

# INDUSTRIAL HEMP





## AN INTRODUCTION

Industrial Hemp is a centuries old crop, that we've only just started re-industrializing.

Over 70 years of prohibition have left the crops trade limited to a few developed nations. Cannabis as God has intended is for the production of food, fiber & medicine.



## BELIZE CANNABIS HISTORY

### **BELIZE CITED AS FAST-GROWING DRUG PRODUCER JUNE 27, 1985 – ASSOCIATED PRESS**

*“Marijuana acreage has increased sixfold since 1982, and net production last year totaled 1,100 metric tons, enough to supply 8 percent of total U.S. consumption, said Judith E. Bertini, the DEA’s chief of operational intelligence.”*

### **BELIZE WARILY CONSIDERS MARIJUANA HERBICIDE OCT 27, 1985 - NYTIMES**

#### **Belize Warily Considers Marijuana Herbicide**

**By DAVID POTT**  
Belize, a small Central American country, is considering the use of a powerful herbicide to wipe out marijuana crops, but officials here are wary of the chemical's safety and effectiveness, according to a report in the New York Times.

The report, which was part of a series of articles on drug production in Central America, said that the Belize government had been considering the use of paraquat, a powerful herbicide, to wipe out marijuana crops. The report said that the government had been considering the use of paraquat for several years, but had been reluctant to do so because of concerns about the chemical's safety and effectiveness.

The report also said that the government had been considering the use of paraquat to wipe out marijuana crops in other Central American countries, but had been reluctant to do so because of concerns about the chemical's safety and effectiveness.

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*“Mr. Esquivel said paraquat spraying in 1983 had been "very successful," eradicating more than 80 percent of the 700 tons of marijuana grown that year. But he said he had "serious reservations" about paraquat's safety.”*

## OUR LEGAL TIMELINE

BELIZE JOINS  
UN SINGLE  
CONVENTION ON  
NARCOTIC DRUGS

December 18 2001

ESTABLISHMENT OF  
CANNABIS  
COMMITTEE TO  
EVALUATE  
DECRIMINALIZATION

July 16 2012

HOUSE OF  
REPRESENTATIVES  
PASSED AN  
AMENDMENT TO THE  
MISUSE OF DRUGS ACT

November 2 2017

FIRST HEMP  
LICENCE ISSUED

Nov 13, 2019

AMENDMENT TO  
THE MISUSE OF  
DRUGS ACT

July 2 2021





# THE ANATOMY OF HEMP

## DIFFERENTIATE BETWEEN MALE AND FEMALE PLANTS

### *Cannabis Sativa L.*

Male Plants (left)

Female Plants (right)

Males pollenate female seed nodes/flowers and thus the result of seed production.

For the production of CBD and Marijuana, the Male plants are eliminated.







## Where to begin?

- Industrial Hemp is a Row Crop. 110-130 Days (Seed to Harvest)
- Tropical Varieties are extremely limited.
- Europe, US, Canada has 1 to 2 growing seasons, **Belize has 3.**

Hemp Cultivars are very specific to application and are broken down into 4 categories.

- Grain/Seed
  - Monocious/Diecious
    - Phenotypes
- Fiber
  - Monocious\*/Diecious
- CBD
  - Diecious
    - Phenotypes
- Dual Purpose
  - Diecious



## HEMP FOR FOOD

Hemp seed is considered by leading researchers to be one of the most nutritious superfoods known to man. This is because hempseed is made up of the ultimate balance of all eight essential fatty acids (EFAs), including a near perfect balance of omega-3 to omega-6.





## Hemp For Food

Is traditionally grown as a seasonal row crop, just as corn or soy. Belize is well suited to grow hemp seed all year round.

Hemp Grain production in recent trials have shown signs of great competitive advantages with average yields grossing 15-20% more per acre, compared to our northern neighbors.

This is in part to our climate zone and the desired conditions for the cultivar.



## HEMP FOR FIBER

Hemp fiber has been used extensively throughout history, with production climaxing soon after being introduced to the New World. For centuries, items ranging from rope, to fabrics, to industrial materials were made from hemp fiber.

With advancements in processing and refinement technologies, hemp fiber is now being utilized in some of the most ingenious ways. From Injection Molding to graphene alternatives for highly efficient batteries, hemp fiber is re-establishing itself as a super material.





## Hemp for Fiber

Is traditionally grown during the longest photo-period available in a growing season. Typically when growing for fiber height and density of stalks determine its application. Thin long stalks are best suited for textiles or paper, whereas thick long stalks are best applied in construction and injection molding.





## HEMP FOR CBD

CBD (*cannabidiol*) is one of 113 identified cannabinoids in cannabis plants and accounts for up to 40% of the plant's extract.

CBD is extracted from the plants biomass, such as leaves and flowers, by several processes.

The quality of CBD oil is determined by its cannabinoid profile, based on the percentages of each cannabinoid.

These compounds alleviate different ailments based on their adjacent receptors in our body, relieving inflammation, pain etc.







## Hemp for CBD

Hemp for CBD is a high-value crop grown more as a horticultural than as an agronomic crop. Practices differ greatly based on cultivars specific requirements.

CBD Hemp grown in the tropics have shown greater morphological volatility due to environmental stresses, and this is exaggerated directly by breeding practices for specific phenotypes.

These phenotypes determine the percentages of different cannabinoids produced by the crop.

Thus resulting in a very climate specific crop.





## DUAL PURPOSE HEMP

Hemp can be grown for its multiple by-products, such as the grain, fiber & biomass in a single rotation. This is a common practice in Romania, Germany and the Netherlands. This is possible due to the advancements in Genetic Sequencing, Harvesting Mechanics; years of investment into infrastructure and agronomical practices.





GROWING HEMP





## THE SEEDS

### 3 – 3.5 MM

Hemp Seeds are small and rather temperamental.

21,000 Seeds x Lb.

### GERMINATION

Within 3-5 Days after a good soak.

Excess water & poor drainage may cause Rot.

### INOCULATION

Is optional, for best results treat seed the same day as planting.



# SOWING CONDITIONS

## FIELD PREP

- Clear Land of All Vegetation
- Interrupt weed Lifecycle
- Fertilize – Yara Mila Complex
- Work soil to be loose and friable
- Smoothen Field Surface & Ensure Good Drainage

## SOIL PH

- 6.5-8.5

## MECHANISED SOWING

- For best results use, a Seed Drill
- Row Spacing of 8-10 Inches

## DEPTH & DENSITY

- Sowing Depth of 0.5” to 1” Max
- Sowing Density of 40 to 50 Lbs x Acre (grain)
- Sowing Density of 55 to 60 Lbs x Acre (fibre)





## WEED MANAGEMENT & PEST CONTROL

### CHEMICAL RESTRICTIONS

Due to the nature of Industrial Hemp as a broadleaf hyperaccumulator, all post emergent herbicides and pesticides are prohibited.

### PRE-EMERGENT HERBICIDES

There are only 2 permitted chemicals:

**S-Metolachlor (Dual Gold)\***

**Pendimethalin (Prowl)\***

### PEST MANAGEMENT

All Non-Organic Pesticides are Prohibited.

Recommendations:

**EM.5 & EM**

### MECHANICAL WEED MANAGEMENT

Mechanical Weed Control is possible within the first 30 days of the crops life cycle.



## WEED MANAGEMENT IS CRITICAL



### 30-45 DAYS

Breaking the weed lifecycle is crucial for the first month.

Ensuring that 0 competition for the crop will allow for it to develop a canopy over the field. Smothering any potential weeds that may grow.

### CROP FAILURE

By using methods such as ***roundup burn downs*** before planting have resulted in mass die-off of germinating plants.

Stunting, branching, Etiolation will be the result of a poorly managed field.



# HARVESTING



## MECHANIZED GRAIN HARVESTING

- John Deere – 2009/Newer
- The draper header is preferred by growers.
- Conventional Auger Header









IMPROVING SOIL WITH HEMP



## BENEFITS OF HEMP ROTATION

### SOIL REMEDIATION

Hemp is considered one of the best hyperaccumulators known to man. Effortlessly absorbing heavy metal contaminants from the soil and incorporating it into its biomass.

### SOIL BUILDING CROP (1 EXCEPTION)

Hemp can be considered a Soil Builder or Destroyer, based on its application.

- Grain Hemp is a soil builder.
- CBD, Fiber & Dual Purpose Hemp are considered soil destroyers.

### EROSION CONTROL

Hemp with a 1.5 – 3 ft root penetration and slow decaying roots, offer a natural and efficient form of erosion control.

### A BREAK FROM CHEMICALS

Due to hems nature as a hyperaccumulator, most chemicals are banned from application on hemp used for human consumption, whether for CBD or Food. This gives farmers an opportunity to rebuild soil health, 1 rotation at a time.









Kenaf

Sorghum

Hemp

Sorghum

Sunn Hemp

Hemp

Sunn Hemp

Sunn Hemp

Sunn Hemp

Sorghum

Sorghum

Hemp

Maize

Kenaf







# Efficacy of dietary hempseed oil in patients with atopic dermatitis

JAMES CALLAWAY<sup>1</sup>, URSULA SCHWAB<sup>2</sup>, ILKKA HARVIMA<sup>3</sup>, PIRJO HALONEN<sup>4</sup>,  
OTTO MYKKÄNEN<sup>2</sup>, PEKKA HYVÖNEN<sup>5</sup> & TOMI JÄRVINEN<sup>1</sup>


*Departments of <sup>1</sup>Pharmaceutical Chemistry, <sup>2</sup>Clinical Nutrition, <sup>5</sup>Clinical Research Centre and <sup>4</sup>Computing Center,  
University of Kuopio and <sup>3</sup>Department of Dermatology, Kuopio University Hospital, Finland*

[https://www.researchgate.net/publication/7724411\\_Efficacy\\_of\\_dietary\\_hempseed\\_oil\\_in\\_patients\\_with\\_atopic\\_dermatitis](https://www.researchgate.net/publication/7724411_Efficacy_of_dietary_hempseed_oil_in_patients_with_atopic_dermatitis)

## Remediation of Benzo[a]pyrene and Chrysene-Contaminated **Soil** with Industrial **Hemp** (*Cannabis sativa*)

S Campbell, D Paquin, JD Awaya... - International journal of ..., 2002 - Taylor & Francis

... **Hemp** showed a very high tolerance to the contaminants. The growth rates of **hemp**, compared with control, in **soils** ... to study **hemp** tolerance to highly PAHscontaminated **soil** and to ...

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## Phytoremediation Potential of **Hemp** (*Cannabis sativa* L.): Identification and Characterization of Heavy Metals Responsive Genes

R Ahmad, Z Tehsin, ST Malik, SA Asad... - CLEAN-**Soil**, Air ..., 2016 - Wiley Online Library

... 1), makes it suitable to be considered in **soil remediation** processes. In addition, a number ... **hemp** plants increases with the increasing concentration of metals in the growing solution/**soil**. ...

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## Nitrogen fertilizer ameliorate the **remedial** capacity of industrial **hemp** (*Cannabis sativa* L.) grown in lead contaminated **soil**

G Deng, M Yang, MH Saleem, M Rehman... - Journal of Plant ..., 2021 - Taylor & Francis

... potential of industrial **hemp** on lead (Pb) contaminated **soil**, a pot ... The **soil** was artificially spiked with Pb using PbCl<sub>2</sub>. Lead ... of industrial **hemp** in **remediation** of polluted **soils** should be ...

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[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=hemp+soil+remediation&oq=Hemp](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=hemp+soil+remediation&oq=Hemp)



<https://www.projectcbd.org/culture/hemp-mythos-monoculture>

A photograph of a vast field of hemp plants in the foreground, with rolling hills and mountains in the background under a clear sky. The text is overlaid on the left side of the image.

# HEMP: FROM MYTHOS TO MONOCULTURE

The Curious Cultural Trajectory of Industrial Cannabis

By Bill Weinberg on August 27, 2020



<https://www.ancient-hebrew.org/studies-words/facts-about-kaneh-bosem.htm>





THANK YOU

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