plant fibres & textiles

what are they?

There are 3 main types of plant fibres: bast (mainly from stems – e.g. flax and hemp), leaf (e.g. pineapple and sisal) and seed (e.g. cotton and kapok); but also wood (from trees, naturally), grass (e.g. bamboo) and fruit (e.g. coconut). The fibres are elongated, supportive strands composed of individual cellulose cells that are held together with gums and pectins. Plant fibres have a long history of use in textiles, cordage and paper, and more recently in technical applications – e.g. composite materials.

Fibre-yielding plants are found wherever vegetation exists around the globe. Indigenous communities have used these plants for both cordage and textiles. Archaeological studies have identified the use of cellulosic fibres from at least the Neolithic period, and some long traditions of processing and using plant fibres continue to this day. On a larger scale, the commercialisation of plant fibres such as sisal, jute and coir have made them important to some countries' economies.

Most people are familiar with flax and hemp, which have lent themselves to wide cultivation in many parts of the world. However, there are also useful fibres to be found in UK wild plants, including nettle, hops, mallow and honeysuckle (which was used to make ropes to help construct the Bronze Age Seahenge – see wikipedia.org/wiki/Seahenge). The use of the Common Nettle (*Urtica dioica*) is better known, and regularly resurges as a source of fibre for textiles, particularly during times of crisis, and more recently as a sustainable replacement for problematic cotton and synthetic fibres.

Trials are being carried out to test the feasibility of banana, pineapple and coconut fibre, amongst others. There's already been a high level of success with bamboo fibre and wood pulp (Tencel). If these materials are to be produced on a commercial scale, then the issues of plant cultivation, processing, resource use, potential contamination and transportation need to be taken into consideration. However, major companies and organisations are now taking on board the need to develop more sustainable textile fibres.

The nettle has long been cultivated for fibre production and other end products. In order to maximise output, several high-fibre varieties were bred in Germany between the World Wars, and in recent years these have been resurrected as a potential source of commercial nettle fibre.

There's growing interest in creating cloth from plant fibres on an artisanal scale, using whatever fibre plants are locally available.

what are the benefits?

Our perception of 'cloth' has changed a lot over time. We currently have a textile industry that's laden with problems. Cheap, synthetic clothes are mass-produced in countries where people (including children), desperate to make a living, are forced to work in dangerous and unhealthy conditions to produce clothing for a fickle and ever-changing market. Clothes are quickly discarded, wasting resources and creating a huge disposal problem. In the past, cloth was highly valued and precious. Until the 19th century, all clothing was made from natural fibres, including hemp and flax, either at home, or by a tailor or seamstress if that could be afforded. People had a limited wardrobe (sometimes only one set of clothes!), which was looked after, mended and even handed on after their death. Finally, until the invention of synthetic fibres, all cloth that completed its lifecycle could be composted or burnt. We need to renew our perception of cloth. We need to learn to value it again. When it's no longer serviceable, we need to be able to return it to the soil.

Plant fibres, plus animal fibres such as wool and silk, are biodegradable, and the cloth produced from them is generally of high quality. We're all familiar with cotton, which is strong, flexible, comfortable and absorbent and at the moment is the most common plant fibre used around the world. But cotton has a tragic history, linked to the slave trade, and in the UK to the horrific working conditions in the 19th century cotton mills. Today the production of cotton requires the use of dangerous pesticides and vast quantities of water for irrigation. Even the production of organic cotton requires huge amounts of water.

Wild fibre plants, like nettles, grow easily, provide food for butterflies, and don't need pesticides, chemical fertilisers or irrigation.

Flax Brake – traditional method of separating the fibres from the stem by hand.

what can I do?

In the UK, flax and hemp are easily cultivated and so raw material is generally available for spinning and weaving. People are also experimenting with other plants such as Stinging Nettle (*Urtica dioica*) that can be collected from the wild.

The traditional method of processing plant fibre depended on which species is available, the local climate, available tools, and resources such as water supply. There are examples around the world of communities that have thrived as a result of an enduring culture based on the use of local plant fibres. For example, for many years the Dunsmore Trust has supported women from East Nepal in processing the fibre of the Nepalese Nettle (*Girardinia diversifolia*) and enabling them to sell their products to a wider market. In Ecuador, efforts are being made to preserve an ancient local seed cotton fibre tradition.

You can try fibre extraction and preparation yourself, and to create some form of textile from it. A small plot of flax could easily be grown in a garden, and nettles are freely available in the wild – but first consider where you're collecting nettles from, and what else might be dependent on them. Nettles are an essential part of the ecosystem and several butterflies are completely dependent on them as a food source for their larvae. Also, wear gloves and use secateurs or scissors as nettles have an unpleasant (though not dangerous) sting.

Scarf made from 100% wild stinging nettle (Urtica dioica).

Dew retting flax and nettle stems.

There's a variety of extraction methods including:

- Decortication: separating the fibre from the stem, usually with a decorticating machine.
- Scraping: the removal of plant material from the fibres, normally done by hand.
- Retting: separating fibres from stems via the breakdown of plant matter by microorganisms and moisture. The two main and traditional methods are dew retting and water retting.
- Overwintering: winter weather breaks down plant matter in situ to reveal the fibres.
- Chemical extraction: the removal of plant fibres with chemicals such as Sodium hydroxide.
- Enzyme extraction: removal of plant fibres with enzymes such as pectinases and xylanases.

A combination of methods can be used. There are plenty of online guides to help you, including videos on the Nettles for Textiles website, which can also be used for other plants. No specialist equipment is required; and if you have access to a garden, pond or river, then you might be able to experiment with retting.

resources

- see lowimpact.org/plant-fibres for more info, products, courses and books, including:
- Gillian Edom, *From Sting to Spin*
- R Burgess & C White, *Fibershed*
- Patricia Baines, *Flax & Linen*
- Birte Ford, *Yarn from Wild Nettles*
- nettlesfortextiles.org.uk – repository of all things nettle-related, esp. local textile production
- wildfibres.co.uk – info on wild plant fibres
- britishhempalliance.co.uk – promoting the domestic hemp industry