Topic: Farm to fork strategy: Sustainable green food production in the changing environment.

The **Farm to Fork** Strategy aims to accelerate our transition to a sustainable food system that should:

From farm to fork is the European strategy developed to control all stages of the food chain, including upstream industries that supply inputs to farmers.

The Farm to Fork Strategy is at the heart of the European Green Deal, which aims to make food systems fairer, healthier and greener, and to reduce the carbon footprint of our food.

The central idea is to minimize the distance and processes that food undergoes between its origin in the fields to the final consumer.

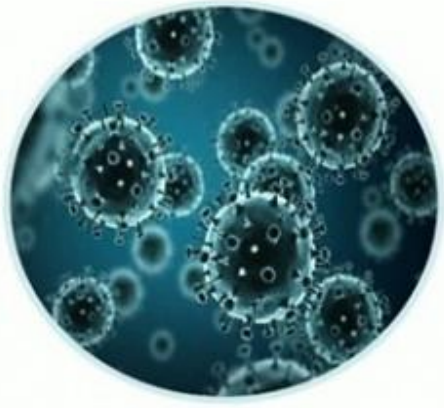
The strategy, adopted in May 2020, has since set the following targets

https://food.ec.europa.eu/sites/default/files/styles/embed_medium_2x/public/2020-05/food_farm2fork_ring.jpg?itok=9r2CPBeL

2030 Targets for sustainable food production

Reduce by 50% the overall use and risk of **chemical pesticides** and reduce use by 50% of more hazardous **pesticides**

Reduce **nutrient losses** by at least 50% while ensuring no deterioration in soil fertility; this will reduce use of **fertilisers** by at least 20 %



Reduce sales of **antimicrobials** for farmed animals by 50%

Achieve at least 25% of the EU's agricultural land under **organic farming** and a significant increase in **organic aquaculture**

https://www.cleanenergywire.org/sites/default/files/styles/gallery_image/public/paragraphs/images/f2f-targets-eu-illustration.jpg?itok=lbkcVEnq

Circu Med

https://www.hempoffset.com/why-2024-is-the-year-of-hemp-top-5-reasons/

European Union of Hemp

Med food

Hemp cultivation contributes to the European Green Deal objectives

Hemp has many environmental benefits.

Breaking the cycle of diseases:

Carbon storage:

Biodiversity:

Soil erosion prevention:

Low or no use of pesticides:

Hemp Can Reduce Carbon Dioxide in the Air

- Hemp is a plant that absorbs carbon dioxide. Hemp is a plant that absorbs carbon dioxide. one hectare of hemp sequesters 9 to 15 tonnes of CO2, similar to the amount sequestered by a young forest, but it only takes five months to grow.
- Hemp can also release CO2 back into the soil through biosequestration.
- This is a process by which a harvested plant slowly decomposes. Harvested hemp produces charcoal-like biochar when smoldered slowly after harvest. Mixing this biochar into the soil means the carbon is returned to the soil rather than released into the atmosphere.

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.hempoffset.com%2Fwhy-2024-is-the-year-of-hemp-top-5-reasons%

Hempcrete Reduces Carbon Emission

A recent report from the United Nations Environment Program mentions that the construction industry is responsible for up to 30% of the total greenhouse gas emissions globally. This industry also accounts for about 40% of the total global energy consumption.

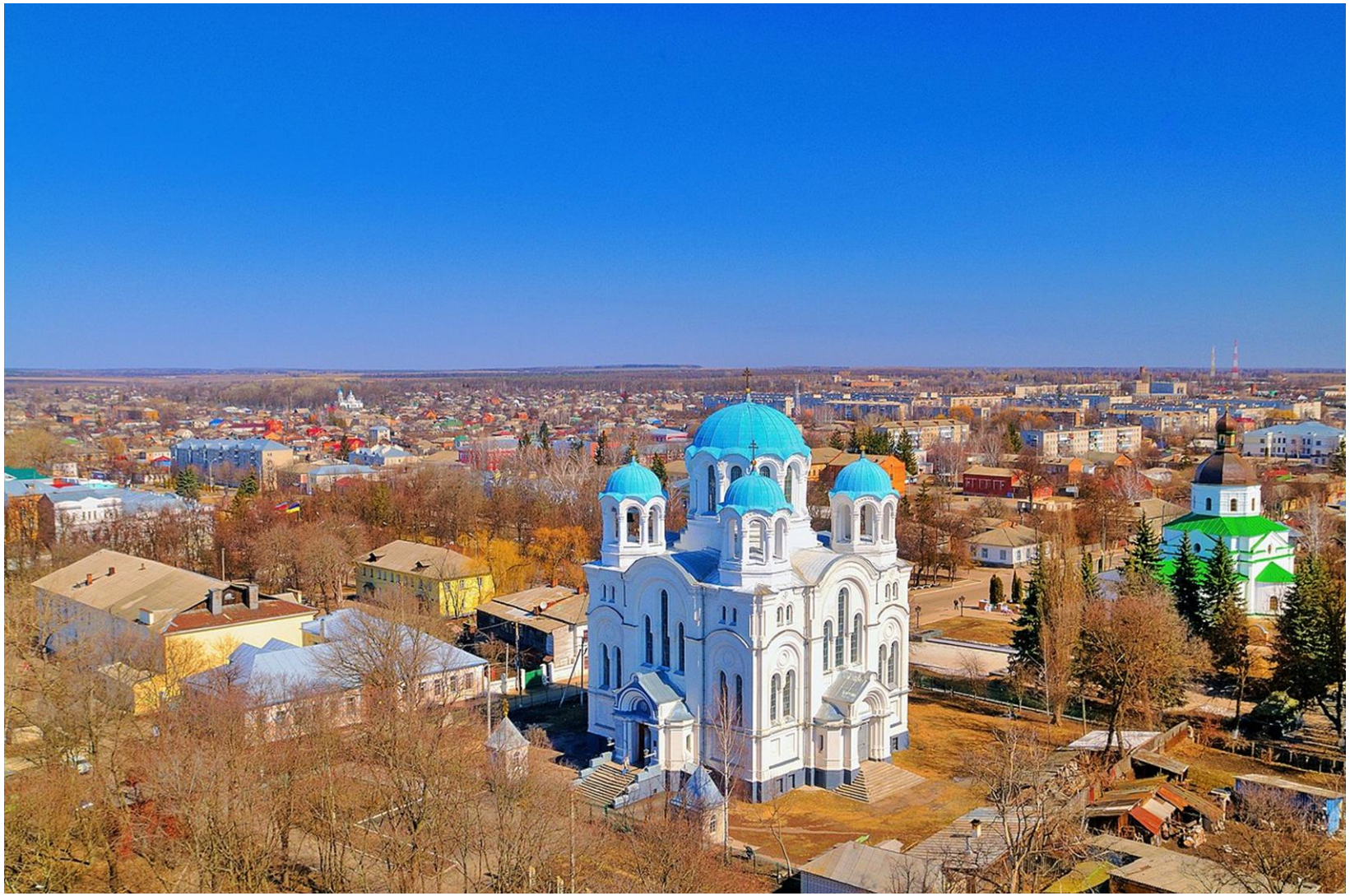
The Department for Business, Innovation & Skills, Government of UK, mentions that one square meter of hempcrete wall framed by timber can store up to 35.5 kg of CO2. That is after absorbing the energy cost of transportation and assembling of the materials.

The process of making a Hempcrete

https://images.adsttc.com/media/images/6066/2aef/f91c/8171/5b00/0e3f/slideshow/hempcrete-5.jpg?1617308388

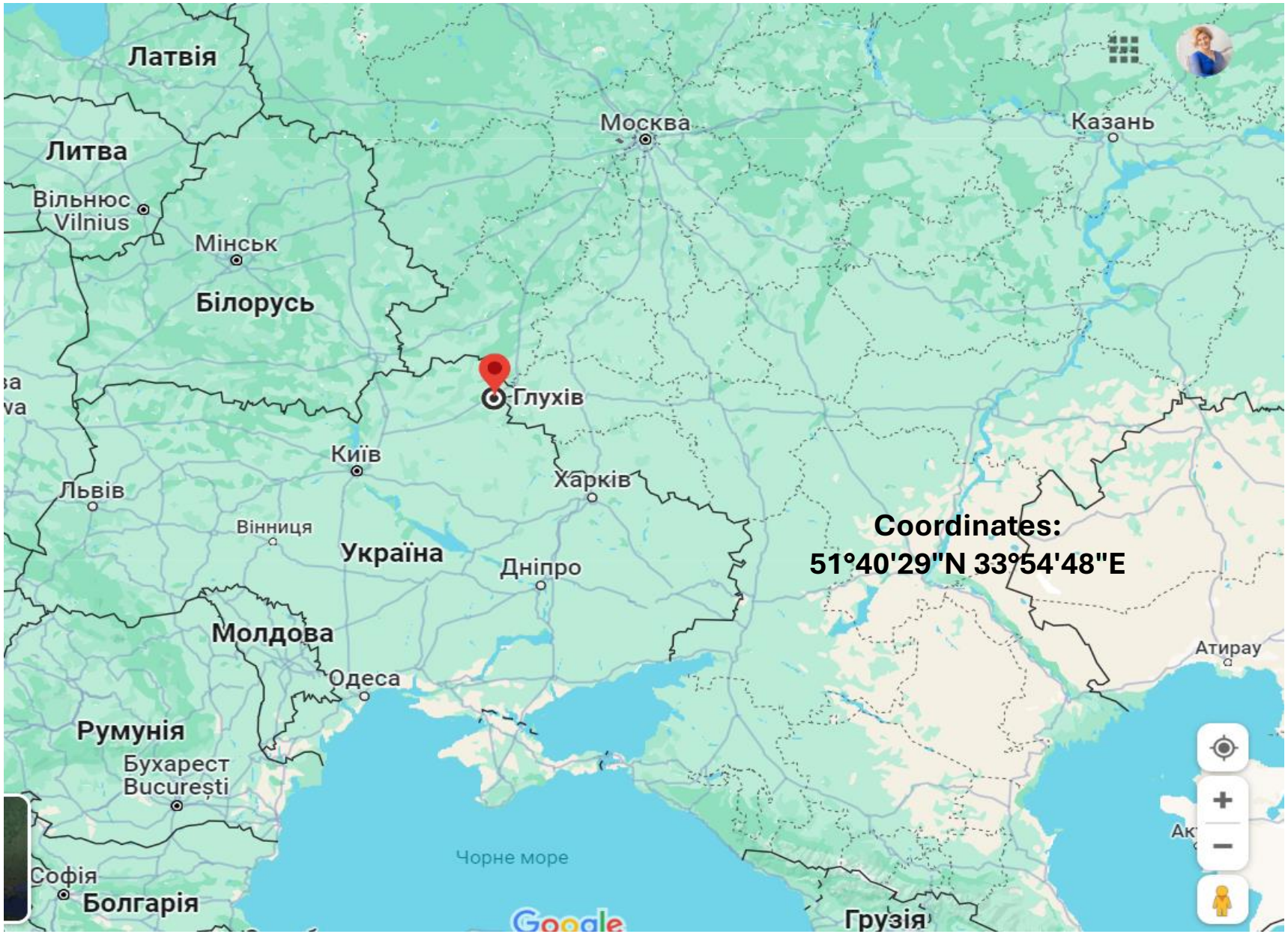
The Hlukhiv city

https://uk.wikipedia.org/wiki/%D0%93%D0%BB%D1%83%D1%85%D1%96%D0%B2



Hlukhiv [ˈɦɫu.xʲʲiu̯] is a small historic city on the Esman River. It belongs to Shostka Raion of Sumy Oblast of Ukraine. Population: 31,789 (2022 estimate).

Geographical location of the city of Hlukhiv



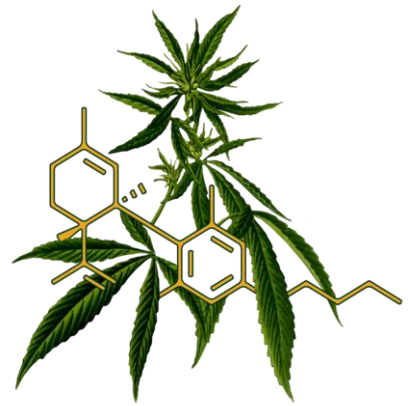
THE INSTITUTE OF BAST CROPS IS THE MAIN INSTITUTION FOR SCIENTIFIC SUPPORT OF THE FLAX AND HEMP INDUSTRIES IN UKRAINE, A PRODUCER OF ORIGINAL AND ELITE SEEDS OF BAST AND GRAIN CROPS

The Research Institute of Hemp was founded in 1931.

What is industrial hemp?

- «Industrial hemp» means an annual bast fibrous plant of the family Cannabinaceae (hemp), species C.sativa L. (cultivated hemp (var. culta)), intended for the production of fibre and seed, with a tetrahydrocannabinol (narcotic substance) content in the leaves and inflorescences not exceeding the legal limit.

Permissible THC content in different countries:
Canada - 0,3%;
European countries – 0,2%;
Ukraine– 0,08%



For the cultivation of industrial hemp in Ukraine it is necessary to have a licence.

Main directions of scientific work of the IBC

– Breeding of fibre flax and hemp.
– Production of original seeds of the varieties of the Institute's selection.
– Technology of growing of bast crops.
– Mechanization of harvesting of fibre flax and hemp.
– Primary processing of flax and hemp raw materials.
– Standardization of the products of bast crops.
– Economy of the branches of flax- and hemp-growing.
– Primary and elite seed-growing of the varieties of grain crops, potato and grasses.
– Manufacture and trials of experimental samples of the machinery for flax and hemp harvesting and processing.

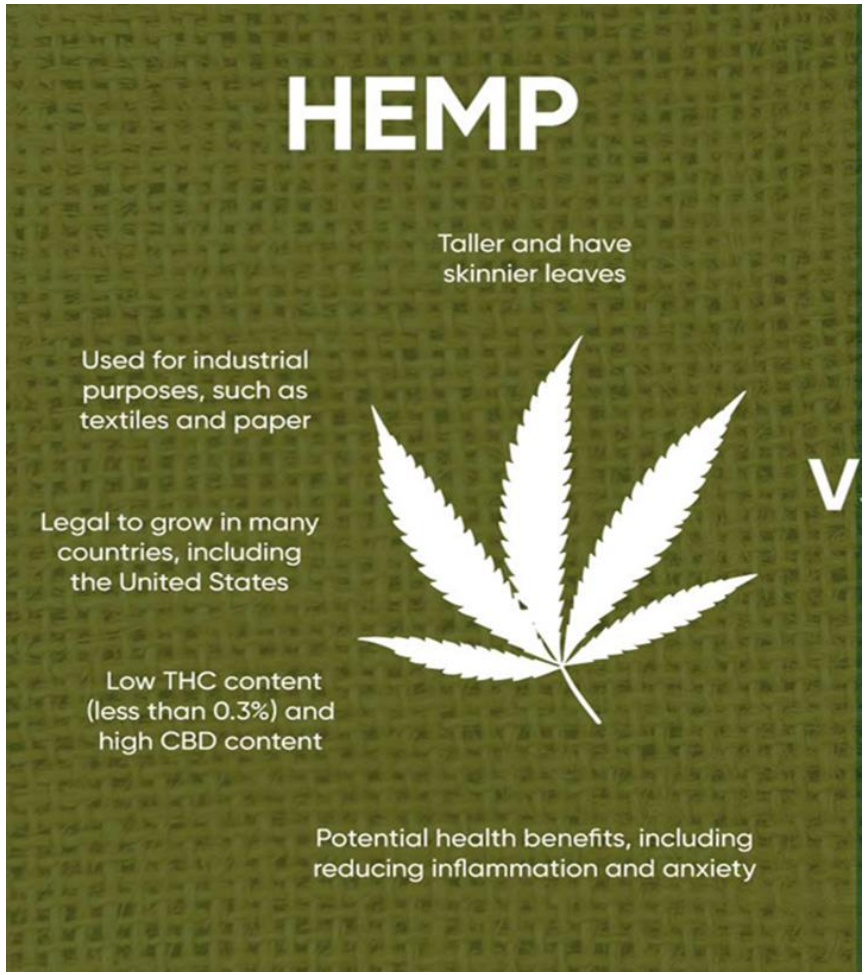
The structure of the IBC

- Department of the flax breeding and seed production
- Department of hemp breeding and seed production
- Department of the engineering and technical research
- Department of research on intellectual property and innovation marketing
- agricultural production department

The national hemp collection contains 500 species from 27 countries. The most commonly grown varieties in the Sumy region are:

Industrial hemp

- Glassia
- Artemida
- Garmonia
- Glukhovsky 85, 51



Industrial hemp GLASSIA

- Industrial hemp GLASSIA is a type of hemp cultivated specifically for its high levels of CBD (cannabidiol) and low levels of THC (tetrahydrocannabinol). GLASSIA hemp is grown using a number of different methods, including indoor farming, greenhouse farming, and organic farming. The high levels of CBD in GLASSIA make it a popular choice for individuals looking to benefit from the medicinal effects of CBD without the psychoactive effects of THC.

The growing season is 115-120 days. The period to technical maturity is 88-93 days.
Productivity: stems - 7.5-8.0 t/ha;
fibre - 2.0-2.2 t/ha;
seeds - 2.0-2.2 t/ha.
THC content - 0%.
The variety has high seed productivity and a diamond-shaped inflorescence.

Promising varieties of industrial hemp

Artemida

The variety was created by hybridisation of Glessia and Zolotoniski 15 with subsequent individual selection. It combines a high oil content of 39.5% with a high stem yield of 1159 g/m2, seed yield of 212.0 g/m2, technical stem length of 201.9 cm, fibre content of 32.9%, weight of a thousand seeds of 18.0 g and the absence of THC.

Garmonia

The variety was created by hybridisation of Zolotonoski 15 and the Glesia variety with subsequent individual selection. Combines high oil content of 39.0% with high stem yield of 1352 g/m2, total stem length of 278.5 cm, technical stem length of 218.2 cm and absence of THC

Promising varieties of industrial hemp

Glukhovsky 85

(fibre and bioenergy use)The growing season is 122-127 days. Period to technical maturity - 100-105 days.

Productivity:

stems - 11.5-12.5 t/ha;

fibre - 3.0-3.3 t/ha;

seeds - 0.8-0.9 t/ha.

The THC content is 0%.The variety is capable of producing 20 t/ha of dry biomass.

Glukhovsky 51

(for fibre use)

The growing season is 120-125 days.

Period to technical maturity - 95-100 days.

Productivity: stems - 10.0-11.5 t/ha;

fibre - 3.2-3.5 t/ha;

seeds - 0.9-1.0 t/ha.

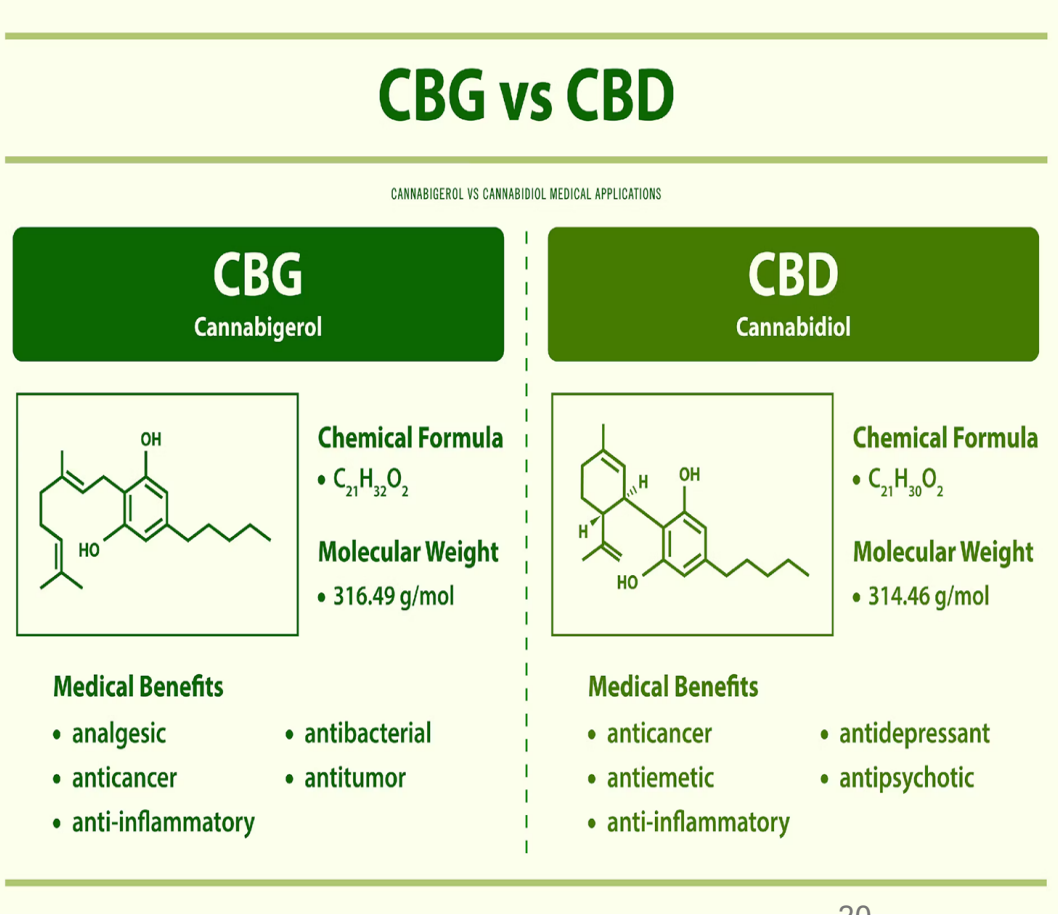
THC content - 0%.

The fibre content in the stems is 38.9%.

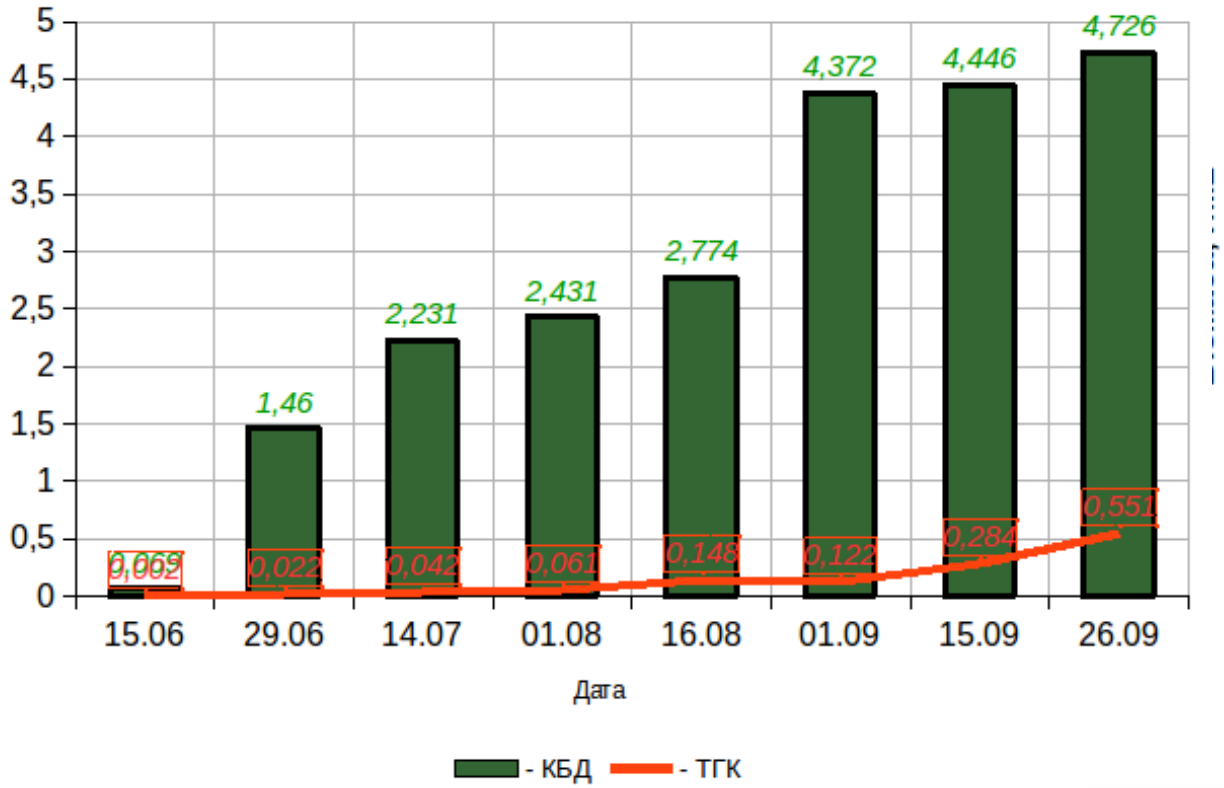
Variety of medical cannabis

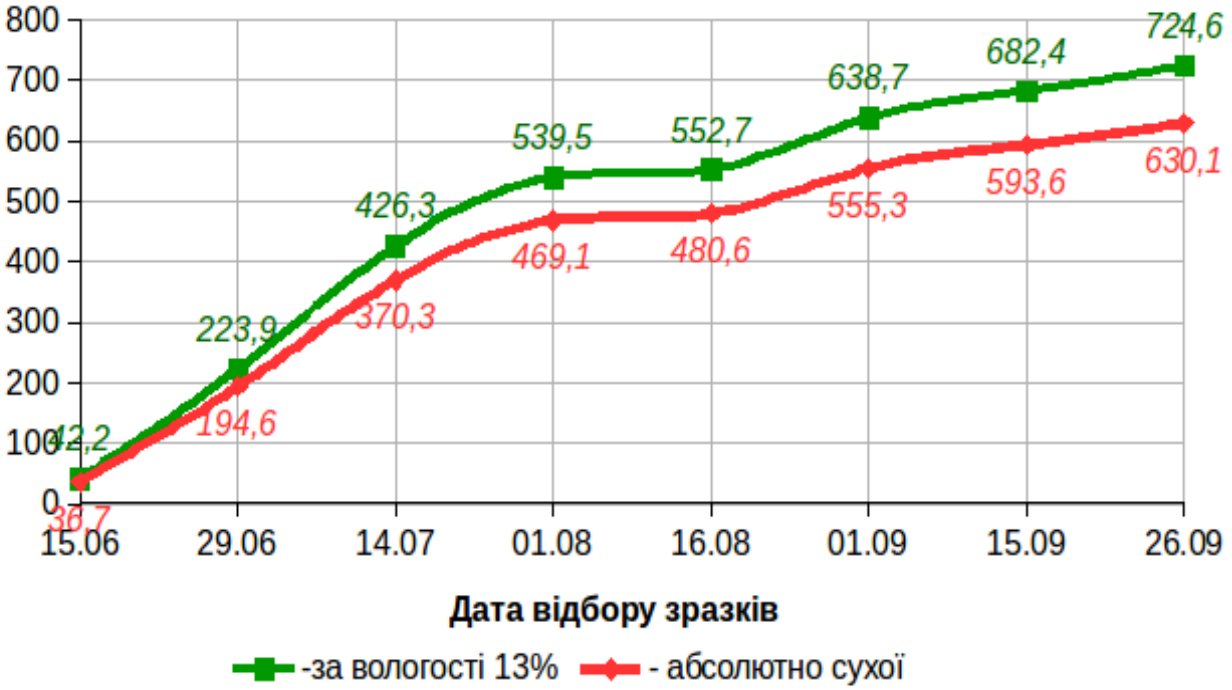
- Vik 2020 is the first variety in Ukraine with a cannabigerol (CBG) content of 3-5%. This compound is not psychotropic and has a number of medicinal properties. The average duration of the period from germination to technical maturity in the climatic conditions of the north-eastern part of Ukraine is 88 days, and 122 days to biological maturity. The average plant height at the end of the growing season is 210 cm. The average yield of stems is 6.3 tonnes per hectare, fibre - 1.4 tonnes per hectare, seeds - 1.4 tonnes per hectare. The fibre content is 25%. The variety was included in the State Register of Varieties Suitable for Distribution in Ukraine in 2021.

Cannabigerol, also known as CBGA, is a non-psychoactive cannabinoid found in cannabis. It is the precursor to both cannabidiol (CBD) and tetrahydrocannabinol (THC), the two most well-known cannabinoids.



Dynamics of CBD and THC accumulation by hemp plants, g/m2





The biomass accumulation dynamics of hemp plants suitable for use as a source of THC range from 223.9 to 724.6 g/m2 in raw materials and from 194.6 to 630.1 g/m2 in dry weight. It is important to note that these values are objective and based on empirical evidence.

Harvesting hemp

https://www.ukrainer.net/wp-content/uploads/2021/08/21.jpg

The process of drying industrial hemp.

https://www.ukrainer.net/wp-content/uploads/2021/08/10-1.jpg

https://www.ukrainer.net/wp-content/uploads/2021/08/9-1.jpg

Stockpiled for sale to a construction

The process of collecting seeds

The process by which hemp stalks are processed into fibers.

The Flax / Linhaça

- Flax, also known as Linum, is a type of plant species mainly cultivated for its fibers and seeds. Within the plant kingdom, flax is classified under the division Magnoliophyta, class Liliopsida, order Asterales, family Linaceae. Flax is one of the oldest cultivated plants, and its uses can be traced back to ancient civilizations. Its fibers are used weaving textiles, making paper, and in insulation, while its seeds are a source of food and oil.

How many types of flax are there in the Ukrainian collection?

- There are only three regions in Ukraine where flax is grown on a large scale - Zhytomyr, Sumy and Chernihiv.

The composition of the flax collection and its origin

type of plant culture	Ukraine	The common wealt of Independent States (CIS)	Other countries	Total number of units	including new varieties
Льон-довгунець Linum usitatissimum	93	338	503	934	1
Льон-межеумок Linum intermedia	11	28	194	233	1
Олійний льон L. flavum	9	9	26	44	3
Декоративний льон Linum grandiflorum.	-	-	5	5	-
Wild relatives	2	1	12	15	3





The flax cultivation

✓ Pros

It is possible to gather a harvest in a short amount of time.

does not require a large consumption of sowing material

does not require watering

unpretentious to the weather condition

get high profit

✓ Cons

demanding on soils

sensitive to weeds

requires the use of pesticides

The need to desiccation flax before harvesting

UKRAINIAN NATIONAL FLAX COLLECTION

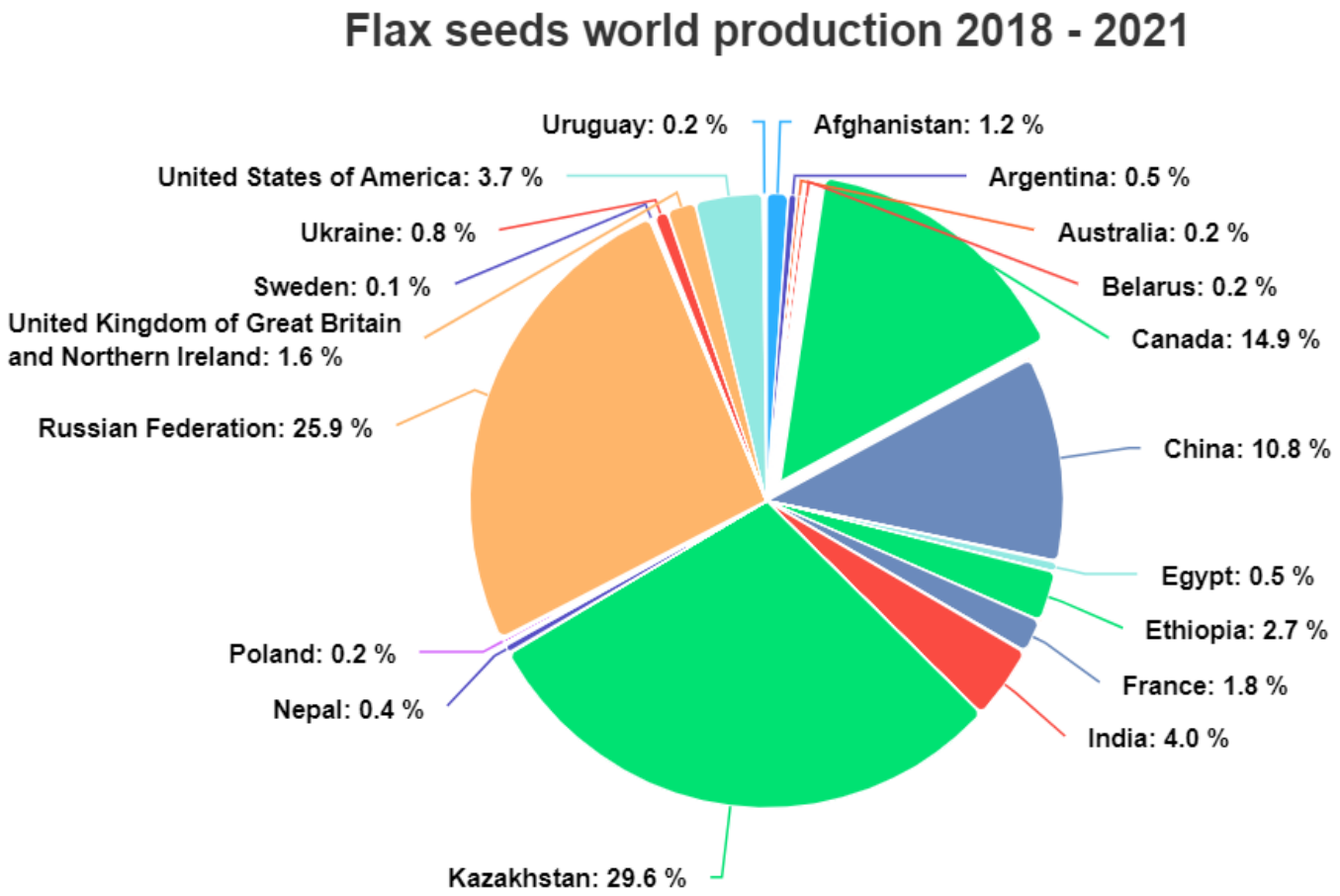



RESEARCH AREAS :

- **searching for and introducing local, domestic and foreign breeding varieties to the gene pool;**
- **studying the flax gene pool for a set of biological and economically valuable traits;**
- **Identification of reference varieties and formation of reference and working collections;**
- **registration of valuable collection specimens;**
- **preservation of samples in storage collections;**
- **certification of flax collection samples, creation of an information database;**
- **use of varieties carrying a complex or individual traits in the development of new varieties.**

Health benefits of seeds

- Organic flax seeds are a unique product in its medicinal properties, which is used to cleanse the body.
- The benefits of flax are due to its richness in B vitamins, vitamins E and D, beta-carotene, calcium, potassium, iron, magnesium, zinc, selenium and other trace elements. Flax is a source of essential polyunsaturated fatty acids Omega-3, Omega-6, Omega-9.
- Flaxseeds are used to boost immunity, fight cardiovascular disease and diabetes. Useful for liver diseases, intestinal and thyroid diseases. In addition, it has an anti-inflammatory effect, improves the condition of hair and skin.
- Nutritional and energy (calorie) value per 100 g of product:
- Proteins – 18.29g
- Fats – 42.16g
- Carbohydrates – 28.8g
- Energy value (calories) – 2236 kJ (534 kcal)
- May contain traces of gluten



Import/Export Statistics

https://commodity-board.com/ukraine-expects-positive-changes-in-the-flaxseed-market-in-2023-24/