



TROPICALTM
HEMP_{CORP}

REGENERATIVE AGRICULTURE

FOOD AND INDUSTRIAL HEMP PROJECT COLOMBIA 2024 - 2030

Pablo Andrés Falla – Co-Founder and President,
Co-Chairman, National Hemp Association
CEO Co-Founder Tropical Cannabis S.A.S

Partner Companies

TROPICALTM
CANNABIS_{S.A.S.}
SEEDS OF LIFE
COLOMBIA | VALLE DEL CAUCA


TROPICALTM
FARMERS_{CORP}
SOUL FARMERS
USA | OCALA - FLORIDA




UNITED NATIONS AGENDA 2030

SUSTAINABLE DEVELOPMENT GOALS



The 17 Goals of the Agenda were developed through public consultations, interaction with civil society and negotiations among countries and they imply a common and universal commitment to sustainable development.



GLOSSARY OF TERMS

- **Legal framework:** The industrial and scientific use of hemp is already a reality in Colombia since the Congress of the Republic approved Law 2204 which allows the use of fibers and grains of this material whose content of tetrahydrocannabinol (THC), salts and acid forms is equal to or less than 1%.
- **Industrialization Law:** The national government recently issued Resolution 227 of 2022, which establishes the mechanisms and procedures for the industrial use of cannabis in sectors such as food, beverages and also textile uses as an added value.
- **Decortication:** the mechanical process of removing the outer layer or crust of a structure.
- **Short fiber:** the inner woody core of the hemp crop
- **Seed:** hemp seed is a 100% digestible protein with a 35% oil, fatty acid composition and contains 20-30% carbohydrates, 10-15% insoluble fiber, vitamins and different minerals important for many enzyme systems.



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1. Vision and context.
2. Regenerative agriculture: CO2 capture and nitrogen fixation in soils.
2. Benefits: Social, economic and sustainability.
3. Encourage inclusive Colombian agriculture in all communities through the cultivation of food and industrial hemp.
4. Crop substitution.
5. Food security.



EXECUTIVE OVERVIEW

- The hemp plant as a whole has a large market share in terms of applications for sustainable solutions in everyday life with a socio-economic impact nationally.
- Colombia being geographically positioned with 5 active borders becomes a future center of integral development for all Latin American and Caribbean nations.
- Effective industrialization processes to achieve a circular economy and valuation of the Country Project.
- Latin American and Caribbean reference in tropicalized genetics of high industrial and nutritional value.
- Crop substitution through food and industrial hemp.
- Co2 and Nitrogen capture fixation in the soil.



VISION AND CONTEXT





VISION

The hemp plant as a whole has a large market share in terms of applications for sustainability.

These are solutions in everyday life with a national socio-economic impact:

							
CLIMATE CHANGE	FEEDING	AGRICULTURE	HOUSING	INDUSTRIAL APPLICATIONS	SELF CARE	TEXTILE CONSUMPTION	HEALTH

We fully see the potential of this crop for generations to come.



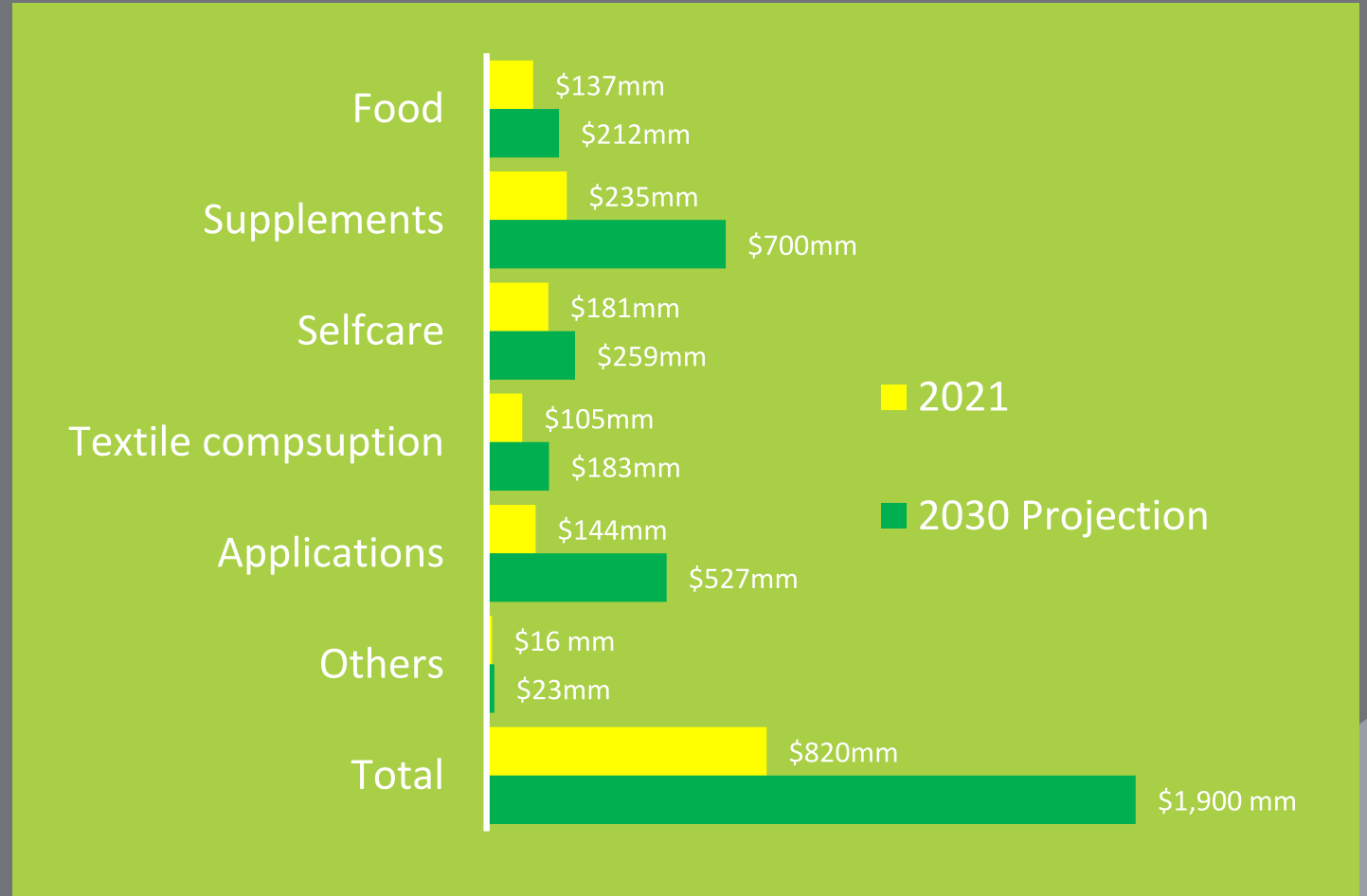
GENERAL VISION

- Food and industrial hemp is grown all over the world. Colombia is showing genetic leadership in the regions.
- Hemp Law 2204 is beginning to be established as a regulatory framework for Latin America and the Caribbean.
- Active participation of regulatory entities supporting the cultivation of food and industrial hemp in Colombia such as:
 - Colombian Agricultural Institute ICA
 - National Cultivar Registry RNC
 - Cannabis Technical Group GTC
 - Ministry of Justice and Law
 - Ministry of Health and Social Protection
 - National Institute for the Surveillance of Medicines and Food (INVIMA)



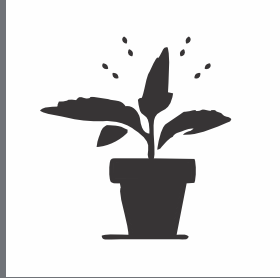
SOCIO-ECONOMIC IMPACT OF HEMP

- By 2030, the industrial use of cannabis will have generated 44,000 jobs in Colombia: Government.
- Taking the United States of America as a reference, the total income from food and industrial hemp cultivation for 2021 was 824 million dollars according to figures reported to the USDA, with a projection for 2030 of an industry of more than 34 billion dollars

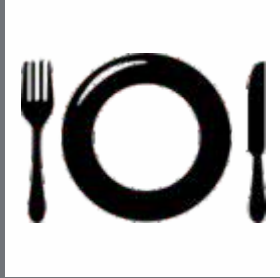




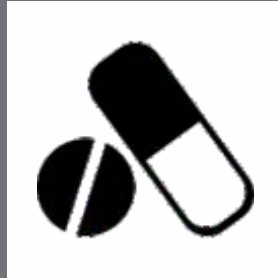
HEMP APPLICATIONS



CLIMATE
CHANGE



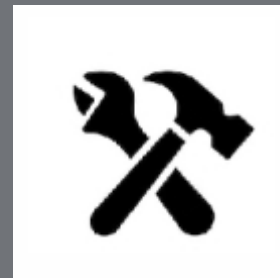
FOOD



MEDICINES



BODY CARE



CONSTRUCTION



PLASTICS



SUPPLEMENTS



BIOFUELS



TEXTILES



PAPER PRODUCTS



CATTLE



FOOD AND INDUSTRIAL HEMP BUSINESS CONSTRUCTION





STEPS TO BUILD A HEMP INDUSTRY

Tropical Hemp Corp. and its allied company Tropical Cannabis SAS, began the process of creating a Food and Industrial Hemp Park to begin product development, research the entire supply chain, research and develop a vertically integrated industry and investigate new hemp products and solutions, all while bringing finished products (food, short fiber, long fiber, seeds and seed oil) to market.

In 1929 the industrial hemp industry started in the Valle del Cauca

[Rev cafetera Col 3\(28 29\)1063-1065.pdf](#)

REVISTA CAFETERA DE COLOMBIA

88 years passed between laws

New cannabis cultivation law approved in Colombia in 2017

[decreto-613-de-2017.pdf](#)

GOVERNMENT



FOOD AND INDUSTRIAL HEMP PARK

The National Center of Excellence for Food and Industrial Hemp will be part of our joint work with governmental institutional entities and national and international institutions of higher learning with the following common objectives:

1. Reviving the food and industrial hemp industry.
2. Establishment of the Research Center in Candelaria-Valley.
3. Create socio-economic development components focused on the reconstruction of communities.
4. General study and creation of a sustainable food and industrial hemp supply chain.



PRODUCT AND RESEARCH PRIORITY: BY MARKET CATEGORY

CO2 CAPTURE

- Analytical methods endorsed by national and international entities to determine CO2 capture on land, based on crops planted in national soils.
- Functionality and future commercialization of Co2.

NITROGEN FIXATION

- Land regeneration through the cultivation of food and industrial hemp.

AGRONOMY

- Maximum economic fertility levels.
- Green manure varieties and termination dates for maximum soil nutrition.
- Effects of planting dates, yield, height, biomass, and biomass.
- Economics of soil amendments and fertilization.
- Evaluation of new products or methods for weed control - Minor Use - conventional and biological.
- Pest controls.

HEMP SEED BANK

- Development of a germplasm bank
- Plant breeding without the use of GMOs
- Cultivation variety recommended for different thermal zones.
- Continuous research to improve genetic qualities

TOP QUALITY SEEDS FOR PLANTING

Tropical Hemp developed and tropicalized food and industrial hemp seeds for propagation and extension crops for our Latin American and Caribbean communities, being pioneers in the field.

FIBER

- Fiber yield/fiber quality of seed varieties vs. dual-purpose varieties.
- Harvesting dual-purpose varieties to maximize fiber quality.
- Drying methods to meet specific requirements of various fiber end users.
- New uses of hemp post-decortication residues.
- Life cycle analysis and recyclability of hemp fiber products.



PRODUCT AND RESEARCH PRIORITY: BY MARKET AREA

BIOSAFETY

- Uses of hemp's antimicrobial properties incorporated into bandages, hospital uniforms and gowns, sheets, towels, privacy curtains and any other fabric used in a hospital environment.
- Research on hemp bioplastics for use in prosthetics.
- Replacement artery research.

FOOD SAFETY

- Protein content above 32% in varieties registered with the FNC.

BIOFUELS/INDUSTRIAL HEMPOIL

- Development of hemp as a biofuel.
- Bioplastics research
- Use of hemp as a potential industrial lubricant.
- Research on pelletized hemp as fuel.
- Injection molded plastics

HIGH-TECH APPLICATIONS

- Nanolayer technology
- Advanced graphene replacement textiles with the ability to charge devices.
- 3D printing: everything from small "plastic" items to 3D printed houses.
- Research on all possibilities with the electrical properties of hemp
- Biodegradable



SOCIAL, SUSTAINABILITY AND ECONOMIC BENEFITS





WHY HEMP IS OF NATIONAL AND PUBLIC INTEREST



The vision for the hemp value chain in Colombia is that of an industry that is significant in terms of future acreage under cultivation, agricultural income per hectare, processor and manufacturer revenues, and consumer product sales.

If these outcomes are achieved, there will be significant benefits for hemp producers, consumers of hemp products, the broader hemp industry and the Colombian economy in general.



HEMP COMPLIES WITH GOVERNMENTAL PRINCIPLES

1. Food security.
2. Maximize the capacity of Colombian agriculture.
3. Create and generate new sources of employment.
4. Inclusive to all our fellow countrymen.
5. Quality of life.
6. Protection of our natural resources.
7. Compensation through CO2 capture.

**HEMP CONTRIBUTES TO EACH
OF THESE PRINCIPLES!**



WHY HEMP IS IN THE PUBLIC AND NATIONAL INTEREST: PRODUCERS AND CONSUMERS

PRODUCERS WILL BENEFIT FROM:

- Increased sales and higher economic returns from hemp cultivation as a result of expanding domestic and export markets.
- A high yield per hectare crop with relatively low crop input costs.
- Faster advances in research related to hemp production and management, whether for seed or fiber applications.
- Opportunities created to diversify agricultural production.

CONSUMERS WILL BENEFIT FROM:

- Increased access to hemp food products, hemp ingredients, consumer care and fiber products.
- A credible, reliable and accessible source of science-based facts, information and opinions on all issues related to our hemp industry.
- Increased awareness of the nutritional value of hemp-based food products and ingredients and the unique applications and benefits of hemp fiber products.
- Create emphasis on food safety and raw food processing systems.



WHY HEMP IS OF NATIONAL INTEREST: THE HEMP INDUSTRY AND THE COLOMBIAN ECONOMY

A BROADER HEMP INDUSTRY WILL BENEFIT FROM:

- A credible, trusted and effective voice with the ability to understand and address industry challenges and thus gain competitiveness domestically and internationally for the demand for hemp products.
- Development of industry standards for future national and international growth.
- A credible partner for research and promotion initiatives.

THE COLOMBIAN ECONOMY WILL BENEFIT FROM:

- Higher contributions to GDP as value-added jobs are added to the agricultural sector.
- Generation of increased revenues from exports of high value-added hemp products.
- Strengthening of Colombia's knowledge base and expertise in research related to hemp products and future commercialization of hemp products.



FOOD AND INDUSTRIAL HEMP PARK



We have advanced with certifications of good agricultural practices for the future challenge of guaranteeing food security for our fellow citizens.

A global population growth of 9 billion is expected by 2050, which requires constant innovations to ensure food production and food security for a growing population.



**TO ENCOURAGE INCLUSIVE
COLOMBIAN AGRICULTURE IN ALL
COMMUNITIES THROUGH THE
CULTIVATION OF FOOD AND
INDUSTRIAL HEMP.**



INDIGENOUS AND AFRO-DESCENDANT COMMUNITIES



Encourage our communities by facilitating the obtaining of licenses for the cultivation of food and industrial hemp, providing them with comprehensive support in all phases of cultivation and the future commercialization of their harvests.

ABOUT HEMP



CULTIVATION OF THE HEMP PLANT

Compared to other crops, the advantages of hemp cultivation are boundless. Hemp fiber grows incredibly fast and is therefore available in large quantities. This miracle plant enriches the soil, can be fully utilized, grown without chemicals and perfectly represents the concept of circular economy.

BENEFITS OF FOOD AND INDUSTRIAL HEMP CULTIVATION

- It thrives in virtually any climate, grows quickly and requires little maintenance.
- No need for chemicals and resistant to pests and diseases.
- Uses very little water per pound of fiber.
- Stores CO2 during growth, positive for CO2 balance
- Enriches soil, ideal for crop rotation
- Thrives in neutral PH



SEED AND FIBER

CHARACTERISTICS

Hemp seeds are among the most nutritious foods. Our genetics contain 32.7% protein and all the essential fatty acids (Omega 3, 6 and 9), essential amino acids and dietary fibers necessary for good health. Hemp seed oil pressed from seeds has a wide range of applications.



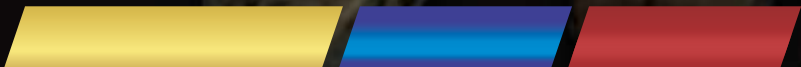
Resultados_O2022-17.pdf

APPLICATIONS

The oil and seeds are used for human consumption in nutrition and nutritional supplements (nutraceuticals) but are also processed into canaryseed and other animal feeds. Hemp seed oil is also well suited for cosmetic and health-promoting products.



Resultados_T2022-70.pdf





WOOD CORE OF THE HEMP FIBER PLANT

CHARACTERISTICS

Short fiber (Hurd), the woody interior of the hemp stalk, has an enormous absorption capacity and therefore binds well to materials such as lime and water; one of the best applications being the production of paper.

APPLICATIONS

The woody interior of the hemp (Hurd) stalk is extremely versatile. Well suited as stable bedding (straw) for horse and small animal enclosures, horticultural mulch, but also for insulating panel material and hemp concrete.



HEMP FIBER PLANT OUTER LAYER



CHARACTERISTICS

The long fibers are extracted from the bark on the outer side of the stalk. Hemp fibers have great moisture and temperature regulation properties and are also extremely strong, very flexible and light, which is a huge advantage in the textile sector. In addition, its strong antibacterial properties make it ideal for hospital supplies.

APPLICATIONS

Hemp fibers can be made into almost anything. They are used in construction and insulation materials, in filters, in growing media, and in many industrial applications such as the automotive, paper and textile industries.



HEMP FIBER PLANT ROOT

CHARACTERISTICS

The roots of the hemp plant are deep and wide with an extensive root hair structure. This improves soil structure and returns a higher yield to the soil.

APPLICATIONS

For Tropical Hemp, the root plays a major role in soil improvement, allowing more of this super plant to be grown. In addition, the roots are used in the production of pharmaceuticals.



HARVESTING, PROCESSING AND DECORTICATION



Definition: decortication:

The removal of the outer layer or crust of a structure.





THE HEMP PLANT - APPLICATIONS

							
CLIMATE CHANGE	FEEDING	AGRICULTURE	HOUSING	INDUSTRIAL APPLICATIONS	SELF CARE	TEXTILE CONSUMPTION	HEALTH



APPLICATIONS - FOOD SAFETY



HEMP PROTEIN POWDER

Hemp protein powder is made from crushed hemp seeds and contains all the healthy substances offered by the hemp plant. It is an abundant source of healthy plant protein and many other nutrients that contribute to a healthy, fit and active life.



HEMP SEEDS

Hemp seeds are a superfood in their own right, they are also one of the healthiest foods around and are full of essential fatty acids (Omega 3, 6, 9), essential amino acids and dietary fiber: the foundation for a healthy body.



HEMP SEED OIL

Hemp seed oil is extracted from the seeds of the fiber plant and is ultra healthy. Hemp seed oil consists of 75-80% polyunsaturated fatty acids (the good fats!). This oil is packed with antioxidants and valuable minerals. Hemp seed oil is considered the most balanced vegetable oil available.



APPLICATIONS - CONSTRUCTION



High-quality building materials are produced from industrial hemp fibre. All hemp products are guaranteed free of harmful substances, causing little or no risk of skin and respiratory irritation during installation and are extremely durable. The basis for natural comfort.



APPLICATIONS - CONSTRUCTION



HEMP BLOCKS

Lightweight hemp blocks
Hemp blocks Their thermal properties eliminate the need for a cavity wall!



HEMP PANELS

Highly insulating and hydrating board material for external wall insulation and roof constructions.



INSULATION

This line of insulating materials is well suited for thermal and acoustic insulation of ceilings, walls and floors.



HEMP FILTER

This non-woven filter has elasticity and high acoustic absorption.



HEMP FIBER FOR A SUSTAINABLE FUTURE



Hemp fiber is the natural and environmentally friendly alternative for industrial applications. It's quite simple: hemp fiber with a supplement of biodegradables can be used as an alternative to plastic, cotton, wood, steel and synthetics, and a version of hemp can be produced: from clothing to paper, from tableware to car parts and scooters, from musical instruments to bird food, from yoga mats to furniture. There are literally endless possibilities.

BENEFITS OF HEMP-BASED INDUSTRIAL APPLICATIONS

Hemp automotive interior parts are lighter and safer compared to fiberglass. They are also lighter and more durable than steel and will not rust. Hemp-based building materials are easier to use than glass- or rock wool-based materials. Hemp paper lasts many times longer than paper from trees. Bioplastic is many times stronger than oil-based plastic - and biodegradable! The production of petrochemical plastics generates huge CO2 emissions. Hemp actually absorbs CO2! Cotton production requires large amounts of pesticides - hemp requires virtually none! With the development of hemp nanomaterials, hemp fiber even becomes suitable for use in batteries and accumulators.



BIOFUEL - BIOHEMP



Unlike the gasoline we are all familiar with, **biofuel is made from living organisms**: from plant materials to other substances such as animal fat and vegetable oil. They are usually blended with normal fuel to create a product that is less harmful to the environment.

Biofuels are fuels obtained from biomass, considered second-generation biofuels that are obtained from wood, organic waste and biomass crops. These materials are pre-treated and will also be converted into ethanol as the final product.

The most obvious advantage of switching to biofuel is its environmental impact. Because it is made from organic matter, it absorbs carbon dioxide. When the biofuel is combusted in an engine, the carbon dioxide is released back into the atmosphere. **This recycling system does not cause an accumulation of CO₂, thus reducing the contribution to global warming.**





BIOFUEL PRODUCED FROM HEMP OIL INDUSTRIAL



INTRODUCTION AND EXPLANATION

The need to reduce our dependence on fossil fuels and confront climate change leads us to look for renewable and sustainable energy sources. An emerging option is biofuel produced from industrial hemp oil.

Here we present our objectives:

- Inform about the hemp biofuel production process.
- Highlight its properties and advantages compared to other types of fuels.
- Examine its potential in the current energy market.
- Demonstrate how hemp can transform our energy matrix towards a more sustainable future.

Biofuel is a renewable and biodegradable fuel that is produced from various sources of vegetable oils or animal fats. Here are its main features:

Production	Use	Ecological Advantages
It is obtained through a process called transesterification, which transforms the triglycerides present in oils and fats into methyl esters, the main components of biofuel.	Biofuel can be used in standard diesel engines without the need for modifications. It can be used pure (B100) or mixed with petroleum diesel in various proportions.	Being a renewable fuel, the use of biofuel reduces the emission of greenhouse gases, contributing to mitigating climate change. In addition, it is less toxic and more biodegradable than petroleum diesel.

Biofuel represents a sustainable and eco-friendly alternative to fossil fuels, helping to build a more sustainable energy future.

OIL TRANSFORMATION HEMP BIOFUEL

The process to convert hemp seed oil into biofuel involves transesterification, a chemical process that uses methanol and KOH (potassium hydroxide). Here the process is described:

1. Oil Extraction

The first step is the extraction of the oil from the hemp seeds. This oil will be the raw material for the production of biofuel.

4. Purification

The methyl esters are washed and purified to remove any traces of methanol, catalyst or impurities.

2. Transesterification

In this stage, hemp oil is reacted with methanol in the presence of a catalyst (KOH). This reaction produces methyl esters (components of biofuel) and glycerin as a byproduct.

3. Separation

The methyl esters and glycerin separate due to the difference in their densities. The glycerin settles to the bottom and is removed.

5. Hemp Biofuel

The final product is a clean and renewable fuel, ready to be used in any standard diesel engine.

Thus, through an efficient and ecological process, hemp seed oil is transformed into biofuel, sustainable energy for our future.

CHEMICAL PROPERTIES OF HEMP BIOFUEL



This biofuel has several important chemical properties that affect its performance, these properties largely depend on the composition of the hemp seed oil, which can vary depending on the growing and processing conditions.

Composition of Fatty Acids

Hemp seed oil has a balanced ratio of fatty acids, which can contribute to optimal performance in diesel engines.

Cetane Number

The cetane number is an indicator of the combustion quality of the biofuel. Although this value can vary, generally, hemp biofuel has a cetane number suitable for use in diesel engines.

Oxidation Stability

Hemp biofuel may be less oxidation stable than other biofuels due to its high polyunsaturated fatty acid content. However, this can be mitigated with the use of appropriate antioxidants.

Freezing point:

It has the advantage of having a low solidification point, which allows it to maintain its fluidity at low temperatures, due to its high concentration of polyunsaturated fatty acids, as a result, it is suitable for use in diesel engines even in low temperature conditions.

The viscosity of hemp biofuel is similar to that of other biofuels and is suitable for use in diesel engines.

ENVIRONMENTAL BENEFITS OF HEMP BIOFUEL

Not only is hemp biofuel a renewable alternative to fossil fuels, it also offers several significant environmental benefits:

1. Reduction of Greenhouse Gas Emissions Fewer greenhouse gases are emitted when using hemp biofuel compared to fossil fuels, contributing to the mitigation of climate change.	2. Organic Farming Hemp plants grow faster, require less water and fertilizer than other biofuel crops, and can improve soil health.	3. Biodegradable and Not toxic Hemp biofuel is less toxic and more biodegradable than petroleum diesel, meaning it causes less damage to the environment in the event of a spill.
4. Circular Economy Byproducts such as glycerin and seed residue can be used in other industries, minimizing waste.	5. Biodiversity Growing hemp can support biodiversity, providing habitat for a variety of fauna and flora species.	6. Versatile The remaining biomass has exceptional versatility as it can be harnessed for the production of Biochar and methanol for biofuel, providing two key benefits.

Therefore, the use of hemp biofuel can be an important step towards a greener and more sustainable future.

ECONOMIC ASPECTS OF THE BUSINESS OF HEMP BIOFUEL



- **Production costs:** Although production costs may vary by region and scale, in general, hemp biofuel production can be competitive, especially when environmental benefits and revenue from byproducts are taken into account.
- **Market value:** The biofuel market is growing due to the increasing demand for renewable energy. The diversity of uses of hemp adds value to its cultivation.
- **Incentives and Policies:** Many governments are implementing policies and incentives to promote biofuels, which can improve the economic viability of hemp biofuel.
- **Circular Economy:** Byproducts from hemp processing can generate additional revenue, which can improve the profitability of hemp biofuel.



HEMP BIOCHAR



HEMP BIOCHAR TROPICAL CANNABIS S.A.S



The choice of charcoal type can have a significant impact on environmental and energy aspects, which is why we carried out a comparison of four different charcoal sources: Pine Charcoal, Eucalyptus Charcoal, Mineral Charcoal and Hemp Biochar from Tropical Cannabis SAS. The analysis reveals that Hemp Biochar from Tropical Cannabis SAS is a superior charcoal source in terms of sustainability and environmental benefits, highlighting its potential for industrial applications and its role in reducing harmful emissions.



TECHNICAL ANALYSIS

HIGHER HEATING POWER (PCS):

The PCS is an essential measure of the amount of heat produced by the complete combustion of a unit mass of fuel. Hemp Biochar has a PCS of 12,712 BTU/lb, higher than Pine Charcoal (8,500 BTU/lb) and Eucalyptus Charcoal (9,500 BTU/lb), although it is below Mineral Carbon (14,000 BTU/lb).

FIXED CARBON (% IN WEIGH):

The PCS is an essential measure of the amount of heat produced by the complete combustion of a unit mass of fuel. Hemp Biochar has a PCS of 12,712 BTU/lb, higher than Pine Charcoal (8,500 BTU/lb) and Eucalyptus Charcoal (9,500 BTU/lb), although it is below Mineral Carbon (14,000 BTU/lb).

SULFUR (% IN WEIGH):

Hemp Biochar exhibits considerably lower sulfur content (0.11%) compared to Pine Charcoal (0.5%), Eucalyptus Charcoal (0.5%) and Mineral Charcoal (2.2%). The low presence of sulfur reduces the risk of acid rain and other environmental problems associated with combustion.

ASHES (% IN WEIGH):

Although Hemp Biochar has a higher ash content (11.04%) than charcoal, it is significantly lower than that of mineral coal (17%). The resulting ashes can have a high nutrient content, adding extra value to the product.



COMPARISON OF DIFFERENT TYPES OF COAL

CHARCOAL PINE

HEATING POWER UPPER (BTU/LB)	8500
FIXED CARBON (% BY WEIGHT)	80
SULFUR (% BY WEIGHT)	0,5
ASHES (% BY WEIGHT)	5

CO2 emissions per TON
2,9
Tons

CO2 emissions per TON
9 Kilos

CHARCOAL OF EUCALYPTUS

HEATING POWER UPPER (BTU/LB)	9500
FIXED CARBON (% BY WEIGHT)	85
SULFUR (% BY WEIGHT)	0,5
ASHES (% BY WEIGHT)	3

CO2 emissions per TON
3,1
Tons

CO2 emissions per TON
9 Kilos

MINERAL CARBON

HEATING POWER UPPER (BTU/LB)	14000
FIXED CARBON (% BY WEIGHT)	62,8
SULFUR (% BY WEIGHT)	2,2
ASHES (% BY WEIGHT)	17

CO2 emissions per TON
2,3
Tons

CO2 emissions per TON
40 Kilos

HEMP BIOCHAR TROPICAL CANNABIS SAS

HEATING POWER UPPER (BTU/LB)	12712
FIXED CARBON (% BY WEIGHT)	72,5
SULFUR (% BY WEIGHT)	0,11
ASHES (% BY WEIGHT)	11,04

CO2 emissions per TON
2,68
Tons

CO2 emissions per TON
2 Kilos



ENVIRONMENTAL ANALYSIS

CO2 and SO2 EMISSIONS:

In terms of emissions, Hemp Biochar emits significantly less CO2 (2.68 tons per ton incinerated) and SO2 (2 kilos per ton incinerated) compared to other types of coal.

CO2 emissions

Hemp Biochar emits 2.68 tons of CO2 per ton incinerated, which is less than Pine Charcoal (2.9 tons of CO2 per ton incinerated) and Eucalyptus Charcoal (3.1 tons of CO2 per ton cremated). Although mineral carbon emits only 2.3 tons of CO2 per ton incinerated, it is important to keep in mind that it is a non-renewable fossil fuel, so its use contributes significantly to the emission of greenhouse gases.

SO2 emissions

Hemp Biochar emits only 2 kilos of SO2 per ton incinerated, which is much less than Pine Charcoal (9 kilos of SO2 per ton incinerated), Eucalyptus Charcoal (9 kilos of SO2 per ton incinerated). SO2 emissions can cause acid rain and respiratory problems, so reducing these emissions is important to protect health and the environment.

LABORATORY THERMAL RESULTS



TEST REPORT

Report No.: 064-23 Issue date (Y/M/D): 2023-05-03

Applicant information:

Customer: TROPICAL CANNABIS S.A.S
 Customer address: Via Candelaria-Palmira Km 4 310 Corredor El Lauro
 City - Department: Candelaria - Valle

Test information

Type of sample: Biofuel
 Test item identification: Charcoal
 Reception date (Y-M-D): 2023-04-19
 Analysis start date (Y-M-D): 2023-04-19
 End date of analysis (Y-M-D): 2023-05-02

Grades

- Cells in gray correspond to test or calculation activities not carried out.
- Environmental conditions during tests are: Preparation area temperature: 24.4°C; Test area temperature: 20.0°C; Atmospheric pressure: 0.9 Bars. These values meet the requirements for the equipment used.
- Results reported correspond exclusively to the sample supplied by the customer and tested at the facilities of the Fuel Combustion Laboratory (LCC) at Universidad del Valle.
- Without the approval of the Fuel Combustion Laboratory (LCC) this report should not be reproduced, except when reproduced in its entirety.

Digitally signed
 By FRANCISCO JAVIER VELASCO-SARRIA
 Date: 2023.05.03
 09:26:34-05'00'

Approved by: _____
 PHD Francisco Javier Velasco-Sarria

Technical Director
 Laboratorio Combustión Combustibles (LCC)

MAY 04 2023

IVAN VARONA ARAGON
 Official Translator / Interpreter
 English ↔ Spanish
 Colombian Ministry of Justice
 Resolution No. 0290 of 1997

F06-PR4-MC
Version 3.1
Page: 12

Laboratorio Combustión Combustibles
Tel: (57+902) 321 2100 ext. 2135
Calle 13 # 100 - 00
Building E33 - Space 1011
Cali - CO

TEST REPORT

Test item identification in the LCC: 88020 (2023)

Parameter	NEXT ANALYSIS		RESULTS	
	Testing method	Moisture base	Moisture base	Dry basis
Total Moisture (% by weight)*	ASTM D3302/D3302M - 18	26.82		
Volatile Matter (% by weight)*	ASTM D7582-15	12.01		16.44
Ashes (% by weight)*	ASTM D7582-15	8.06		11.04
Fixed Carbon (% by weight)*	ASTM D3172-13	53.00		72.53
Higher Heating Value (kcal/kg)*	ASTM D5855/D5855M - 18	5161.2		7062.2
Higher Heating Value (BTU/lb)*	ASTM D5855/D5855M - 19	9290		12712
Sulfur (% by weight)*	ASTM D4239-18e1, Method A	0.08		0.11

Parameter	ELEMENTAL ANALYSIS		RESULTS	
	Testing method	Moisture base	Moisture base	Dry basis
Total Moisture (% by weight)*	ASTM D3302/D3302	26.82		
Ashes (% by weight)*	ASTM D7582-15	8.06		11.04
Carbon (% by weight)*	ASTM D 5373-21, Method A	58.82		80.49
Hydrogen (% by weight)*	ASTM D 5373-21, Method A	1.71		2.34
Nitrogen (% by weight)*	ASTM D 5373-21, Method A	0.58		0.79
Sulfur (% by weight)*	ASTM D4239-18e1, Method A	0.08		0.11
Oxygen (% by weight)*	ASTM D3176-15	3.91		5.24

Parameter	Testing method	Moisture base	Dry basis
Lower Heating Value (BTU/lb)*	Calculated	9128	12480

Observations: _____

End of Test Report

F06-PR4-MC
Version 3.1
Page 2/2

MAY 04 2023

IVAN VARONA ARAGON
 Official Translator / Interpreter
 English ↔ Spanish
 Colombian Ministry of Justice
 Resolution No. 0290 of 1997

Laboratorio Combustión Combustibles
Tel: (+57 902) 3212100 ext.2135
Calle 13 # 100 - 00
Building E33 - Space 1011 Cali - CO



CONCLUSION

Comparative analysis demonstrates that Hemp Biochar from Tropical Cannabis SAS offers a superior charcoal solution in terms of sustainability and environmental benefits. Although Mineral Coal has a higher superior heating value, its long-term use is unsustainable and more harmful to the environment. In contrast, Hemp Biochar, with its low sulfur content, low CO₂ and SO₂ emissions, and origin from industrial hemp, presents an environmentally friendly and sustainable charcoal option, highlighting its potential for industrial applications and the reduction of harmful emissions.





DEVELOPMENT OF HIGHLY RESISTANT HEFA BIOFUELS AT LOW TEMPERATURES FROM HEMP SEED OIL RICH IN ACID



INTRODUCTION

The world is in search of sustainable alternatives to fossil fuels, Tropical Hemp has stood out for its commitment to innovation in the agricultural and energy sector.

Our company has developed varieties of industrial hemp that not only offer high seed yields but also a significant production of vegetable oil rich in polyunsaturated fatty acids.

These fatty acids are the basis for the production of high-performance biofuels through the HEFA (Hydrotreated Esters and Fatty Acids) process, recognized for its efficiency and cleanliness in the conversion of vegetable oils into distillable hydrocarbons. The choice of hemp seed oil as a raw material is strategic; this process focuses on the

production of kerosene, diesel and gasoline, with improved properties to withstand low temperatures, crucial for applications in cold climates where traditional fuels could fail.

This transformation not only supports environmental sustainability, it also promotes energy independence and offers a viable route to reducing carbon emissions.

We present the innovations in hydroisomerization that allow adjusting the molecular structure of hydrocarbons to optimize their fluidity and stability at extremely low temperatures, being particularly beneficial for kerosene, which is expected to be tested in Colombian Air Force turbines, highlighting its applicability in rigorous operating conditions.



OBJECTIVE

GENERAL OBJECTIVE OF THE PROJECT

To develop an optimized process for the production of HEFA biofuels from hemp seed oil, with a particular focus on the production of aviation biokerosene (SAF) exhibiting exceptional low-temperature resistance properties, as well as high-quality biodiesel and biogasoline.

SPECIFIC OBJECTIVES

Hemp Seed Oil Extraction and Purification:

Optimize oil yield and purity through cold pressing and refining techniques to prepare the ideal feedstock for conversion to biofuels.

Hydrotreatment:

Saturate double bonds and remove impurities such as sulfur and nitrogen to stabilize the oil before more intensive processes.

Hydrodeoxygenation:

Significantly reduce the oxygen content of the oil, transforming oxygenated functional groups into simpler hydrocarbons and water.

Hydrocracking:

Adjusting the length of hydrocarbon chains to suit the specifications of the desired biofuel.

Hydroisomerization:

Modifying the molecular structure of hydrocarbons to improve their fluidity and resistance to low temperatures, focusing on critical properties for biokerosene.

Fractional Distillation:

Separating the hydrocarbon mixture into specific fractions for use as different types of biofuels.

Refining:

Ensuring the purity and quality of each biofuel, removing any traces of other hydrocarbons and impurities.



DESCRIPTION OF BIOFUELS

BIOKEROSENE

This biofuel is the main focus due to its ability to function effectively in low temperature conditions, which is crucial for aviation applications.

BIODIESEL

Produced for use in diesel engines, offering a cleaner alternative compared to fossil diesel.

BIOGASOLINE

Suitable for use in gasoline engines, notable for its sustainable production

BIO GAS

A volatile byproduct used for energy or additional processes within the refinery





DATA ANALYSIS AND EVALUATION

PLAN FOR EVALUATION OF FUELS BY LABORATORY TESTS

We will implement a series of standard tests including chromatographic analysis, flash point tests, and density analysis to verify the compliance of each biofuel with international standards.

METHODS FOR DETERMINING EMISSIONS AND QUALITY TESTS FOR EACH BIOFUEL

We will evaluate the emissions of CO₂, NO_x, and other pollutants for each biofuel, using spectrometry and standard environmental assessment methods, to ensure that they comply with current regulations and offer an improved environmental profile.





DISCUSSION

INTERPRETATION OF EXPECTED RESULTS

We expect to demonstrate that HEFA biofuels produced from hemp seed oil not only meet, but exceed, performance and sustainability standards compared to traditional fossil fuels.

COMPARISON WITH INDUSTRY STANDARDS AND POTENTIAL IMPACT ON THE BIOFUEL MARKET

The superiority of HEFA biofuels, especially in terms of low-temperature adaptability and lower carbon footprint, will position Tropical Hemp as an innovative leader in the energy market.

EVALUATION AND FUTURE PERSPECTIVES

PLANS FOR FUTURE TESTING, INCLUDING TESTING ON COLOMBIAN AIR FORCE TURBINES

We plan to extend the evaluation of biokerosene in test turbines to validate its performance under real operating conditions, seeking additional certifications and adoption in commercial aviation.

POTENTIAL DEVELOPMENTS AND PROCESS IMPROVEMENTS

We will continue to investigate modifications to the HEFA process to increase efficiency and further reduce the carbon footprint, exploring new catalytic technologies and optimized processes





ENERGY COMMUNITIES

INTEGRATION OF INDUSTRIAL HEMP IN
SUSTAINABLE ENERGY GENERATION



INTRODUCTION

Energy Communities: Integrating Industrial Hemp into Sustainable Energy Generation.

This innovative project is designed to transform energy access in the most underserved areas of Colombia, through the use of industrial hemp as a source of biomass.

Our goal is to provide sustainable and accessible electric energy, while promoting economic development and environmental sustainability in rural communities, by integrating advanced energy generation technologies with sustainable agricultural practices, seeking to establish a renewable model that is replicable and scalable, benefiting numerous communities throughout the country.

PRESENTATION



The **Energy Communities** project focuses on building a renewable energy infrastructure that not only solves the energy deficit in rural areas, but also drives socioeconomic development through the creation of local jobs and the promotion of green technologies.

With a power plant based on hemp biomass, the project seeks to establish a sustainable cycle of production and consumption that benefits both the environment and the local economy, laying the foundations for a greener and more equitable energy future in the region.



OBJECTIVES

GENERAL OBJECTIVE OF THE PROJECT

Implement a sustainable energy solution through the use of industrial hemp as biomass for electricity generation, targeting rural and forgotten communities in Colombia, seeking to establish a renewable energy system that is self-sufficient, ecologically and economically viable, thus improving accessibility to energy in areas that currently lack adequate infrastructure.

SPECIFIC OBJECTIVES

Improve Energy Accessibility

Provide continuous and reliable access to electricity in communities that lack connection to the national grid, using renewable and local resources.

Promote Economic Development

Generate employment and development opportunities throughout the hemp value chain, from cultivation to power plant management.

Promote Environmental Sustainability

Reduce the carbon footprint through the use of hemp, a crop that absorbs CO2 during its growth and offers a clean alternative to fossil fuels.

Education and Training

Implement training programs for local communities in hemp cultivation techniques, power plant maintenance, and sustainable environmental management.

Replicability of the Model

Develop a project model that can be replicated in other regions of the country, adapting to different geographic and socioeconomic contexts to expand the positive impact



PROJECT DESCRIPTION

Location: The project will be developed in selected rural areas of Colombia where access to the electrical grid is limited or non-existent. These areas are ideal due to their isolation and need for renewable energy sources, as well as their ability to support the cultivation of industrial hemp.

Biomass Technology to be Used: We will use industrial hemp as the primary source of biomass. This will be processed in a specialized plant that converts the biomass into high-pressure steam. The generated steam will feed a turbine that, in turn, drives an electric generator to produce energy. The selected technology includes:

- **Biomass Boiler:** Designed to maximize the conversion of thermal energy from biomass into mechanical energy.

- **Steam Turbine:** Optimized for the characteristics of steam generated by hemp biomass.
- **Electric Generator:** Converts the mechanical energy of the turbine into electricity, which is then distributed to communities or sold to the national grid.

Electric Power Production Capacity

The plant will have the capacity to generate up to 2 megawatts of electricity, enough to supply the energy needs of several rural communities.

By cultivating approximately 120 hectares of hemp, which can produce between 30 and 40 tons of dry biomass per hectare per year, we ensure a constant supply of raw material for the continuous operation of the plant.

SOCIAL IMPACT

Employment: The implementation and maintenance of the project will generate significant local jobs, from hemp cultivation to the operation and maintenance of the power generation plant. This will provide stable employment opportunities and improve the economic well-being of communities.

Economic Development: By stimulating the local economy through new employment and training opportunities, the project fosters a virtuous economic cycle that can spread to other local sectors.

Improved Access to Energy: Local power generation ensures a reliable and continuous electricity supply, crucial for the development and improvement of the quality of life in previously underserved areas.

ENVIRONMENTAL IMPACT



Carbon Footprint Reduction: Using hemp as a biomass source is an effective way to capture CO₂, thereby mitigating climate change. Unlike fossil fuels, hemp absorbs CO₂ as it grows, significantly reducing global emissions when used as an energy source.

Use of Renewable Resources: Hemp is a renewable resource that can be grown and harvested multiple times a year, ensuring a sustainable and low-impact source for energy production. Its cultivation and processing are less damaging to the environment compared to fossil fuel extraction and processing techniques.



TECHNICAL VISIBILITY

HEMP CULTIVATION

Land Selection: Land chosen for its soil quality and favorable climate conditions.

Sustainable Agricultural Techniques: Organic farming practices and soil conservation.

Crop Cycle: Rapid 90-day cycle, allowing multiple annual harvests for a constant supply of biomass.

BIOMASS CONVERSION PROCESS

Efficient Transformation: Use of specialized boilers to convert biomass into high-pressure steam, maximizing energy conversion.

Boiler Technology: State-of-the-art boilers for optimal energy production.

POWER GENERATION TECHNOLOGY

Steam Turbine: Operation of turbines under specific conditions generated by hemp biomass.

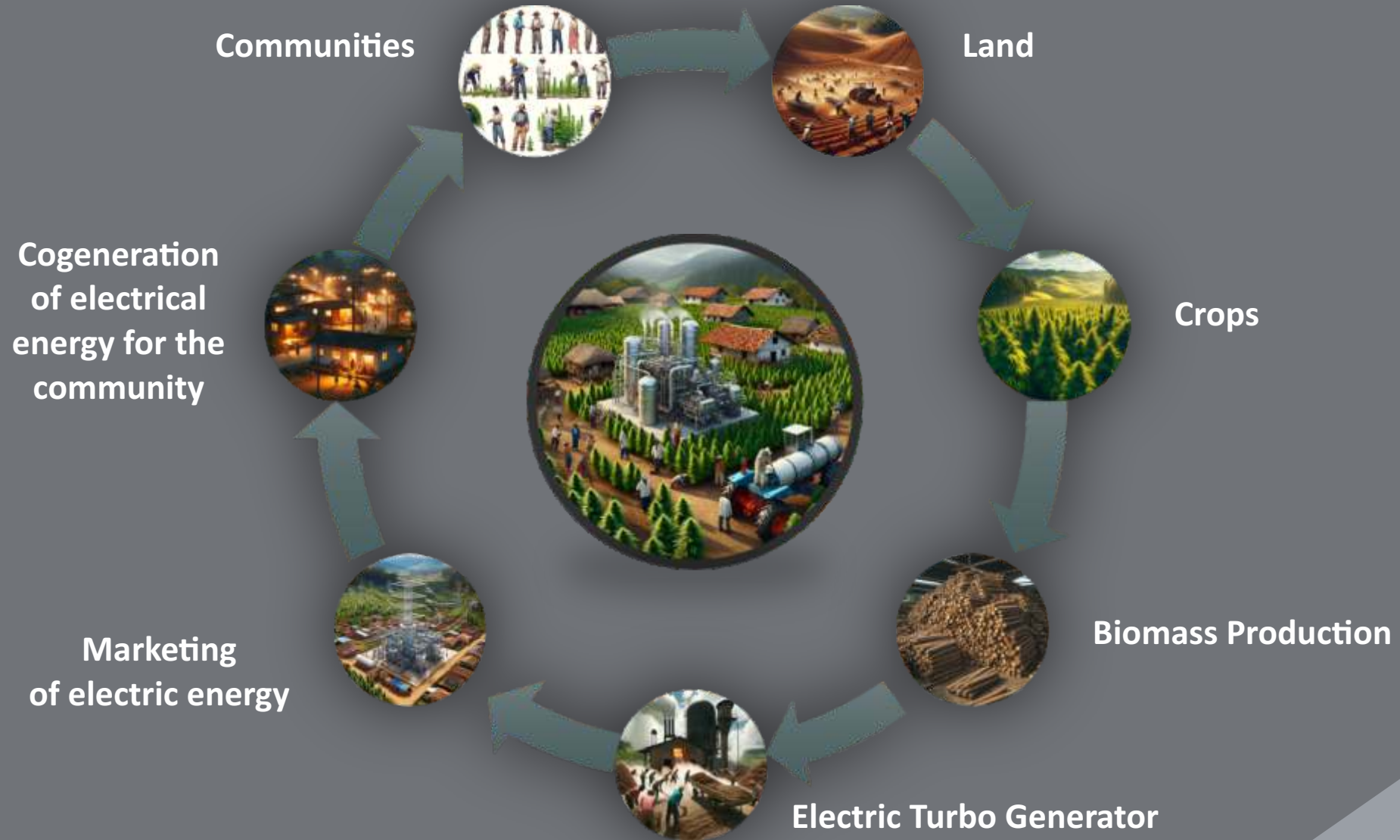
Generation and Distribution: Conversion of mechanical energy into electrical energy, distribution to communities or connection to the national grid.

INNOVATIONS AND APPLIED TECHNOLOGIES

Advanced Monitoring Systems: Real-time control to optimize performance and safety.

Continuous Improvements: Commitment to research to integrate technological advances that increase efficiency and sustainability.

TECHNICAL VISIBILITY



BENEFITS FOR THE GOVERNMENT

Fulfillment of Sustainable Development Goals: Supporting this project underscores the country's commitment to sustainability and climate change, highlighting its leadership in the adoption of renewable energy.

Positive Social Impact: Improves local infrastructure and provides sustainable and accessible energy, significantly raising the quality of life and creating both direct and indirect employment opportunities.

Innovation and Technology Transfer: Incentivizes innovation and sets precedents for future developments in green technology, reinforcing the country's position as a leader in the sector.

Replicable and Scalable Model: Serves as a sustainable model that can be replicated in other regions, optimizing investment in renewable energy and extending its benefits nationwide.

LICENSES AND REGULATORY FRAMEWORK



Seed:

1. National Seed Registry
2. Seed Certification
3. Seed multiplication permit
4. Registration of seed importers and exporters
5. Compliance with phytosanitary standards

Energy:

1. Environmental License
2. Connection and Operation Permit
3. Water Concession (if applicable)
4. Generation Project Registration
5. Construction and Land Use Permit

Ministry of Justice and Ministry of Health:

1. License for the use of seeds for sowing
2. License for the cultivation of non-psychoactive cannabis
3. License for psychoactive cannabis
4. License for the production of derivatives



BIOPLASTICS



When the first plastics were produced, they were all made from organic materials, not synthetics, and back then, cellulose was a key element of the fledgling plastics industry. Currently, bioplastics have returned to arouse great interest due to their different environmental benefits.

Bioplastic materials, such as those made from hemp, have important advantages for the environment, since they are not made from fossil fuels, they do not produce carbon dioxide when they decompose. Also, most are biodegradable.

The use of hemp not only implies an ecological commitment, but also improves the quality and performance of the products that contain it, which is why it is a very important part of the solution to the climate crisis.





INDUSTRIAL APPLICATIONS



HEMP CELLULOSE

Our hemp cellulose is the ideal raw material for paper production, using an average of 10 thousand liters of water per ton Vs. pine paper which uses an average of 66 thousand liters of water per ton, given our lignin percentages.



SHORT HEPM FIBER

Our short hemp fiber is used for the production of glass nanocellulose for different applications in the construction industry.



ANIMAL CARE



HEMP FOR ANIMAL NUTRITION

Given the protein content of our genetics, it is ideal for the production of livestock concentrates, thus substituting fishmeal or corn as a protein source.

BENEFITS OF HEMP PRODUCTS FOR ANIMAL CARE

Hygienic and dust-free, less chance of respiratory problems and allergic reactions, Cushioning and non-clotting, ideal for hooved animals, Antibacterial and antifungal effects, For animal enclosures of all sizes, Stimulates natural behavior, such as nesting, Absorbs moisture and odors, 100% natural, fully compostable For happy pets!



ANIMAL CARE - PRODUCTS



SHORT HEMP FIBER BEDDING

Natural bedding bedding for horse stalls and other enclosures - healthy for respiratory tract and hooves!

SHORT FIBER BEDDING FOR HEMP BEDDING BIOBASE

Stable bedding with added eucalyptus oil, especially for horses with respiratory problems.



HORTICULTURE



NATURAL HORTICULTURE WITH HEMP FIBER

Hemp horticultural products are made from industrial hemp fiber, completely natural and free of harmful substances and pollution. Suitable for all sizes of 'garden', from farmland to balcony planters.

All hemp fiber based horticultural products benefit from the wonderful characteristic of hemp to supplement the nutrients in the soil.

An enrichment for everything that grows!



CROP SUBSTITUTION





CROP SUBSTITUTION THROUGH HEMP



The National Integral Program for the Substitution of Crops of Illicit Use (PNIS) aims to "promote the voluntary substitution of crops of illicit use, through the development of programs and projects to contribute to overcoming the conditions of poverty and marginality of families who derive their subsistence from these crops".

As a viable solution, the cultivation of food and industrial hemp and providing the necessary support to all these growers will have a direct impact on the socio-economic development of our communities.

With this crop, the use of broad-spectrum herbicides would be eradicated, thus improving the health of our coterráneos.

According to the latest UNODC report of July 2022, illegal crop plantations have had an increase of 26% in our regions.

[El_InformeMundialSobreLasDrogas2022_UNODC.pdf](#)



FOOD SAFETY





MITIGATION OF FOOD INSECURITY THROUGH FOOD HEMP

According to the Humanitarian Needs Overview 2023, 7.3 million Colombians are food insecure and will need food assistance in 2023.

RECOMMENDATIONS TO MITIGATE HUNGER IN COLOMBIA ACCORDING TO FAO

- Provide essential agricultural inputs for animal survival and maintenance of crop production.
- Provide technical assistance for the production and conservation of animal feed (silage, hay and artisanal concentrate), the preparation of fertilizers with local inputs and the establishment of seed banks.
- Cash transfers to the most vulnerable people in rural and urban areas to mitigate the impact of expected increases in food prices.
- Support Venezuelan migrants and host communities in bordering rural areas by rehabilitating water systems, establishing areas for rapid food production and supporting rapid fodder production (fodder banks, protein banks and live fences).

[ColombiaEnRiesgoDeHambreAguda_2022:Informe_FAO.pdf](#)



COLOMBIA AT RISK OF ACUTE HUNGER IN 2023

The Recommended Daily Intake is 0.8 grams per kilogram of weight, which means between 56 and 90 grams per day for a man of average weight and little physical activity and 46 to 75 grams for a woman with the same conditions.

Proportional context of our nutritional hemp; a portion (2.5 tablespoons) contains 10 grams of proteins (of vegetable origin), 10 grams of omega 3 and 6 fats and 3 grams of carbohydrates.



We demonstrate a feasible and sustainable solution to make food hemp a crop of national interest



[Resultados_T2022-70.pdf](#)



HEMP MICROGREENS FOOD SECURITY

FIRST DAY SOWING



DATE: NOVEMBER 4, 2022
EXPERIMENT
TROPICAL ATLANTIC 008
RESOL ICA 115096

1. They have 6 trays; each of the trays has 50 alveoli filled with substrate
2. 5 1.5cm holes are made per alveolus, giving a total of 250 holes per tray
3. An irrigation of 1L per tray is carried out
4. They are transported to the field area

SECOND DAY POST SOWING



DATE: NOVEMBER 5, 2022
EXPERIMENT
TROPICAL ATLANTIC 008
RESOL ICA 115096
TIME: 8:10 AM

1. They are in the field
2. No germination yet

THIRD DAY POST SOWING



DATE: NOVEMBER 6, 2022
EXPERIMENT
TROPICAL ATLANTIC 008
RESOL ICA 115096
TIME: 9:50 AM

1. They are in the field
2. No germination yet

FOURTH DAY POST SOWING



DATE: NOVEMBER 7, 2022
EXPERIMENT
TROPICAL ATLANTIC 008
RESOL ICA 115096
TIME: 7:20 AM

1. They are in the field
2. Germination of 5 to 8 seedlings per tray is present
3. Manual irrigation of 1L per tray is carried out

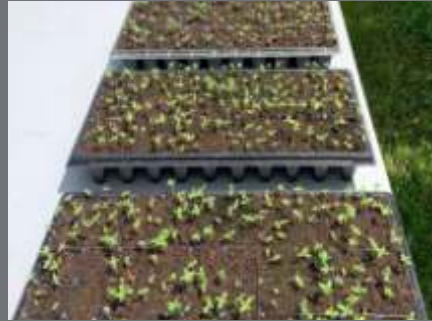
FIFTH DAY POST SOWING



DATE: NOVEMBER 8, 2022
EXPERIMENT
TROPICAL ATLANTIC 008
RESOL ICA 115096
TIME: 7:20 AM

1. hey are in the field
2. Germination of 35 to 50 seedlings is presented for each of the trays

SIXTH DAY POST SOWING



DATE: NOVEMBER 9, 2022
EXPERIMENT
TROPICAL ATLANTIC 008
RESOL ICA 115096
TIME: 10:10 AM

1. They are in the field
2. Germination of 50 to 100 seedlings occurs for each of the trays
3. Manual irrigation of 1L per tray is carried out

SEVENTH DAY POST SOWING



DATE: NOVEMBER 10, 2022
EXPERIMENT
TROPICAL ATLANTIC 008
RESOL ICA 115096
TIME: 8:30 AM

1. They are in the field
2. Germination of 150 to 200 seedlings is presented for each of the trays with a taller stem, larger and greener leaves.

CIAT RESULTS OF THE PROTEIN LEVELS ON THE SEVENTH DAY OF HARVEST



Resolución de la Comisión de Alimentos TROPICAL HEMP

CIAT

Laboratorio de servicios analíticos

RESUMEN DE RESULTADOS

Nombre del Cliente: Tropical Hemp, S de RL
 Referencia: 1000-001
 Procedimiento: 01.Labor - Cannabis

Fecha de Emisión: 2022-11-10
 Fecha de Validación: 2022-11-10

Identificación de la muestra: 1
 Tipo de muestra: Falso Negativo

N	Descripción	Resultado	Unidad
1	Proteína (g/kg) (Método Kjeldahl)	310	g/kg
2	Humedad (g/kg) (Método 105°C/16h)	73.1	g/kg

Nota:
 1. El resultado obtenido en este análisis es válido para el lote de muestra presentado.
 2. El resultado no debe utilizarse para fines de control de calidad.
 3. El cliente debe proporcionar información adicional para la interpretación de los resultados.

Nota:
 1. Este informe es propiedad de CIAT y no debe ser reproducido sin el consentimiento escrito de CIAT.

CIAT Green Building Project
 2022-11-10 10:10 AM
 1000-001-001

Preparación	Análisis
Preparado por: [Firma]	Analizado por: [Firma]
Revisado por: [Firma]	Revisado por: [Firma]

CIAT

RESULTS
Microsprouts with dry root:
 Protein(g/kg): 310
 Humidity(g/kg): 73.1

Dry rootless microsprouts:
 Protein(g/kg): 302
 Humidity(g/kg): 106



Hempo

NUTRITIONAL SUPPLEMENT

ORGANIC - PRECOOKED



INTRODUCTION



Hempo is the nutritional supplement based on hemp seed protofiber, an innovative sustainable nutritional option.

Highlighting extraordinary benefits to maintain a healthy and balanced lifestyle.

We will also explore how hemp is an environmentally friendly option, as its cultivation requires fewer resources and can be produced without harmful pesticides.





WHAT IS HEMP SEED PROTOFIBER?

Hemp seed protofiber is a plant-based protein derived from the hemp plant, a variety cultivated for its nutritional and ecological benefits.

This protein is obtained from hemp seed and is known to be a complete source of essential amino acids, and is also rich in fatty acids such as Omega-3 -6 and -9, known for their positive effects on cardiovascular health. and brain well-being.





BENEFITS OF HEMPO

COMPLETE AMINO ACIDS PROFILE

Hemp protein contains all the essential amino acids the body needs, making it a complete, high-quality protein.



EASY DIGESTION



Hemp protein is easily digestible and well tolerated by many people, including those with food sensitivities or intolerances to other foods.

SOURCE OF POLYUNSATURATED FATTY ACIDS

Hemp is rich in omega -3 and omega -6 fatty acids in a balanced ratio, which is beneficial for cardiovascular health and brain function



SUPPORT OF THE IMMUNE SYSTEM



Hemp protein contains bioactive compounds that may have positive effects on the immune system.

ANTI-INFLAMMATORY PROPERTY

Some studies suggest that certain components of hemp may have anti-inflammatory effects





BENEFITS FOR THE ENVIRONMENT

Hempo is a nutritional supplement that is composed of 66% hemp seed protofiber, a plant that is environmentally friendly since it requires fewer resources to grow and is easily grown without pesticides.

Furthermore, its cultivation is sustainable, since hemp is a fast-growing plant and in its process it absorbs large amounts of carbon dioxide (Co₂), which helps reduce greenhouse gas emissions, contributing to combating climate change.

Hemp is a versatile and sustainable plant that offers significant environmental benefits such as reducing the carbon footprint, conserving natural resources, and promoting more sustainable agricultural practices.





VERSATILITY OF USE

Our hemp seed protofiber-based nutritional supplement is extremely versatile and can be easily incorporated into a daily diet. Add it to smoothies, mix yogurt, sprinkle it on salads or use it in baking recipe ingredients to get a protein boost in your meals.





INSTRUCTIONS FOR USE

Considering that Hempo is a food of high nutritional value and contains proteins, vitamins and minerals, it is necessary to prepare it correctly.

It should be boiled for a maximum period of 5 minutes, to prevent its nutrients from being lost and to promote its use.

It can be prepared in soups, creams, desserts, breads, pastries, cakes, coladas, juices and drinks, among others.





NUTRITIONAL TABLE COMPARISON

TABLA NUTRICIONAL BASADA EN 15g DE PRODUCTO	
SUPLEMENTO NUTRICIONAL A BASE DE CAÑAMO	
TAMAÑO DE PORCION: 1 1/2 CUCHARADAS (15g)	
Proteina	3g
Grasa Polinsaturada	55 mg
Acido A linolenico (Omega 3)	22 mg
Grasa Trans	0
Fibra Dietaria:	3,9g
Azucares:	0,9g
Carbohidratos totales	8g
Porcentaje de vitaminas y minerales diarios basados en una dieta para niños y niñas mayores de seis meses y menores de 4 años de edad	
Proteina	17%
Vitamina A	40%
Vitamina C	20%
Calcio	30%
Hierro	15%
Vitamina B6	50%
Acido Folico	50%
Vitamina B12	50%
Vitamina B1	40%
Vitamina B2	35%
Niacina	35%
Vitamina D	25%
Zinc	50%
Cobre	50%
Fosforo	25%

TABLA NUTRICIONAL BASADA EN 15g DE PRODUCTO	
BIENESTARINA	
TAMAÑO DE PORCION: 1 1/2 CUCHARADAS (15g)	
Proteina	3g
Grasa Polinsaturada	0
Acido A linolenico (Omega 3)	15mg
Grasa Trans	0
Fibra Dietaria:	2g
Azucares:	1g
Carbohidratos totales	10g
Porcentaje de vitaminas y minerales diarios basados en una dieta para niños y niñas mayores de seis meses y menores de 4 años de edad	
Proteina	17%
Vitamina A	40%
Vitamina C	20%
Calcio	30%
Hierro	15%
Bitamina B6	50%
Acido Folico	50%
Vitamina B12	50%
Vitamina B1	40%
Vitamina B2	35%
Niacina	35%
Vitamina D	25%
Zinc	50%
Cobre	50%
Fosforo	25%



HEMP IN COLOMBIA

Socio-economic Stimulus,
Robust sustainable supply

THANK YOU



Let's grow Colombia!