

## Biology & Interesting facts

- Botanical name: *Cannabis sativa L.*
- Summer annual crop, strongly photoperiod sensitive
- Mostly dioecious – male and female occur on separate plants
- Some commercial varieties are monoecious (male and female on same plant)
- One of the oldest non-food crops
- Genetically close to medical hemp or marijuana which led to a ban on its cultivation in Europe post WWII
- Differs from marijuana in containing < 0.2-0.3% THC (delta-9-tetrahydrocannabinol) the psychoactive ingredient in marijuana but contains high levels of cannabidiol (CBD)
- The 1990s marked renewal of hemp – several EU countries passed laws to allow Industrial Hemp farming.
- France – the leading producer of Hemp in Europe



## Agronomy

### Cultivar selection

- depends on the harvestable component of interest (fibre, grain or cannabinoids or dual/biomass use)
- key to successful production of all hemp types
- the most important varietal trait is *days to maturity*
- First time hemp growers will need to understand varietal options that are available and carefully determine which hemp variety is most suitable to their production and marketing strategies

### Conditions

General agronomic recommendations for the main harvestable components of industrial hemp

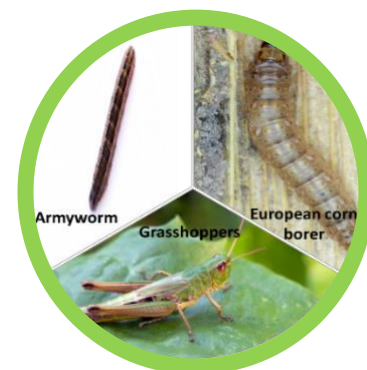
	Fibre	Grain/Dual Purpose**	Cannabinoids
<b>Seeding rate*</b>	40-60 PLS/A	30-40 PLS/A	30-40 PLS/A
<b>Rowing space</b>	8 inches	8-16 inches	8-16 inches
<b>Soil pH</b>	6.2-6.5	6.2-6.5	6.2-6.5
<b>Applied nitrogen</b>	50 lb/A	100 lb/A	50-100 lb/A
<b>Available phosphorous</b>	60 lb/A	60 lb/A	60 lb/A
<b>Available potassium</b>	300 lb/A	300 lb/A	300 lb/A
<b>Harvesting time</b>	<math>\leq 20\%</math> male flowering	~70% grain maturity	~75% trichome maturity

\*Pure live seed (PLS) per acre \*\* Dual purpose grown for biomass

- Seed germination is impacted by lack of soil moisture at planting – seeds sensitive to lack of soil moisture
- Once successfully established, plants are very hardy

## Insects and Diseases

- Insects reported to cause damage include; armyworm, grasshoppers, European corn borer.
- Plant diseases reported - Grey mould (*Botrytis cinerea*) and white mould (*Sclerotinia sclerotiorum*)
- No pesticide materials are currently registered for use on hemp - more research is needed to minimize these potential challenges



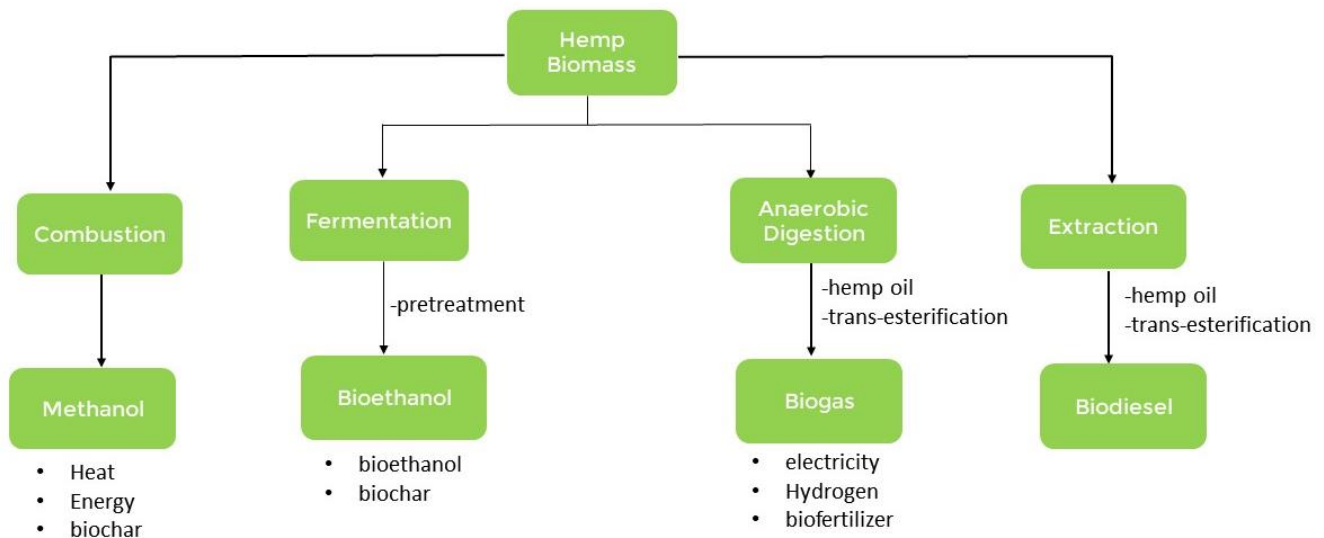
## Hemp Cultivation in the UK

- Cannabis is a Class B controlled drug under the Misuse of Drugs Act 1971 (MDA 1971)
- **Home Office** license required for both cultivation and possession
- License covers low THC cannabis grown for commercial production of hemp fibre or seed oil
- After harvesting non-controlled parts (stalk and seeds) are used
- Controlled parts (leaves and flowers) are retted at licensed location or lawfully disposed of



## An Excellent Biomass Crop

- High yield – up to 15 t/ha air dried biomass
- Direct combustion – heat, energy and biofuels
- Hemp oil – conversion to liquid biofuel
- Higher concentration of digestible cellulose and hemicellulose in bast fibres
- Higher ratio of digestible sugars to lignin in stems
- High calorific value of biomass



## Industrial hemp can contribute to achieving the UK's climate change targets

### Carbon sequestration

- Can grow up to 5 m in 3 months sequestering 10 - 15 tonnes of carbon/ ha – the **fastest plant sequester**

### Phytoremediation

- Little to no pesticides required
- Long tap root system that can extract pollutants and toxins
- Restores condition of topsoil

### Carbon Neutral products

- Biodegradable products from hemp can replace plastic

