, Outdoors	Flower and Leaf diseases. Indoor	Stalk and Stern diseases	Root diseases
Damping-off	Gray mold	Nutritional	Gray mold	Fusarium root rot
fungi	Yellow & brown	diseases	Hemp canker	Root knot nema
Storage fungi	leaf spots	Pink rot	Fusarium canker	Broomrape
Genetic sterility	Downy mildew	Gray mold	Fusarium wilt	Rhizoc root rot
	Olive leaf spot	Powdery mildew	Stem nema	Sclerotium rot
	Nutritional	Brown blight	Charcoal rot	Cyst nema
	diseases	Virus diseases	Aathracnose	
	Brown blight		Striatura ulcerosa	
	Bacterial leaf		dodder	
	diseases			

Source: Journal of the International Hemp Association 3, no. 1 (1996)

Harvesting and Retting

Retting is the traditional process of letting the hemp stalk partially rot in order to separate the bast fiber from the core. It is a critical step in the handling of the hemp crop. Retting has been done in many ways: in streams and ponds, in tanks and artificial pools, on land and in snow. For textile-grade fiber, the process has historically involved water retting, which has environmental disadvantages. Water retting in tanks tends to be anaerobic, and creates an offensive odor. The water must be disposed of in an environmentally sensitive manner, for it can be a nasty pollutant.

The preferred method was field dew retting, in which the cut stalks are left out in the field for several weeks while natural humidity and bacteria decompose the fiber-binding pectins. This method is dependent on adequate fall moisture; an entire year's crop was lost in Wisconsin in the 1950s due to poor weather conditions. On the other hand, field retting does return nutrients to the soil as the hemp decomposes.

Regardless of retting technique, the process must be monitored carefully so that it progresses far enough without going too far. When the adequately retted stalk is flexed rapidly, its core should readily separate from the long fibers.



Gathering retted hemp stalks to be placed in vertical hemp shocks.

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Bibliography

Hemp Horizons - The comeback of the World's Most Promising Plant, John W. Roulac and Hemptech, Chelsea Green Publishing Company, White River Junction, Vermont, Copyright © 1997 John W. Roulac and Hemptech. All rights reserved
ISBN 0-930032-93-8

Hemp: A New Crop with New Uses for North America*, Ernest Small and David Marcus,
<<http://www.hort.purdue.edu/newcrop/ncnu02/v5-284.html>>

Dictionary of Textile Materials and Technologies,
<<http://home.gci.net/~vfa-guild/source/term001.htm>>

HempNation, <<http://www.hempnation.com/>>

Henfaes Research Centre, University of Wales, Bangor, Flax and Hemp Project, © 2004-2005
Henfaes Research Centre, UWB, Abergwyngregyn, Llanfairfechan, Gwynedd LL33
0LB. Wales, Tel: 01248 689 079.
<http://www.flaxandhemp.bangor.ac.uk/english/fibre_culti_growing.htm>

Dictionary of Textile Materials and Technologies

THE HISTORY OF ROPEMAKING, by John Roper (aka John Nelson)

The Rope Spinner, by Deni Massey

A Brief History of Hemp, <<http://www.fattyboombatty.comftremp.htm>>

Ropemaking,
<<http://www.ims.plymouth.ac.uk/nautarch/ropemaking.htm#Ropemaking>>

Plymouth Ropewalks,
<http://www.ims.plymouth.ac.uk/nautarch/spinning_a_yarn.htm#Ropemaking>

List of Plymouth Ropewalks,
<<http://www.ims.plymouth.ac.uk/nautarch/plymouth%20list.htm#Summary%20list>>