

The Future for Hemp
Catherine Wilson
Managing Director, CannaWell
Board Advisor, European Industrial Hemp Association (EIHA) Founder
Member, British Hemp Association (BHA)

The Future for Hemp

International perspective on the rapid rise of hemp cultivation

The need to raise THC levels for EU hemp cultivation to maintain international competitiveness

Council of Europe model to distinguish between foods (including supplements) and medicinal products

Finding a middle ground

International perspective on the rapid rise of hemp cultivation

Hemp is emerging as one of the most rapidly growing agricultural and industrial markets that has emerged for decades

10,000+ applications including

bioplastics, construction, high protein foods and beverages, food supplements, textiles, paper products, composites, biofuel, graphene substitutes

Major environmental benefits

carbon sequestration, enhanced biodiversity, land reclamation and phytoremediation, environmentally responsible industrial and consumer products

Profitable cash crop for farmers when permitted to utilise the whole plant

plus multi billion pound downstream markets

Hemp is a most useful plant

“The production of Hemp is carbon negative, which means it absorbs more carbon from the atmosphere during its growth than is emitted by the equipment used to harvest, process and transport it.”

We have 12 years to limit climate change catastrophe, warns UN

Target 2015 Paris Agreement: global warming to be kept to a maximum of 1.5C to pre-industrial levels.

Target: keep temperatures between 1.5C and 2C. The half-degree difference could also prevent corals from being completely eradicated, ease pressure on the Arctic. Beyond which even half a degree will significantly worsen the risks of drought, floods, extreme heat and poverty for hundreds of millions of people.

At 1.5C the proportion of the global population exposed to water

stress could be 50% lower than at 2C, it notes. Food scarcity would be less of a problem and hundreds of millions fewer people, particularly in poor countries, would be at risk of climate-related poverty.

To keep warming below 2C, countries must triple their current efforts. For the more ambitious target of 1.5C, countries must raise ambitions by five times.

“It’s a line in the sand and what it says to our species is that this is the moment and we must act now,” Debra Roberts, a co-chair of the working group on impacts

Source: Report by the UN Intergovernmental Panel on Climate Change (IPCC)

Rising temperatures, rising risks

Source: IPCC Special Report on Global Warming of 1.5C

Key environmental benefits of hemp

Protects the environment: Hemp can be grown without the use of herbicides, pesticides or fungicides. Hemp is suitable for cultivation near surface water. Hemp is in the top 5 out of 23 crops for biodiversity friendliness, performing better than all major crops such as wheat, maize or rapeseed (Montford and Small, 1999)

Excellent carbon sequestration: One hectare of industrial hemp can absorb 15 tonnes of CO₂ per hectare. Hemp's rapid growth makes it one of the fastest CO₂-to-biomass conversion tools available, more efficient than agro-forestry.

Restores soil health: Due to its vigorous growth, hemp is known to be a pioneer plant that can be used for land reclamation and indeed phytoremediation; 'cleaning' land polluted by heavy metals. Hemp is a valuable preceding crop in rotations. After cultivation the soil is left in optimum condition.

Key environmental benefits of hemp

According to Defra, UK Farming emits a total CO₂ equivalent of 57 million tonnes in green house gases (GHG's). UK agricultural land use is 18.5 million hectares. This amounts to an average of around 3.1 tonnes of CO₂ per hectare total embodied emissions.

In comparison, one hectare of industrial hemp can absorb 15 tonnes of CO₂ per hectare. It is possible to grow two crops per year so CO₂ absorption can be doubled.

Hemp contains around 65-70% cellulose (wood contains around 40%, flax 65-75%, and cotton up to 90%); Hemp represents a sustainable and carbon negative source of plasticizing material.

China banned imports of waste plastics from 1 January 2018. For Britain this represents a plastic mountain of approx. 750,000 tonnes per annum. Whilst some is recycled, using landfill for plastics is a loss of valuable and limited landfill capacity.

Key environmental benefits of hemp

Making one tonne of steel emits 1.46 tonnes of CO₂ and 198kg of CO₂ is emitted to make one tonne of reinforced concrete. One square metre of timber framed, hemp-lime wall (weighing 120kg), after allowing for the energy cost of transporting and assembling the materials actually stores 35.5kg of CO₂.

Body panels and chassis components made from hemp are lighter weight than steel or metal which improves fuel efficiency and are far more dent resistant than steel. Every bit of plastic, carpeting and upholstery in a car can be made of hemp.

"Porsche's smoking hot new race car, the 718 Cayman GT4 Clubsport features composite doors that use an organic fibre mix from hemp and flax. Porsche says the organic ingredients used are agricultural by-products, making it more environmentally friendly."

Source: FoxNews

International Hemp Cultivation

Canada – 56k hectares in 2017 – 1,200 licensed growers Source: Govt of Canada

USA – 10k hectares in 2017, 32k hectares in 2018, Hemp Farm Bill signed Dec 18, industry expects an explosion of hemp cultivation

Source: Hemp Report

China – Within a few years from 1k to over 100k hectares in 2018. Massive R&D efforts to make fine hemp fibres as a large-scale alternative to cotton

Add: India, Australia, New Zealand, Israel, Turkey, various African nations – expect 1 million+ hectares in 2020

Current hemp market value

The hemp sector, especially the hemp extracts business, has increased considerably over the last few years.

Hemp products have reached a market value in the US of \$688 million in 2016 and exceeded an estimated global value of 1 billion € in 2017.

However, EIHA estimate that the European market value is only in the region of 120 Million €.

Together with the cannabinoid industry in Israel and the textile industry in China, current estimate is 1.5 Billion € in 2018.

Hemp is considered one of the most rapidly emerging markets worldwide.

Blockages to growth and achieving international competitiveness

Myths and misconceptions about hemp – Education of all stakeholders

Complex licensing procedures – The need to designate hemp as an agricultural crop

Uncompetitive THC levels for hemp seeds which are permitted to be grow in EU – Raise THC levels to 0.3% in line with international standards

Restrictions on the use of the green parts – Secure whole plant utilisation

Resolve above blockages to facilitate grants and attract investment in R&D and market development funding

The UK has a real opportunity to play a leading role in the development and expansion of a unique industry; bringing a new 'cash-crop' to UK agriculture, creating jobs across the entire supply chain and establishing a 'hemp innovation' hub for Europe.

Cannabis (plant) is the genus in the family Cannabaceae

References: UNODC (United National Office on Drugs and Crime): Recommended methods for the identification and analysis of cannabis and cannabis products, UN New York, 2009, p. 29

The need to raise EU THC levels back to 0.3%

From 1976 to 1991 hemp farmers were allowed to plant seeds with a concentration of 0.3 % THC (dry weight basis) to distinguish between "hemp" (non-drug Cannabis) and "marijuana" (drug Cannabis). Since then, the 0.3% THC limit value for industrial hemp has been used internationally. Before the level was 0.5%.

The limit was then lowered from 0.3 % to 0.2 % in 1991, supposed to prevent the cultivation off illicit drug type Cannabis (i.e. marijuana) in industrial hemp fields. Yet, no evidence has ever been presented to support the effectiveness of this measure.

A lower THC limit value in Europe (0.2%) restricts the choice of varieties for European farmers. Thus, the hemp food industry in Europe has a significant competitive disadvantage to producers in

Switzerland, North America, Asia and Canada (limits from 0.3% up to 1%).

European hemp producers cultivate around 60 varieties. Increasing the THC level back to 0.3% would enable us to choose from more than 500 varieties. These varieties, with a higher THC level, are more resistant to diseases, have robust fibres and grow rapidly.

Source: EIHA Press Release: CAP Reform, an opportunity to enhance hemp varieties

It is predicted that over 2.66 million Brits are set to move from meat & dairy to a plant based diet in 2019. Hemp can provide the ideal protein to satisfy this growing demand.

Hemp CBD Extracts

Perhaps the most important botanical food in recent decades Extracts and tinctures were sold still in the first decades of 20th century and resembled modern-day food supplements or OTC preparations.

Cannabidiol or CBD was first isolated by a team of chemists at the University of Illinois back in 1940 (Adams).

Its structure was elucidated in 1963 (Mechoulam et al.).

CBD is the most abundant cannabinoid present in industrial hemp and is non-psychoactive and non-intoxicating, neither is CBDA.

Total CBD-content in green parts of EU-registered varieties is between 1 and 5 % depending the variety and climate. This is the naturally occurring level of total CBD.

WHO on CBD and extracts

"There are no case reports of abuse or dependence relating to the use of pure CBD. No public health problems have been associated with CBD use."

"CBD has been found to be generally well tolerated with a good safety profile."

-Excerpts from a letter of WHO Director General to Secretary-General of the United Nations, July 23, 2018

"Hemp seeds possess an extremely high nutritional value due to a high content of unsaturated fatty acids (about 80% of fatty acids) and proteins (about 25%). It is not to be ruled out that other minor components, such as terpenes and cannabinoids, could contribute to the surprising beneficial effects of hemp seeds."

- WHO Expert Committee on Drug Dependence Pre-Review, Extracts and tinctures of cannabis, Section 1: Chemistry, WHO, 2018 page 21

Council of Europe, Public Health Committee (Partial Agreement)

Homeostasis – a model to distinguish between foods (including supplements) and medicinal products.

Our society increasingly sees a desire to supplement the daily diet with efficient, natural and nutrition related solutions in order to improve the quality of one's life.

The population grows older which increases social security costs. Improving health is not only positive for the individual, but benefits the entire population and society.

Hemp CBD extracts can be considered a functional, health promoting and health maintaining ingredient.

The evolution of health promoting products narrow the distance between food and medicines. Whilst food stuffs maintain, support and optimize homeostasis, medicinal products restore, correct and modify it.

Finding max. Allowable CBD Dosage for Food Use

Preparation: Extraction Methods

Hemp extracts are prepared by using extraction solvents allowed for food.

Attachment I of Directive 2009/32/EC gives us a clear understanding on extraction solvents used in the production of foodstuffs and which solvents may be used in processing foods:

Propane
Butane
Ethyl acetate
Ethanol
Carbon dioxide
Acetone
Nitrous oxide

✓ Therefore solvent extraction processes (including CO₂) are approved for food stuffs.

✓ The use of Ethanol or Carbon dioxide is allowed for all uses since before 1997

under Council Directive 88/344 EEC.

✓ The solvent extraction process is a traditional food preparation process.

Extract Preparation: Processing

Traditional food preparation processes are used for hemp extracts. After extraction of plant matter a further removal of unwanted

residuals such as waxes may be done by Refrigeration/Freezing, and removal of other contaminants may be done by Distillation/rectification which are considered traditional food preparation processes as per Annex II of Regulation (EC) No. 1334/2008.

Summary

Hemp cultivation and processing will offer substantial job creation, especially for rural economies.

At the same time cultivating hemp contributes to substantial carbon sequestration and soil health restoration.

CBD represents the most profitable by-product of the hemp plant.

The regulated, permitted use of the flower and whole plant is essential to attracting investment into R&D of main stream environmentally responsible products, such as biodegradable plastics and further uses for composite and construction materials.

Europe's farmers and the hemp industry are well regulated, experienced and ideally placed to financially benefit from one of the fastest growing industries in today's market. For hemp to be a viable cash crop for our farmers and processors, they need to be empowered to utilise the entire plant.

Removing barriers to growth in the UK

We need a UK version of the US Hemp Farm Bill.

This can be achieved through a footnote to the 'Misuse of Drugs Regulations 2010' excluding all cultivars (current and planned) associated with low THC industrial hemp plants from the regulations. Licences to be granted for the growing and processing of said cultivars for all parts of the plant and for all applications.

There is an urgent need for these changes to ensure that our country is not left behind and can therefore benefit from what is rapidly becoming a multi billion € industry whilst reducing carbon emissions and supporting the health of the nation.

When asking an industry colleague why he is still in hemp considering the difficulties we encounter, he answered that "when we start to understand hemp we become morally obligated."

It becomes our individual and collective responsibility to work together to make this happen

Any questions?

Catherine Wilson

Managing Director, CannaWell

Board Advisor, European Industrial Hemp Association (EIHA) Founder Member, British Hemp Association (BHA)

