VARIETAL CATALOGUE

PLANT **BREEDING** WRITTEN IN OUR DNA A **MULTI-POTENTIAL** PLANT **INNOVATION,** SECURITY AND ECONOMIC DEVELOPMENT SOCIAL AND ENVIRONMENTAL RESPONSIBILITY







THE R&D MANAGER

HEMP, a breeder and producer of hemp seeds intended for industrial and bio-sourced markets, creates varieties to meet client expectations in France and worldwide.

The existing and emerging hemp markets require varieties with ever-more precise and complex biological and agronomical characteristics to improve.

Research and Development is a strategic element for breederspecific work: helping to anticipate needs and imagining the varieties for the challenges we may face tomorrow.

This is why HEMP-it invests over 10 % of its turnover in varietal innovation and hemp improvement. Investments which were used to create a Research and Development laboratory. This new activity is driven by a dynamic team and will reinforce, accelerate and enhance the varietal creation of hemp. The R&D programs will enable a better understanding of the biology and genetics of hemp, to grasp the transmission mechanisms of the

biological properties to sustainably boost the genetics of the new, agri-food oriented hemp varieties.

This activity ties in with the HEMP-it culture, a cooperative which is run by farmers who are convinced that hemp is a plant of the future, and genuinely wanting to have it promoted, investing in the innovation whilst ensuring coherent progress in response to the user needs.

The concerns of HEMP-it and its farmers-partners are the challenges for the R&D which will be the driving forces of their success.

Fabienne Mathis

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PRESENTATION



HARVESTS THE NUMEROUS HEMP PROSPECTS

POSSIBLE HEMP USAGES: AERONAUTICS, HOUSING, TEXTILES, FOOD, COSMETICS...



PLANT BREEDING WRITTEN IN OUR DNA

All the administrative, business and operational jobs within the structure are run by young employees, with an equal number of men and women, boasting earth-science literacy to guarantee top-level technical proficiency.

An expertise reinforced by valuable industrial equipment and facilities: production site, seed quality laboratory, R&D centre, first-class scientific partnerships and a specialised network of farmer-producers.



MULTI-POTENTIAL PLANT

Hemp has many advantages, notably the fact that the whole plant can be used: Hemp seeds, Shives, and fibres. This particularity provides development possibilities in numerous markets: such as for plastic processes (automobile, aeronautics, household-appliance industry, housing), animal and human foodstuffs (oil, flour, seeds...), cosmetics (body and hair care...), textile, building, agronomy and agriculture (plant used for agri-environmental purposes).



INNOVATION, SECURITY AND ECONOMIC DEVELOPMENT

It handles all the upstream operations related to the innovation and sustainability of the sector through: market monitoring, preservation, selection and varietal innovation, proliferation of G0, G1, G2, approval of genetic work and varieties created for the market, filing PBRs*, advice and assistance from producers, research centres and other sector-specific players as well as worldwide promotion of French hemp which has been preserving bio-diversity since 1973 through its assignment of managing a DNA database.



SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

Hemp has high environmental value characteristics: it needs little water and no pesticides to grow and the whole plant can be used. A strong tie exists between these hemp-specific characteristics and the company culture. The latter ensures the preservation of the environment and health: it protects, coordinates and adapts whilst remaining independent. 5



PREFACE

In the description of varieties presented here, you will find indications regarding the full-flowering date and the growth-cycle duration. Regardless the variety, the full-flowering date depends on the day-length and consequently varies very little, irrespective of the sowing date.

So, the growing-cycle durations indicated correspond to a sowing date on May 10. Earlier sowings can extend the cycle by a week and inversely, the cycle of later sowings can be shortened by a week.

When growing at other latitudes, the production potentials (straw, seeds and fibres) and the growing times vary, but the other criteria remain unchanged.

The seed quality being sold is also presented. The average germination capacity for the past 10 years (considering that the seed certification standard imposes a minimum of 75% of growth) and the average male purity level for the past 10 years (number of males observed for 100 plants) are indicated.

Last but not least, a calendar will remind you of the main cycles for growing at latitudes equal to Le Mans, using the following key:

0 5 10 ●●●●○○○○○○

Potential of straw production (1: very low yield – 10: very high yield)

Potential of fibre production (1: very low yield – 10: very high yield)

Fibre content (1: not fibre-rich – 10: very fibre-rich)

Potential of seed production (1: very low yield – 10: very high yield)

Earliness (1: very early-flowering variety – 10: late-flowering variety)

TKW (thousand kernel weight) (1: very small seeds - 10: very large seeds)

THC level (1: no THC – 10: 0.2% THC)

CBD level

(1: no CBD – 10: very rich in CBD)

Lodging sensitive (1: no lodging – 10: very lodging-sensitive)

sowing possible growth

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ageing

harvest possible

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STRAW ORIENTED VARIETIES

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PREMIUM VARIETIES

FIBRE

ORIENTED VARIETIES

26S	anthica 27
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SEED ORIENTED VARIETIES

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APPLICATIONS IN ALL FIELDS

01 - BUILDING & CONSTRUCTION 02 - RAILWAY INDUSTRY 03 - FOOD-PROCESSING INDUSTRY 04 - AUTOMOBILE INDUSTRY 05 - FASHION 06 - GASTRONOMY 07 - NUTRITION 08 - PERSONAL CARE PRODUCTS

THEY BELIEVE IN US



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FOOD

Hemp seeds have nutritional properties which are still unknown by consumers. To better inform the general public, brands like Sojade, have developed desserts which naturally contain omega 3 and have little saturated fats.

THE AUTOMOBILE INDUSTRY

It uses reinforced hemp-fibre composite materials for dashboards catering to major French or foreign manufacturers. Lighter than plastics made from petrol, and with the equivalent technical abilities, these bio-sourced plastics have two ecological advantages : a recyclable product and less CO2 emissions.

FASHION

Hemp Eyewear innovates by marketing the first glasses in hemp fibres.

Manufactured in Edinburgh, Scotland, these frames can be recycled and are more resistant and light than those made with carbon fibres.







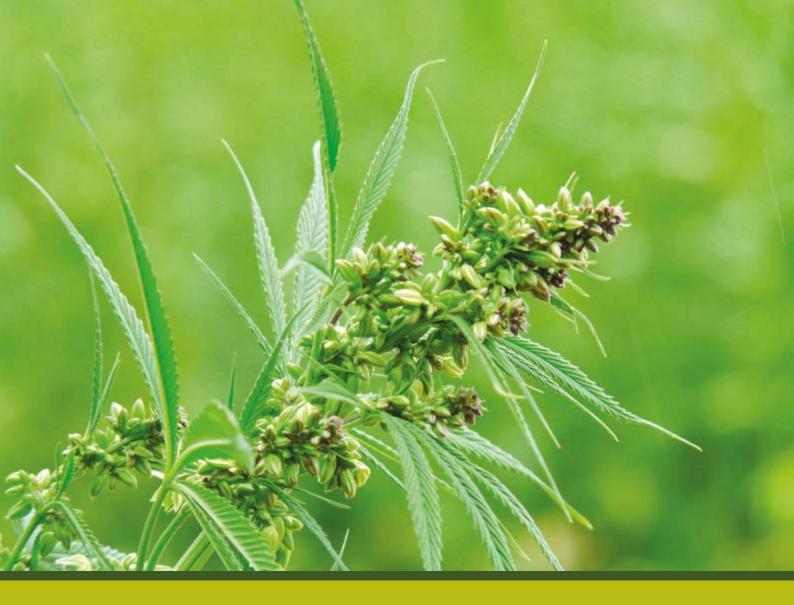






COSMETICS

Today there are numerous dermatological product ranges with properties allowing to moisturise, reduce redness associated with eczema and psoriasis. These organic products are made using pure essential oils which contain absolutely zero chemical products.



INDUSTRIAL VARIETIES

IDEAL FOR MANY USAGES

Thanks to their plasticity and hardiness, industrial varieties were chosen as very versatile and therefore suitable for various usage types depending on the latitude at which they are grown:

Solely the straw market (unthreshed crop) for more northern latitudes,

Mixed market of straw + seeds (threshed crop) for intermediate latitudes,

Solely seeds market for southern latitudes.

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SEED OR MIXED-ORIENTED VARIETIES

A REASSURING CHOICE FOR TWO-FOLD ECONOMIC ENHANCEMENT

You can find here all the varieties which can be farmed for seed production (threshed crop).

INDUSTRIAL VARIETIES

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SEED OR MIXED ORIENTED VARIETIES

12	
13	
14	
15	Félina 32

INDUSTRIAL VARIETIES

SEED OR MIXED ORIENTED VARIETIES

USO 31

MONOECIOUS

CYCLE DURATION: 122 to 127 days



Seed quality

Germination capacity (average over 10 years): 86.6%

Male purity rate (average over 10 years): 0.26%

Varietal characteristics

Type: Monoecious

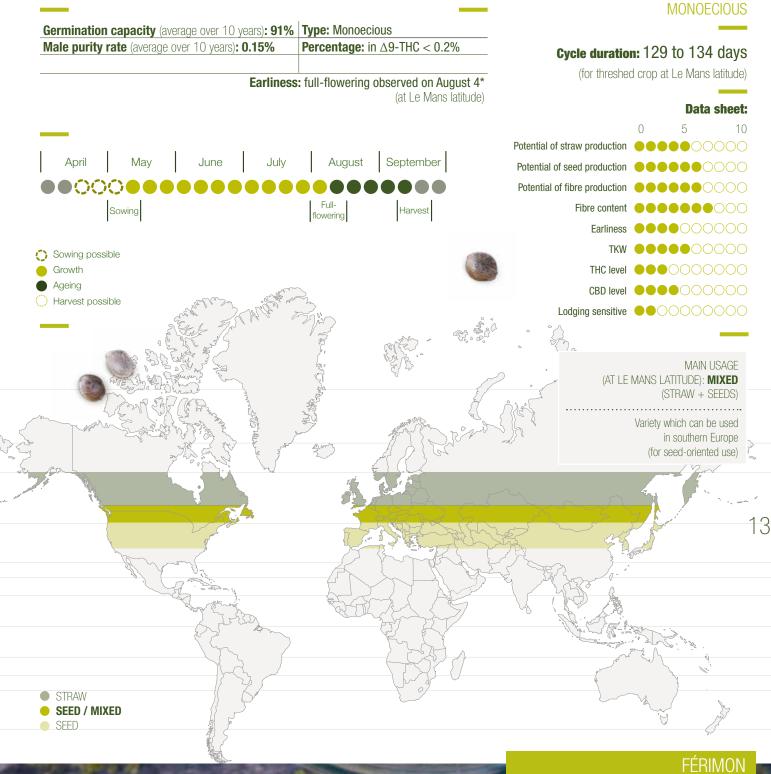
Fibre: Rich



FÉRIMON

Varietal characteristics

Seed quality



INDUSTRIAL VARIETIES

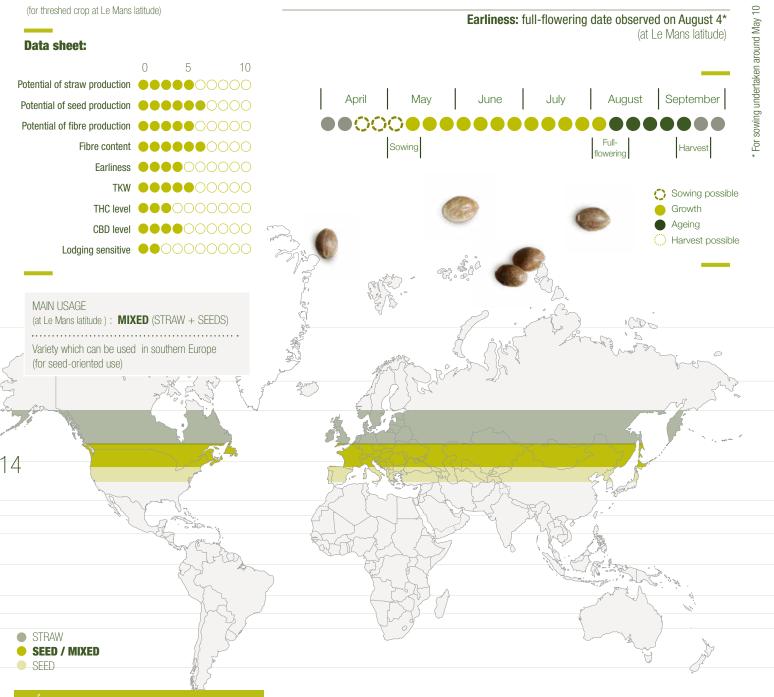
SEED OR MIXED ORIENTED VARIETIES

MANNEC

FÉDORA 17

MONOECIOUS

Cycle duration: 129 to 134 days



Seed quality

Germination capacity (average over 10 years): 91.8% Type: Monoecious

Male purity rate (average over 10 years): 1.74%

Varietal characteristics

Percentage: in \triangle 9-THC < 0.2%

INDUSTRIAL VARIETIES

SEED OR MIXED ORIENTED VARIETIES

-élina 32

Varietal characteristics

Seed quality

MONOECIOUS Germination capacity (average over 10 years): 91.5% Type: Monoecious Male purity rate (average over 10 years): 0.17% **Percentage:** in \triangle 9-THC < 0.2% Cycle duration: 133 to 138 days (threshed crop, at Le Mans latitude) Average earliness: full-flowering date observed August 8* (at Le Mans latitude) **Data Sheet:** 0 5 10 Potential of straw production April June July August September May Potential of seed production Potential of fibre production Full-flowering Sowing Harvest Fibre content Earliness 0000000 000000 TKW Sowing possible Growth THC level •••0000000 Ageing CBD level Harvest possible Lodging sensitive MAIN USAGE (AT LE MANS LATITUDE): MIXED (STRAW + SEEDS)) Variety which can be used in southern Europe (for seed-oriented use) 15 STRAW SEEDS / MIXED SEED FÉLINA 32

SUMMARY

OF INDUSTRIAL

SEED OR MIXED ORIENTED VARIETIES

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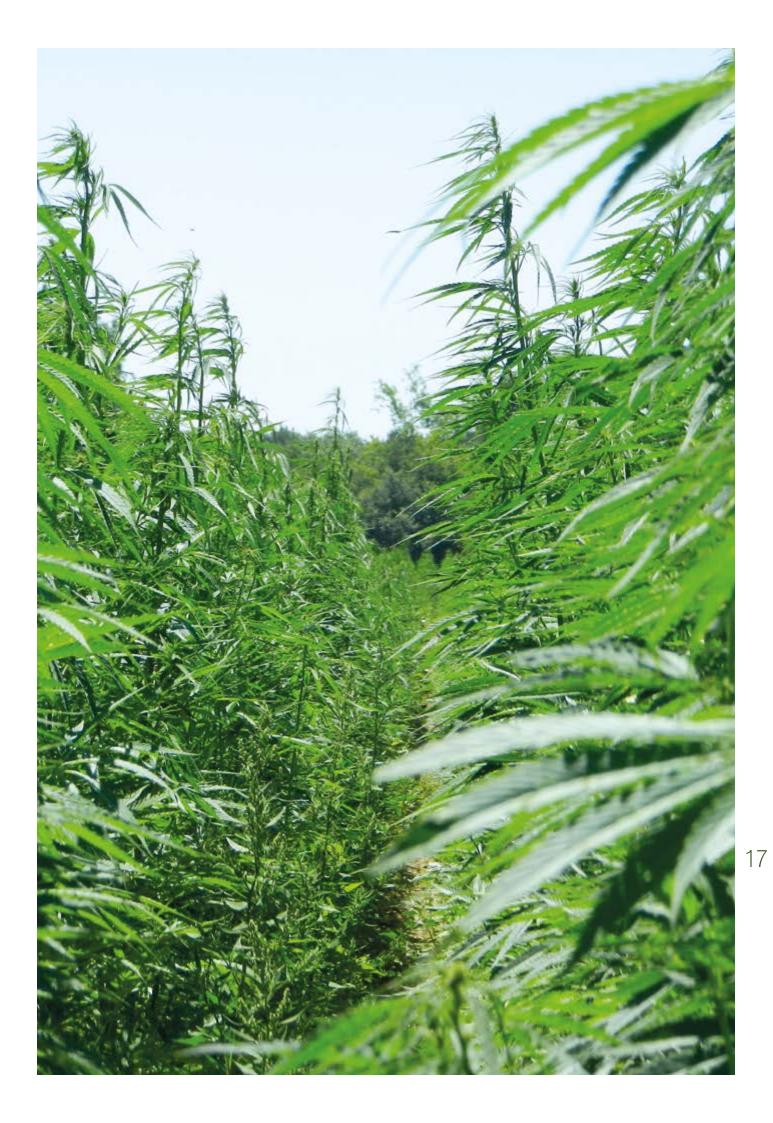
		FÉLINA 32			FÉRIMON	l -		FÉDORA	17		USO 31	
	0	5	10	0	5	10	0	5	10	0	5	10
Potential of straw production			0000			0000			0000			000
Potential of seed production			0000			0000			0000			000
Potential of fibre production			0000			000			0000			000
Fibre content			0000			000			0000			000
Earliness			0000			0000			0000		0000	000
TKW			0000			0000			0000			000
THC level		0000	0000			0000		000	0000			000
CBD level		000	0000			0000			0000			000
Lodging sensitive					0000			0000	0000		0000	
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MAIN USAGE (at Le Mans latitude):

MIXED (STRAW + SEEDS) MIXED (STRAW + SEEDS) MIXED (STRAW + SEEDS)

SEEDS





STRAW ORIENTED VARIETIES

THE APPROPRIATE CHOICE FOR BIOMASS PRODUCTION

Here, you'll find all the varieties which can be grown for producing straw (unthreshed crop harvesting).

INDUSTRIAL VARIETIES



19	Futura	75
20		

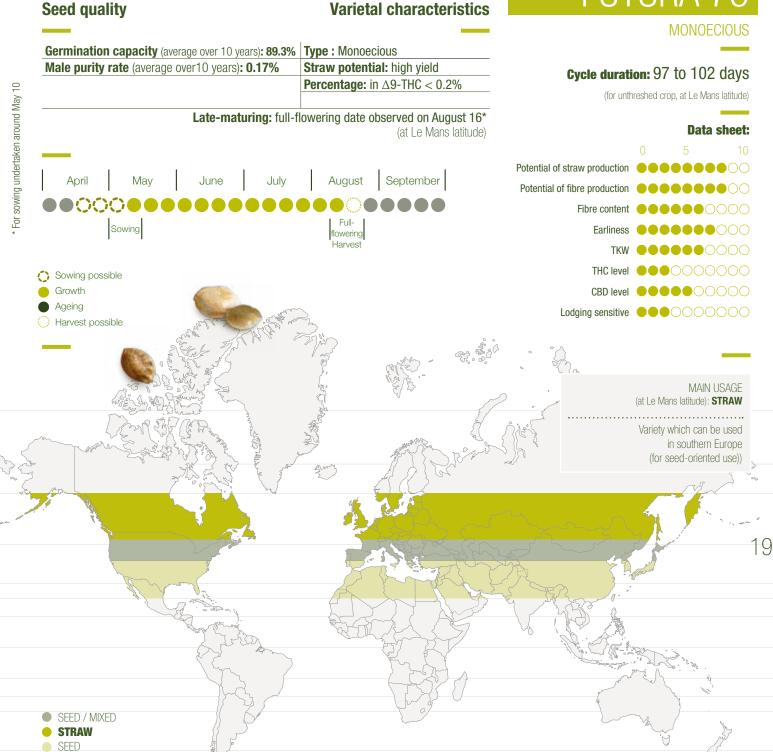
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INDUSTRIAL VARIETIES

SEED OR MIXED ORIENTED VARIETIES

FUTURA 75



FUTURA 75

INDUSTRIAL VARIETIES

STRAW ORIENTED VARIETIES

DIOÏCA 88

DIOECIOUS

Seed quality

Seed quality



For sowing undertaken around May 10

SUMMARY

INDUSTRIAL VARIETIES



STRAW ORIENTED

		FUTURA 7	5
	0	5	10
Potential of straw production			
Potential of fibre production			
Fibre content			0000
Earliness			000
TKW			0000
THC level		0000	0000
CBD level			0000
Lodging sensitive		0000	0000

Potential of straw production	•••••
Potential of fibre production	•••••
Fibre content	$\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\circ$
Earliness	•••••
TKW	$\bullet\bullet\bullet\bullet\bullet\bullet\bullet\bullet\circ\circ\circ$
THC level	•••0000000
CBD level	•••••
Lodging sensitive	••••000000



MAIN USAGE (at Le Mans latitude): **STRAW**



DIOÏCA 88

STRAW

SEED, STRAW AND MIXED ORIENTED VARIETIES

WORLDWIDE USAGE

HEMP-IT VARIETIES EXPORTED.

Hemp plasticity generates diverse possible answers depending on the environment, climate and latitude.

H≡MP varieties have not yet been tested worldwide but if you wish to farm them in a new area, we can assist you to implement varietal trials to thus more accurately estimate their behaviour in your environment. For example, some of our Canadian clients ● use the FÉRIMON and USO 31 varieties for seed production In New Zealand , it's also the Ferimon variety which is mostly farmed to produce hemp seeds. The cycle durations are fairly close to what has been observed in France, but the cycles are undertaken out-of-season (sowing during the month of November to be harvested in March).

In some areas, thanks to the climate and favourable photoperiod, it is possible to do several cycles in a year.

Indeed, in Queensland, Australia , FUTURA 75 can be farmed for the production of hemp seeds, and it's possible to undertake 2 or even 3 cycles throughout the year outside. This same pattern was observed in Malawi .





OUR PRODUCERS

The $\bowtie \square Pi d$ cooperative production area has always been for producing hemp. Its proximity with the Loire and its river-borne deposit make this a perfect region for producing hemp.

It's therefore quite natural that the production of hemp develops in this area which is very focused on producing specialised crops (notably seeds). The demanding and technical nature of our producers make them autonomous for roguing, allowing not only to harvest the amount requested, but also to provide outstanding seeds.

SOME FIGURES:

- Production surface area in 2018: 1500 hectares
- 130 cooperative producers
- Over 10 hectares of hemps seeds per farm.
- 200 seasonal workers trained for roguing throughout the whole area.
- 13 specially-designed hemp combine harvesters for 2 months.
- Area-specific harvesting and drying capacity: 100 tons/day.





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PREMIUM VARIETIES

IDEAL FOR PROCESSING MANUFACTURERS

Premium varieties are chosen to meet very specific uses and their full potential is only revealed if given very special attention. In order to fully benefit from the high variety-specific standards when growing, we urge you to closely follow our farming recommendations.

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PREMIUM VARIETIES

FIBRE OR SEED ORIENTED

Here, you'll find all the varieties which can be grown for producing fibre (unthreshed crop harvesting) or for producing seeds (threshed crop).

PREMIUM VARIETIES

FIBRE ORIENTED VARIETIES

26	Santhica 27
27	Santhica 70
28	Fibror 79

PREMIUM VARIETIES

Earlina 8 fC

SEED ORIENTED VARIETIES

PREMIUM VARIETIES

FIBRE **ORIENTED VARIETIES**

SANTHICA 27

MONOECIOUS

Cycle duration: 90 to 95 days



Seed quality

Germination capacity (average over 10 years): 89.6%

Varietal characteristics

Type: monoecious Percentage: THC 0%



Varietal characteristics

Type: Monoecious

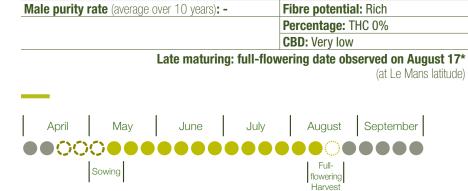
PREMIUM VARIETIES

FIBRE ORIENTED VARIETIES

SANTHICA 70

MONOECIOUS

Seed quality



Germination capacity (average over 10 years): -

(unthreshed crop, at Le Mans latitude) **Data sheet:**

Cycle duration: 97 to 102 days

	0	5	10
Potential of straw production			••••
Potential of fibre production			
Fibre content			
Earliness			000
TKW			0000
THC level	000	0000	0000
CBD level	O OC	0000	0000
Lodging sensitive	•••		0000

FARMING **RECOMMENDATIONS:**

Sowing possible Growth Ageing Harvest possible

> To get the best out of this fibre-rich content variety, it is recommended to not sow at a density less than 60kg/ha (which is around 3,500,000 and 4,000,000 plants/hectare). For optimal fibre quality, we recommend a harvest between the full-flowering and end-flowering phases (less secondary fibre).

MAIN USAGE: FIBRE. Variety which can be adapted for use in southern Europe (for fibre-oriented use).



SANTHICA 70

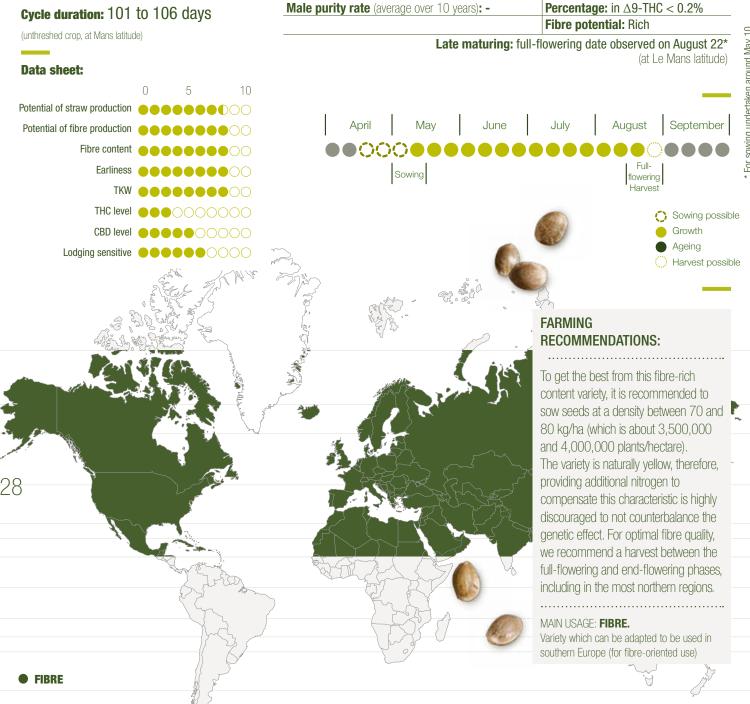
PREMIUM VARIETIES

FIBRE **ORIENTED VARIETIES**

FIBROR 79

MONOECIOUS

Cycle duration: 101 to 106 days



Seed quality

Germination capacity (average over 10 years): -

Varietal characteristics

Type: Monoecious

For sowing undertaken around May 10

FIBROR 79

NEW IN 2019

PREMIUM VARIETIES

SEED ORIENTED VARIETIES

EARLINA 8 FC

Varietal characteristics

Seed quality

* For sowing undertaken around May 10

Seed quality	varietai characteristic	_					
Germination capacity (average over10 years): -	- Type : Monoecious	MONOECIOUS					
Male purity rate (average over 10 years): -	Percentage: in \triangle 9-THC < 0.2%	Acres describes the 11E to 100 down					
		Cycle duration*: 115 to 120 days					
Very-early maturing:	full-flowering date observed on July 20						
	(at Le Mans latitude	Data sheet:					
_		0 5 10					
		Potential of straw production					
April May June J	uly August September	Potential of fibre production					
		Fibre content					
Sowing	Full- flowering Harvest						
Sowing possible		THC level					
Growth		CBD level					
Ageing Harvest possible		Lodging sensitive					
FARMING RECOMMENDATIONS:							
Fo facilitate the seed yield expression of this variety, it is high density. This can be between 25 and 30 kg/ha (which is about 2,000,000 and 2,500,000 plants/hectare).							
MAIN USAGE:							
(Gr	2 Fredda	and the second s					

• SEED

SUMMARY

OF PREMIUM VARIETIES



SEED AND FIBRE ORIENTED VARIETIES

		Santhica	27		SANTHICA	70	FIBROR 79		FIBROR 79		'9			earlina	8FC
	0	5	10	0	5	10	0	5	10		0	5	10		
Potential of straw production			0000							Potential of straw production	••C	0000	0000		
Potential of fibre production										Potential of seed production					
Fibre content										Potential of fibre production		000	0000		
Earliness			0000			000				Fibre content			0000		
TKW		0000	0000			0000				Earliness	•00	000	0000		
THC level	000	0000	0000	000	0000	0000		0000	0000	TKW		000	0000		
CBD level	000		0000		0000	0000			0000	THC level		000	0000		
Lodging sensitive			0000			0000			0000	CBD level			0000		
										Lodging sensitive	•OC	000	0000		









MAIN USAGE :

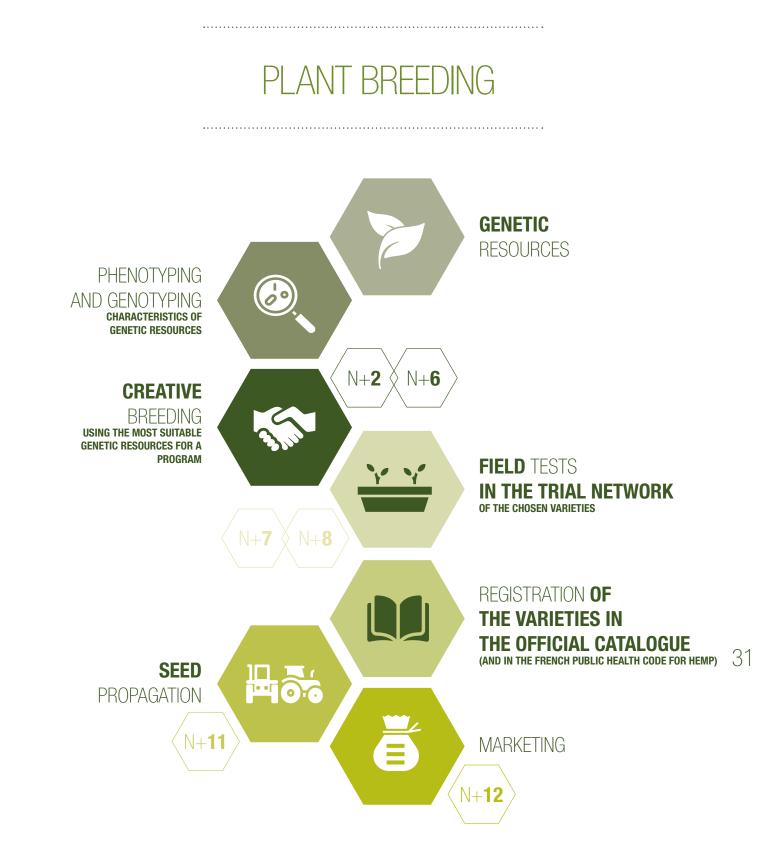
FIBRES

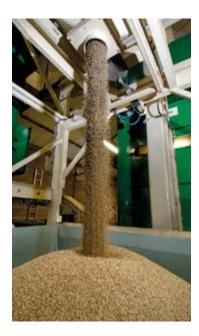
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FIBRES

FIBRES

SEEDS











AN INDUSTRIAL PRODUCTION SITE

A COOPERATIVE BOASTING EFFICIENT INDUSTRIAL EQUIPMENT



Drying

- Revolving straw remover
- Sorting using a cleaner-separator
- Sorting using a densimetric table
- Storage in cold room
- Seed analysis
- Shipping

The production site is **nearly 8000m²** and equipped with a set of specific machines allowing the smooth running of each production step and guaranteeing volumes and short deadlines







THE SEED PRODUCTION FACILITY

HAS RECENTLY BEEN EQUIPPED WITH AN INTERNAL SEED ANALYSIS LABORATORY

In our endeavour to constantly improve our seeds, we wanted to **develop** the skills of our agents to directly analyse our producer-specific batches on our site.

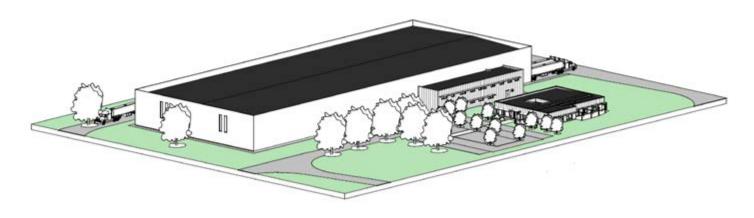
These analyses allow us to manage the production facility, providing a unparalleled quality in the supply of hemp crops on an international level.

With this expertise we can now be diligent regarding the following analyses:

- Batch approvals using micro-cleaning
- Germination capacity
- Purity, enumeration

There are thus over 600 batches which are analysed every year in our laboratory.





OUR VISION FOR HEMP-IT 2021

Highly-aware of the social and environmental concerns of tomorrow, the **HEMP** cooperative wanted to lead the way.

We would [']like to participate in promoting bio-sourced hemp construction and to have our employees, clients and farmers be the first beneficiaries. We have decided to invest in a modern, welcoming area where it will make working-together lots of fun. A cheerful place to consolidate our collective intelligence, pool our means, develop future talents and imagine a hempfilled future!

We have entrusted this assignment to $C \land N$, a Nantes-based engineering firm using bio-sourced materials, which knows how to most appropriately use hemp to further our development.

Yes, we $C \land N \dots$ so just $H \equiv MP \not \downarrow !!!$



Bio-sourced materials decrease the environmental impact of construction and guarantee excellent sanitary and thermal quality for users. These are renewable materials which, for the most part, represent genuine carbon absorbers, contributing to keeping our planet in balance.





$-C \land N$

Thanks to the double-competence of engineers and architects (leading Civil Engineering School and the Paris La Villette School of Architecture), and to various experiences in the field of construction using bio-sourced materials, $C \land N$ aims to promote responsible, fully-mastered building, through the various projects it undertakes.



www.hemp-it.coop



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SEMENCES	
MADE IN	
FRANCE	

SEED OFFERS MADE IN FRANCE ADAPTED TO THE WORLD

