



FT-NIR the portable revolution





Total THC	+	THCa	+
Total CBD	+	CBDa	+
Total CBG	+	Total (%) Terpenes	+
NEW Water Activity	+	NEW % Moisture	+



B - Myrcene	+	Linalool	+
Limonene	+	A - Humulene	+
B - Caryophyllene	+	Terpinolene	+
A-Pinene	+	G - Elemene	+
B-Pinene	+	Eudesma - 3,7 (II)	+

Macro-nutrients

% N	+	% K	+
% P	+	% Ca	+
% Mg	+		

Micro-nutrients

ppm Fe	+	ppm Mn	+
ppm B	+		



VALENVERAS



NeoSpectra

Ruben Valenzuela Moreno

- ▶ Agriculture Engineer (UPC) Barcelona
- ▶ Industrial Engineer (UPC) Barcelona
- ▶ Industrial designer (Hanzehogeschool Groningen)
- ▶ Master in genomics and advanced genetics. (UAB)
- ▶ Co-funder CTO Valenveras and Cannaveras Genetics
- ▶ Co-Founder Cannabis Hub Europe
- ▶ Technical advisor to several companies in the cannabis sector



CANNAVERAS

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BIOBIZZ
WORLD WIDE ORGANICS



cannabishub
INNOVATION & KNOWLEDGE TO SHARE



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European Grant Triumph: €500K Accelerates Pioneering Research



Generalitat de Catalunya
**Departament d'Agricultura,
Ramaderia, Pesca i Alimentació**



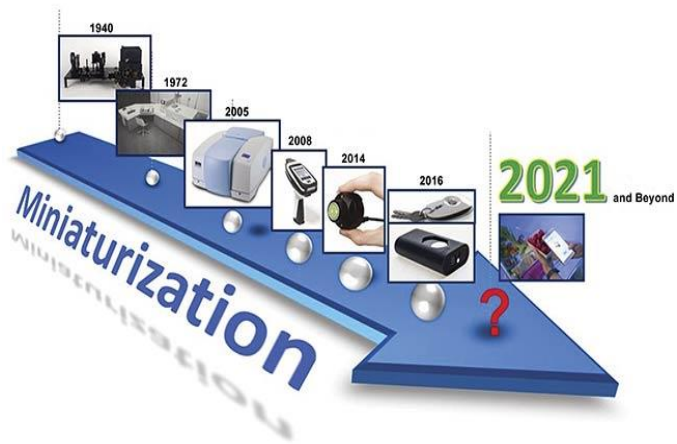
**Fons Europeu Agrícola
de Desenvolupament Rural:**
Europa inverteix en les zones rurals

Cooperació per a la innovació: Grups Operatius

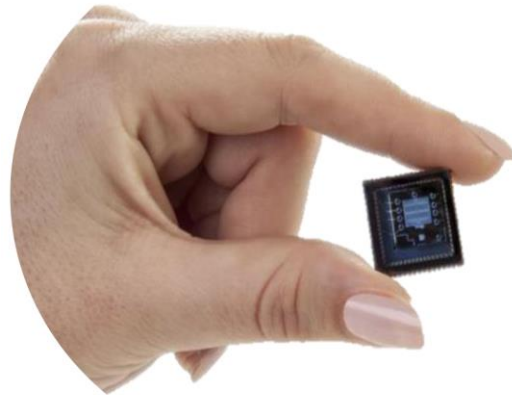
Fitxa inicial del projecte

Estratègies de millora del rendiment i valorització del producte derivat del cultiu de
cànnem industrial



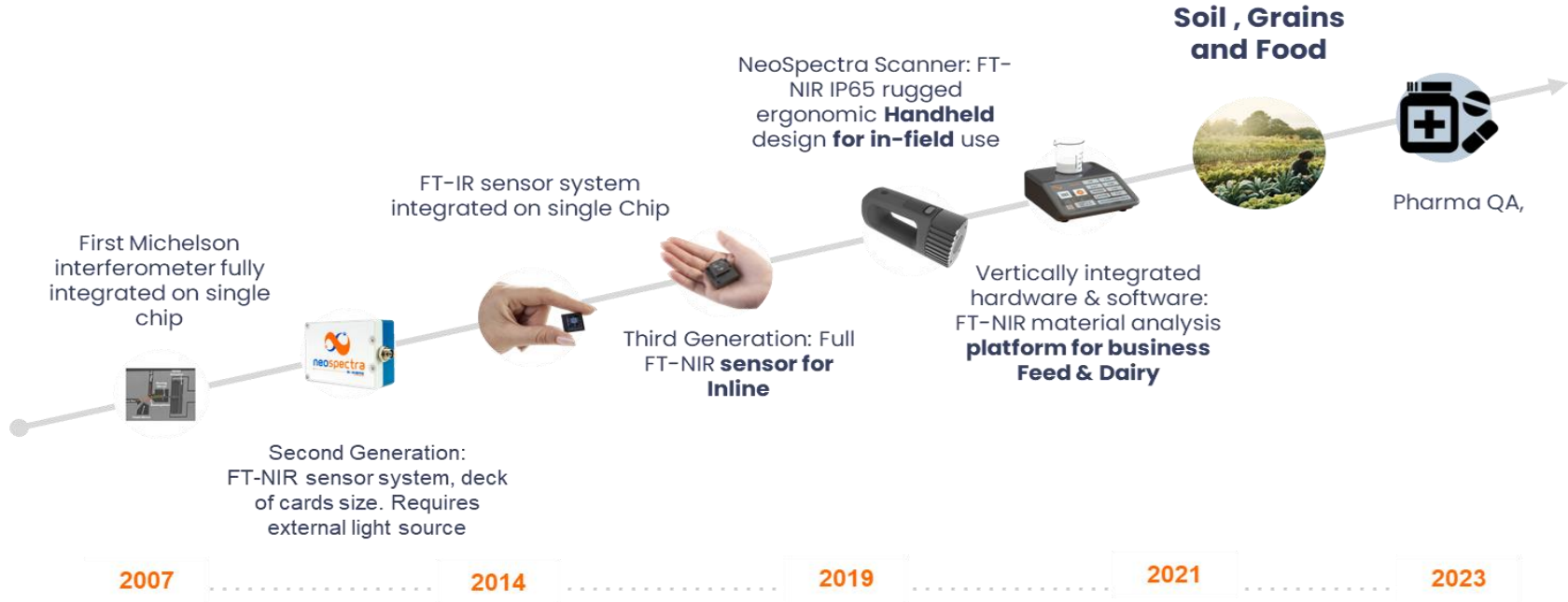


Why NIR talk today?



Si-ware Current Solution:

Innovation Timeline



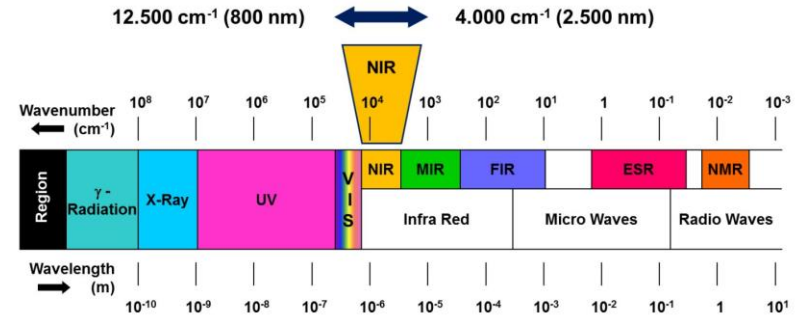
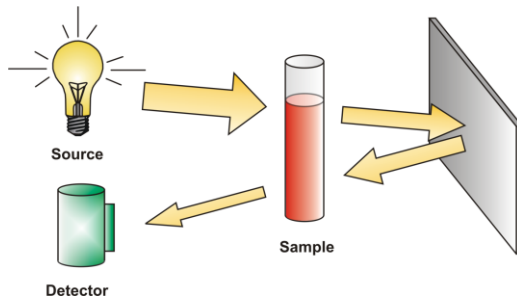
VALENVERAS



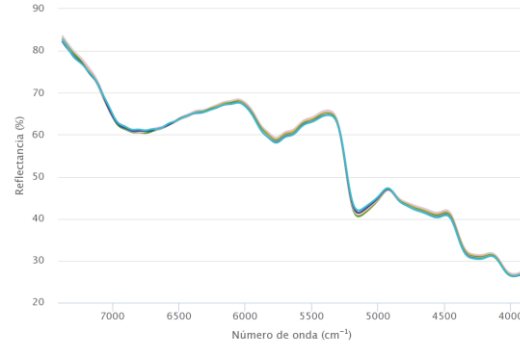
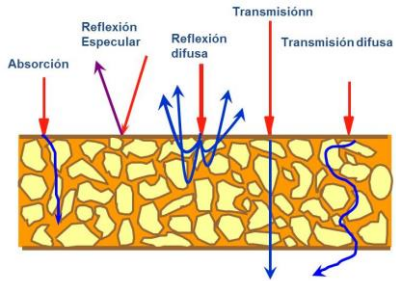
NeoSpectra

¿What is NIR?

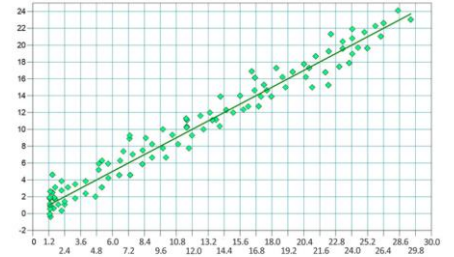
Analytical technique of using near-infrared radiation to analyse light absorbance.



¿How it Works?



Prediction vs True / THCA [%] / 1-30



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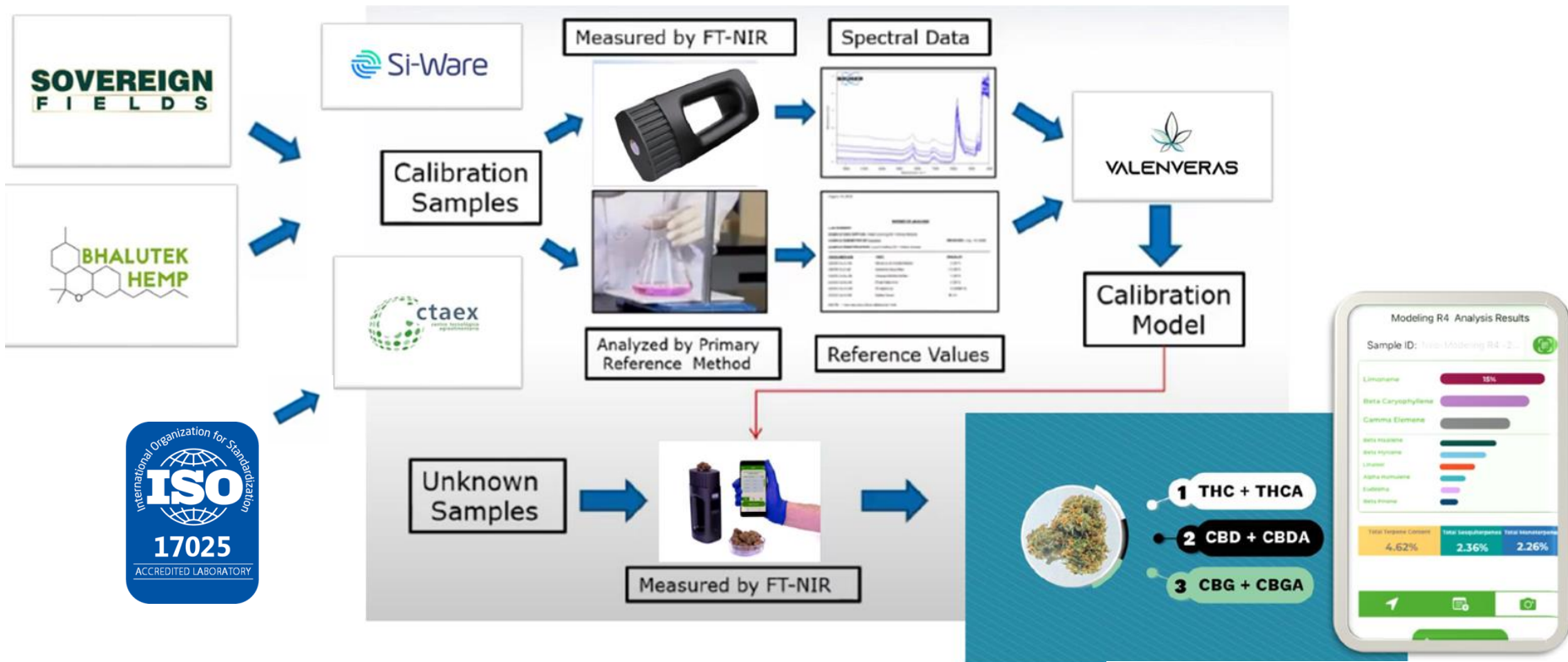
Sharing is Caring



**SOVEREIGN
FIELDS**



Valenveras Cannabis models – Offering



Main features



More Range and accuracy

Measuring range of 1350-2500 Nm, so it can measure with more precision with a finest resolution



Mobile, instant and cheap analysis

Obtain anywhere accurate measurements in real time, quickly and economically



VALENVERAS

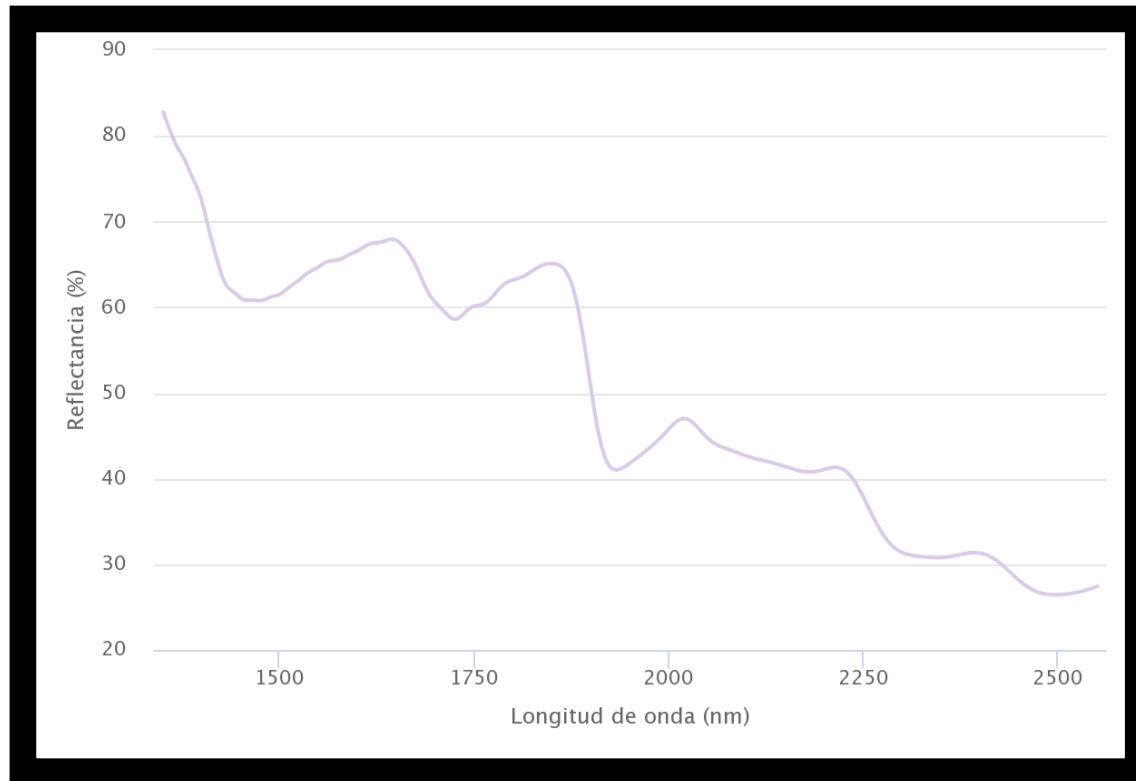


NeoSpectra



More Range and accuracy

Measuring range of 1350-2500 Nm, so it can measure with more precision with a finest resolution





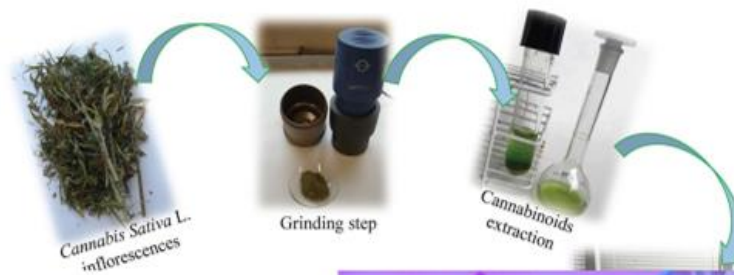
Non-destructive

Do not damage or destroy your samples, saving money and product by reusing it



Reagents free (Eco-friendly)

Does not require harmful chemical reagents being environmentally friendly





NO maintenance

Designed to be low maintenance, our equipment will give you accurate measurements for years. Built with strong materials





Without Qualified Personnel

Easy to use and does not require specialized personnel for its operation





Multiple Uses (Realtime process)

Equipment Designed for more materials and substances than cannabis flowers, like ground, seeds, liquids, etc.





Periodically upgraded

We make sure to keep our device updated with the latest algorithms and models to provide you with accurate measurements at all times



CUSTOMER DASHBOARD:

NeoSpectra™

Ruben Valenzuela
Ruben Valenzuela Moreno

Escaneos

Regreso

Filtros aplicados

MATERIAL
Cannabis Analysis by Valenveras

Escanea datos

Datos Espectros Histograma

Sincronización (0) Opciones Spectra Opciones | 1 Exportar

Sample Name	Moisture (%)	THC Total (%)	THC_Total_Global (%)	THC_Total_High (%)
vt3 (i) bottom 2/2	11.47	13.22	13.5	13.22
vt3 (i) bottom 2/1	11.71	14.21	14.2	14.21
vt3 (i) bottom 1/2	10.7	12.16	13	12.16
vt3 (i) bottom 1/1	11.09	11.52	12.6	11.52
vt3 (i) top 2/2	11.4	14.82	15	14.82
vt3 (i) top2/1	11.57	17.1	17	17.1
vt3 (i) top 1/2	10.74	12.6	13.8	12.6
vt3 (i) top 1/1	11.29	14.38	14.9	14.38
vt3 (i) bottom2/2	11.46	15.76	16.3	15.76
vt3 (i) bottom 2/1	11.35	14.09	14.3	14.09
vt3 (i) bottom 1/2	11.1	13.96	14.9	13.96
vt3 (i) bottom 1/1	11.09	13.99	14.7	13.99
vt3 1 top 2/2	10.86	13.99	14.5	13.99
vt31 top2/1	11.25	15.18	15.6	15.18

Servicio de asistencia

NeoSpectra™

Ruben Moreno
NeoSpectra Sales Latam

Escanea datos

Datos Espectros Histograma

Sincronización (0) Opciones Spectra Opciones | 1 Exportar

Escaneos Detalles

NOMBRE DE LA MUESTRA
NeoSpectra-Cannabis Analysis by Valenveras-2023-04-28_21250

Predicted Edit

NOMBRE DEL PARÁMETRO	VALOR PREDICADO	VALOR DE REFERENCIA	VERSIÓN
THC Total (%)	16.7	0	V5.0
CBDa (%)	0.2	0	V5.0
CBD Total (%)	0.3	0	V5.0
Total Terpenes (%)	0.8	0	V5.0
Limonene (%)	0.2	0	V4.1
B-Caryophyllene (%)	0.5	0	V4.1
G-terpene (%)	Invalido	0	V4.1
B-Mircene (%)	0.1	0	V4.1

Consultar

Servicio de asistencia

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Idioma English Português Español Contact



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Terpenes & Cannabinoids Portable Lab

Discover a new way to analyze cannabinoids and terpenes with our portable NIR technology scanner.



POWER BY
NeoSpectra™
by SiWare

Quality analysis in the palm of your hand

Analyze samples of dried and ground cannabis flower. The device comes with all necessary accessories and tools to analyze samples on the go.

Total THC

THCa

Total CBD

CBDa

Total CBG

Total (%) Terpenes

NEW
Water Activity

NEW
% Moisture



New terpene analysis

Get accurate and cost-effective measurements in seconds, allowing you to make fast and precise decisions to improve your business on the spot.

B - Myrcene

Linalool

Limonene

A - Humulene

B - Caryophyllene

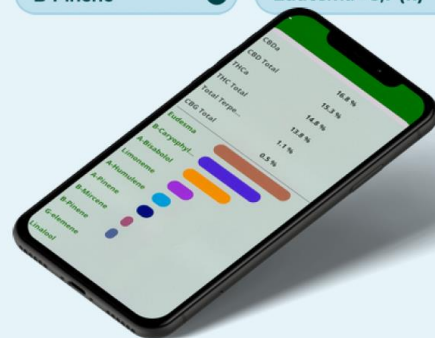
Terpinolene

A-Pinene

G - Elemene

B-Pinene

Eudesma - 3,7 (11)



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New terpene analysis

Get accurate and cost-effective measurements in seconds, allowing you to make fast and precise decisions to improve your business on the spot.

B - Myrcene

Linalool

Limonene

A - Humulene

B - Caryophyllene

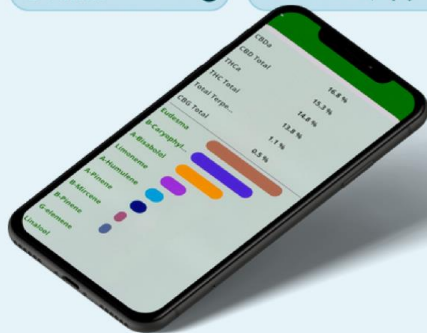
Terpinolene

A-Pinene

G - Elemene

B-Pinene

Eudesma - 3,7 (11)



Download on the
App Store



GET IT ON
Google Play

Easy Operation

1 

Download and connect your scanner to the app

2 

Place your sample and start the measurement

3 

View the results on your mobile phone

Where to buy



(+66) 61 858 9249 (Thatchaphon)

(+66) 80 938 6388 (Supawadee)



info@saengvithscience.co.th

Terpenes & Cannabinoids Portable Lab

Discover a new way to analyze cannabinoids and terpenes with our portable NIR technology scanner.



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by Si-Ware



Saengvith Science Co., Ltd.

www.saengvithscience.co.th

Uses of portable FT-NIR to determine cannabinoids and terpenes in dry-cured cannabis flowers



Marcel Plans¹; Adham Hesham¹; Ruben Valenzuela²

¹. Si-Ware Inc. 101 Jefferson Drive, Menlo Park, CA, USA. ². Valenveras, Camí Pla de la Torreta 1 BIS, Sant Andreu de Llavaneres, 08392, Barcelona, Spain

INTRODUCTION

The cannabis industry is growing exponentially worldwide. The crop can engage old and new farmers to adopt it as a novel crop. In that sense, there is a need for fast, on-site, accurate technology to provide the growers, distributors, and producers with a tool to manage the quality control of their sites and improve crop optimization. NIR infrared has shown the potential to be used as a tool to predict the cannabinoids content in dry-cured flowers hemp (1) and cannabis (2).

Handheld portable devices provide good performance to predict quantitative levels of cannabinoids in flowers (2). This has opened a lot of opportunities to implement this technology in the field and directly to the quality control; from the crop to the distributor to the medical dispensary. Increasing the traceability of the production and improving the transparency for the final user.

METHODOLOGY

A Total of 7000 samples were used to calibrate the cannabinoids, and 4000 samples to calibrate the total terpenes. The reference analyses were done using ISO certified HPLC-PDA method for cannabinoids and GC-FID for the total terpenes.

Partial Least Square regression (PLSR) was used to correlate the spectra obtained from NeoSpectra Scanners (17 scanners (Si-Ware Inc., Menlo Park, CA, USA)) from 1350 – 2550 nm with the reference analysis.

RESULTS

Models showed a good performance predicting THC, CBD, CBG, Total Terpenes, THC acid, and CBD acid with a low error of predictions.

	Low Concentration 0-3%				High Concentration 3-30%			
	RMSECV	R ² _{cv}	RMSEP	R ² _p	RMSECV	R ² _{cv}	RMSEP	R ² _p
CBD Total	0.19	0.80	0.16	0.91	1.60	0.89	1.70	0.91
THC Total	0.15	0.85	0.10	0.93	2.10	0.91	2.10	0.90
CBG Total	0.15	0.71	0.11	0.72				
Total Terpenes	0.20	0.70	0.30	0.65				
THC acid	0.16	0.84	0.11	0.91	2.20	0.90	2.20	0.89
CBD acid	0.20	0.79	0.18	0.90	1.65	0.88	1.75	0.90

PLS models for THC and CBD show good linearity between predicted levels and measured by HPLC-PDA levels of the cannabinoids.

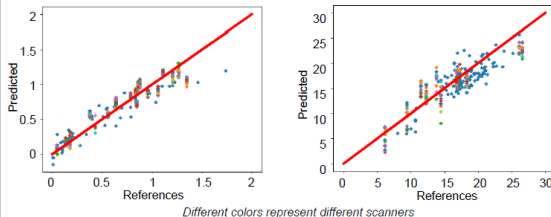


Fig 1. Predicted THC total vs the HPLC-PDA levels in the low range (left) and high range (right).

CONCLUSIONS

Si-Ware technology coupled with Valenveras as the expert in the cannabis sector, provides reliable and robust models. The current FT-NIR technology could be used as an alternative to the classical HPLC and GC analysis for in-situ analysis of the cannabis flowers. Moreover, besides the prediction of the cannabinoids, total terpenes also can be predicted, giving the final user the tools to discriminate between high and low content of phenotypes.

REFERENCES

1. Yao, S., Ball, C., Miyagusuku-Cruzado G., Giusti, M., Aykas, D., Rodriguez-Saona, L. 2022. A novel handheld FT-NIR spectroscopic approach for real-time screening of major cannabinoids content in hemp. Talanta. Sep 1;247:123559
2. Tran, J., Vassiliadis, S., Elkins, A., Cogan, N., Rochfort, S. 2023. Developing Prediction Models Using Near-Infrared Spectroscopy to Quantify Cannabinoid Content in Cannabis Sativa. Sensors (Basel) 2023 Feb 27;23(5):2607.



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Evolution of the Cannabinoid and Terpene Content during the Growth of *Cannabis sativa* Plants from Different Chemotypes

Oier Aizpurua-Olaizola,^{†,‡} Umut Soydaner,[†] Ekin Öztürk,[†] Daniele Schibano,[†] Yilmaz Simsir,[†] Patricia Navarro,[‡] Nestor Etxebarria,[‡] and Aresatz Usobiaga^{*,‡}

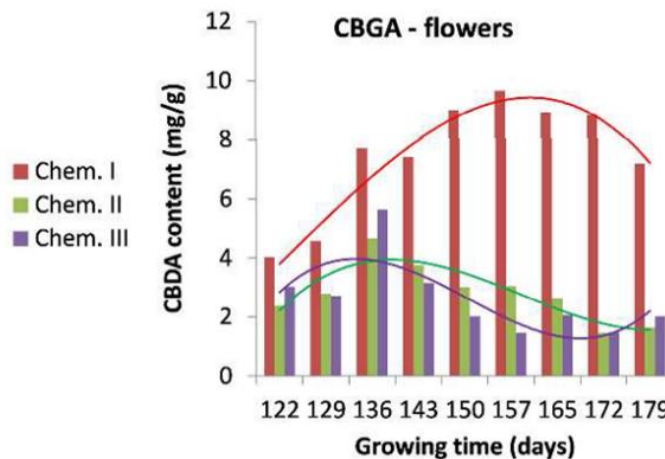
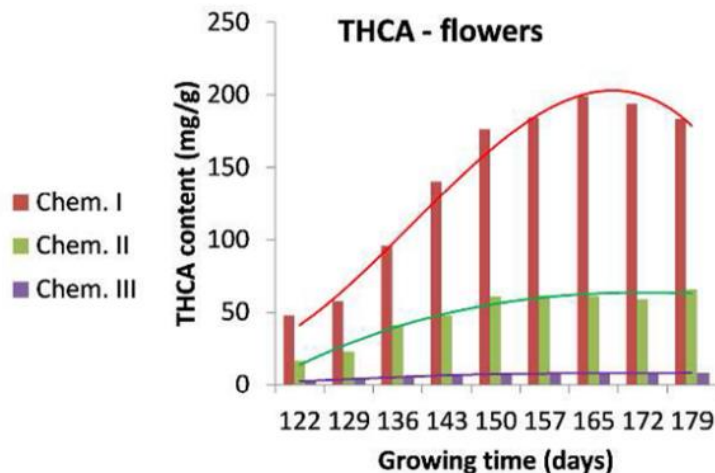
[†]Aifame GmbH, Tüfi 450, 9105 Wald-Schönengrund, Switzerland

[‡]Analytical Chemistry Department, University of the Basque Country (UPV/EHU), Barrio Sarriena s/n, 48940 Leioa, Spain



Oier Aizpurua-Olaizola
Sovereign Fields S.L.
PhD

SOVEREIGN
F I E L D S

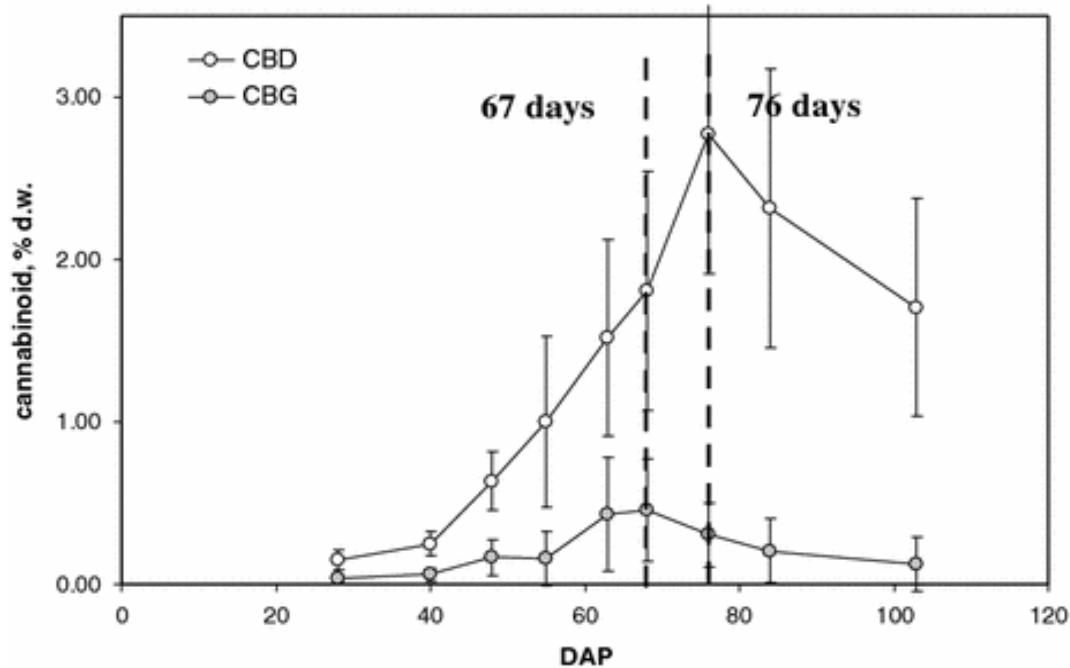


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Yield Optimization: Mastering the Art of Timely Harvest:



Uses Cases: Phenohunting



MIFCO Biosciences obtains a license for the cultivation of Cannabis for medical and research purposes.



MIFCO
BIOSCIENCES



VALENVERAS



NeoSpectra

Uses Cases: Phenohunting



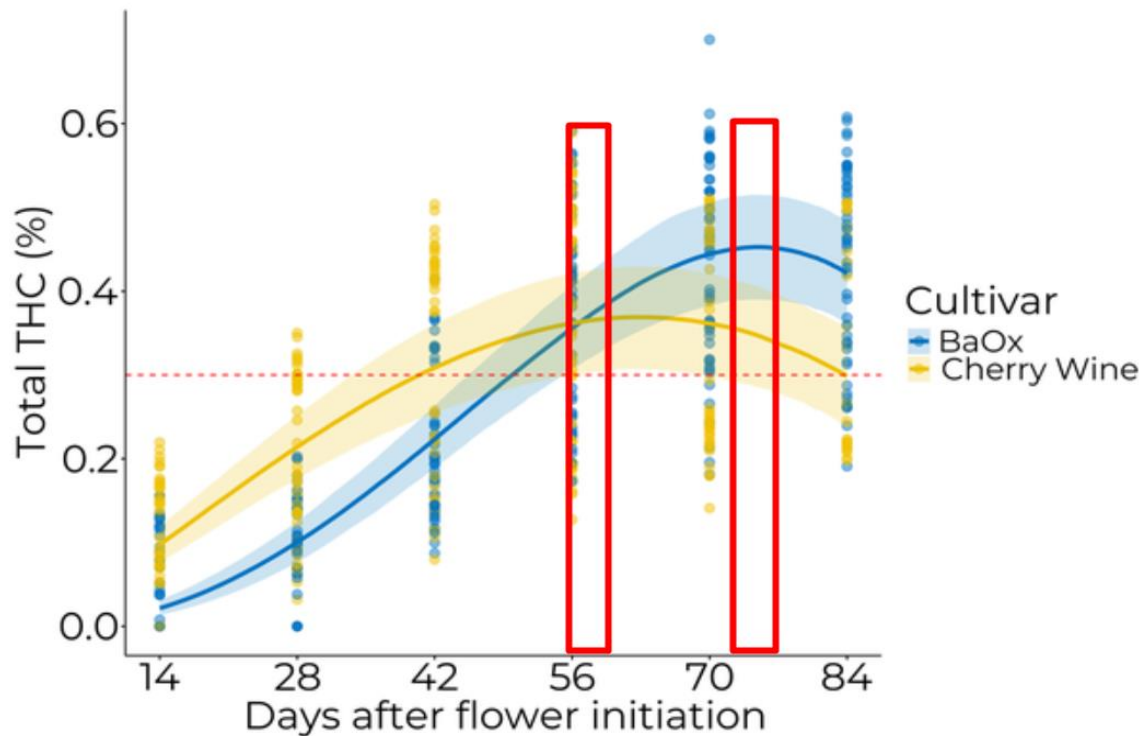
Sample Name	THC Total (%)	THCa (%)	CBD Total (%)	CBG Total (%)	Total Terpenes (%)	A-Bisabolol	A-Humulene	A-Pinene (%)	B-Caryophyll	B-Mircene (%)	B-Pinene (%)
M348 - anÃjilise 13/09/23	25.56	27.5	0.2	0.8	0.8	0.06	0.01	0.01	0.03	0	0
372 anÃjilise 15/09/23	24.6	26.44	0.1	0.7	0.7	0.07	0.01	0	0.04	0.01	0
32 anÃjilise 15/09/23	23.53	25.29	0.2	0.7	0.8	0.08	0	0	0.03	0.02	0
347 anÃjilise 15/09/23	23.49	25.21	0.2	0.7	0.9	0.08	0.01	0	0.04	0	0
M369 analise 13/09/23	23.29	25.01	0.2	0.8	0.7	0.07	0.01	0.01	0.04	0	0
374 anÃjilise 15/09/23	23.27	25.08	0.1	0.6	0.6	0.06	0	0	0.03	0.01	0
M365 - anÃjilise 13/09/23	23.04	24.88	0	0.5	0.5	0.04	0	0	0.01	0.03	0
M79 analise 12/09/23	22.82	24.5	0.2	0.7	0.6	0.07	0	0.01	0.03	0.02	0
349 anÃjilise 15/09/23	22.79	24.57	0.1	0.6	0.5	0.05	0	0.01	0.03	0.01	0
373 anÃjilise 15/09/23	22.77	24.66	0.2	0.6	0.6	0.04	0	0	0.02	0.02	0
360 anÃjilise 15/09/23	22.75	24.53	0.2	0.6	0.7	0.07	0.01	0	0.03	0.01	0
M360 - anÃjilise 13/09/23	22.72	24.45	0.2	0.7	0.6	0.06	0.01	0.01	0.03	0	0
M349 analise 13/09/23	22.72	24.45	0	0.6	0.5	0.05	0	0.01	0.02	0.02	0
M377 - anÃjilise 13/09/23	22.38	24.26	0	0.5	0.6	0.03	0	0.01	0.02	0.01	0
S lote 21 - anÃjilise 22/09	22.17	23.89	0.1	0.8	0.8	0.06	0.01	0.01	0.04	0	0
M345 analise 13/09/23	21.7	23.38	0.2	0.6	0.5	0.06	0	0	0.03	0.01	0
343 anÃjilise 15/09/23	21.67	23.4	0.1	0.6	0.7	0.05	0.01	0	0.04	0	0
M343 analise 13/09/23	21.64	23.35	0	0.6	0.6	0.04	0	0.01	0.03	0.01	0
M374 analise 12/09/23	21.63	23.32	0.1	0.6	0.4	0.04	0	0.01	0.02	0	0
384 anÃjilise 15/09/23	21.55	23.15	0.2	0.7	0.5	0.07	0	0	0.03	0.01	0
5 anÃjilise 19/09/23 Lote 21	21.48	23.09	0.2	0.8	0.6	0.07	0.01	0.01	0.04	0	0
369 anÃjilise 15/09/23	21.48	23	0.3	0.7	0.7	0.08	0.01	0	0.04	0	0
M341 - anÃjilise 13/09/23	21.44	23.09	0	0.6	0.6	0.04	0	0.02	0.02	0.01	0
M373 - anÃjilise 13/09/23	21.41	23.14	0.1	0.6	0.4	0.03	0	0.01	0.02	0.02	0
23 anÃjilise 15/09/23	21.31	23.03	0.3	0.7	0.7	0.07	0.01	0	0.03	0.01	0
M342 - anÃjilise 13/09/23	20.92	22.63	0.1	0.5	0.6	0.03	0	0	0.02	0.02	0
345 anÃjilise 15/09/23	20.9	22.53	0.2	0.5	0.5	0.06	0	0	0.03	0.02	0
M372 - anÃjilise 13/09/23	20.69	22.25	0.1	0.6	0.6	0.05	0	0.01	0.03	0	0
350 anÃjilise 15/09/23	20.23	21.73	0.2	0.7	0.6	0.07	0	0	0.03	0.01	0
M338 analise 13/09/23	20.22	21.8	0.1	0.6	0.4	0.05	0	0.02	0.02	0.02	0
M370 - anÃjilise 13/09/23	20.2	21.91	0.1	0.4	0.5	0.03	0	0	0.02	0.01	0



Uses Cases: Quality Control



Uses Cases: Quality Control



Uses Cases: nutrition correction

Ca/Mg deficiency:



Scan Result		
N	2%	1.8 %
P	0.6%	0.45 %
K	2.2%	2.59 %
Ca	6%	4.43 %
Mg	1.2%	1.47 %
Fe	100ppm	92.22 ppm
Mn	200 ppm	92.91 ppm
Zn	100 ppm	76.9 ppm

METHODOLOGY FOR DRY FLOWERS



1 - Collect the sample

- Collect cannabis samples ensuring they represent the batch accurately. Handle the samples with gloves to prevent contamination.

2 - Grind samples

- Grind a minimum of 3 grams of the dried sample using the grinder until the smallest possible particle size is achieved.
- Clean the grinder between samples to prevent cross-contamination.

3 - Sieving

- Pass the ground sample through a sieve (e.g., 1mm mesh) to achieve a uniform particle size.
- Discard larger particles that do not pass through the sieve.

4 - Analyse

- Start the analysis process.



METHODOLOGY WET FLOWERS



1 - Collect the sample

- Collect cannabis samples ensuring they represent the batch accurately. Handle the samples with gloves to prevent contamination.



2 - Trim samples

- Trim the cannabis as it will appear in the final product. Ensure uniformity to reflect real final flowers.



3 - Dry samples

- Dry the samples using a stove or air cooker set to 140°F (60°C) for 24 hours, or until their weight remains stable.

METHODOLOGY WET FLOWERS



4 - Grind samples

- Grind a minimum of 3 grams of the dried sample using the grinder until the smallest possible particle size is achieved.
- Clean the grinder between samples to prevent cross-contamination.

5 - Sieving

- Pass the ground sample through a sieve (1mm mesh) to achieve a uniform particle size.
- Discard larger particles that do not pass through the sieve.

6 - Analyse

- Start the analysis process.



METHODOLOGY FOR PLANT TISSUE NUTRITION MODEL



1 - Collect the sample

- Collect cannabis samples ensuring they represent the batch accurately. Handle the samples with gloves to prevent contamination.



2 - Dry samples

- Dry the samples using a stove or air cooker set to 140°F (60°C) for 2 hours, or until their weight remains stable.



3 - Grind samples

- Grind a minimum of 1 grams of the dried sample using the grinder until the smallest possible particle size is achieved.
- Clean the grinder between samples to prevent cross-contamination.



4 - Analyse

- Start the analysis process.



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