

## INTRODUCTION

The name hemp most usually refers to the plant with the botanical name *Cannabis sativa*. However, a wide range of other plants are also known as hemp (e.g. sisal hemp and the native hemp nettle and hemp agrimony). This leaflet relates to *Cannabis sativa*.

Hemp grown for fibre production is frequently referred to as "industrial" hemp, in order to differentiate it from the plants used for drug production. Industrial hemp has been selectively bred for several decades in order to lower, to almost negligible amounts, the narcotic compound delta-9 tetrahydrocannabinol (THC).

Varieties of non-psychoactive hemp are also grown for seed production. The seeds have mainly been used for bird feed, but increasingly are used to produce hemp oil and as a cooking ingredient.

**\*\*\*All hemp grown in the UK has to be grown under licence from the Home Office.\*\*\***

## TERMINOLOGY

The words used in association with hemp production can be quite confusing. Here we explain a few of the most common terms:

- **Bast** – long fibres
- **Decortication** – removal of the tough outer layer of the stem
- **Hackling** – combing out the long fibres
- **Hurd** – inner fibrous material
- **Retting** – fungal activity that begins the breakdown of tough bonds within the stems (essentially rotting!)
- **Scutching** – a mechanical process of rolling or beating the stems (cf decortication)
- **Shive** – another name for the hurd

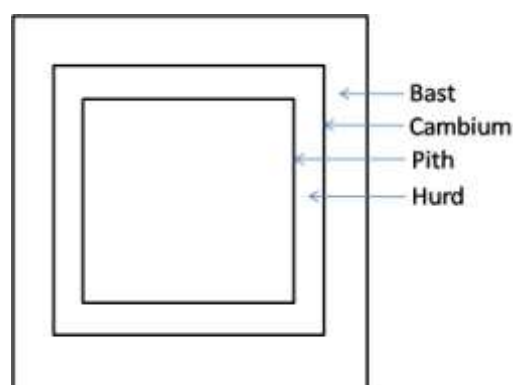


Fig 1: Schematic cross section of hemp stem

## SITE

Industrial hemp will tolerate quite a broad spectrum of soil types. However, very light or very heavy soils should be avoided. Best growth occurs on fairly deep, fairly free draining clay loam type soils. The ideal pH range is usually quoted as around pH6. Hemp will not thrive in acid soils. If the pH is less than 5.8, liming will be required.

## SOWING

Hemp is sown after the risks of hard frosts have passed – this is late April to early May for most of Wales, when surface soil temperatures are around 8°C. Sowing density is related to the variety of hemp being grown and the desired final crop. Different growers and researchers have used sowing rates to achieve plant densities ranging from 150/m<sup>2</sup> to 300/m<sup>2</sup>. The higher densities are associated with weedy soils (quicker canopy cover establishment to out compete weeds) and fibre production.

## **CROP MANAGEMENT**

### **Fertilisers**

One of the attractions of hemp is its low input requirement. Fertiliser regimes should always be tailored to the site and its cropping history. As a rough guideline, hemp usually requires two nitrogen applications: one to the seed bed, the second about a month after sowing. Each application will be in the region of 40 to 60kgN/ha.

### **Weeds**

Once established, and provided establishment is consistent, hemp is able to out-compete most weeds. As a novel crop, there are no products which are specifically licensed for control of pests and weeds in hemp.

### **Pests**

To date, there have been few problems with insect pests in hemp.

Some researchers think that rusts may become a problem in the future if larger areas of the crop are grown. Moulds (both grey and white) can be common, especially in damp summers. For this reason, it is not recommended that hemp follows an oil seed rape crop.

## **HARVESTING**

The precise time of harvesting will depend on local factors and the desired end market. Hemp for fibre is ready for harvest once the majority of its pollen has been shed. Obviously this is considerably before the majority of seed will be ripe. This is one of the conundrums facing growers of dual purpose hemp: they must try to strike a balance between fibre maturity and seed maturity.

Hemp for fibre production is generally “retted” before baling. During the retting process, fungi begin the breakdown of the strong fibre bonds in the crops allowing the shive to be separated from the fibres. If retted in the field, the crop will be mown, swathed and left for up to three weeks, with at least one turning during this time. The straw is then baled. If bales are being stored on-site, they need to be kept dry (target moisture content <15%).

Dual purpose hemp is harvested in a two-step process. First the seed heads are cut, then the straw. This can be achieved in a single operation by adding a sickle bar mower to the combine to operate close to the ground, but this is uncommon.

## **PRODUCTS AND MARKETS**

The potential uses for industrial hemp are diverse. Currently, fibre products from hemp are used as: animal bedding; for making paper; in panel products (e.g. car door panels); as an insulation material; and in combination with cement to make “hemcrete”®. Other uses of the fibres include as fabric (for clothing – apparently the original Levi’s jeans were made from hemp) and in carpets.

Hemp oil is used in cosmetics and toiletries; in paints and varnishes; in margarines and as a cooking oil. The oil is rich in both Omega 3 and Omega 6 (including gamma linolenic) fatty acids. This makes it attractive both to the dietary market and for cosmetics (e.g. face creams).

Hemp seeds are increasingly added to products such as cereal bars, and seeded breads. They are also sold in many shops as a baking ingredient in their own right. The seeds have been used in bird feed for a long time. Hemp can also be used as a wildlife or game cover crop.

## **OUTLOOK**

The prospects for hemp products look good. Hemp fits in well with strategies for minimising inputs into farming systems; producing renewable, non-oil based products; it has the potential to increase carbon storage (e.g. when incorporated into concrete). Interest in “natural” nutritional products and cosmetics is also likely to continue to grow which will support increased production of hemp for its seeds.