

# 2017 Industrial Hemp for Grain and 2018 Hemp for CBD

## Lessons Learned



AGRONOMICS | RESEARCH | COMPLIANCE

Experienced. Ethical. Independent.









NAICC









# Independent Agricultural Consultancy

- Nutrient Management Plans
- Precision Planting and Nutrient Application Prescriptions
- In-season Pest Management
- In-season Crop Physiology Management
- Applied Agricultural Research
- Food Safety Compliance



# Crop Services

- 28 growers
- 11 NC and 3 SC counties
- An hour and a half drive north and south
- Mostly 85-125' above sea level; some 325'
- Soils: coastal plain, sandy loam, sand, silt loam, organic (Carolina bays)

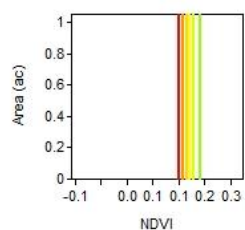
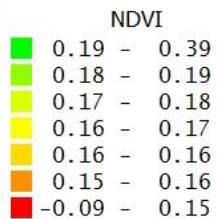
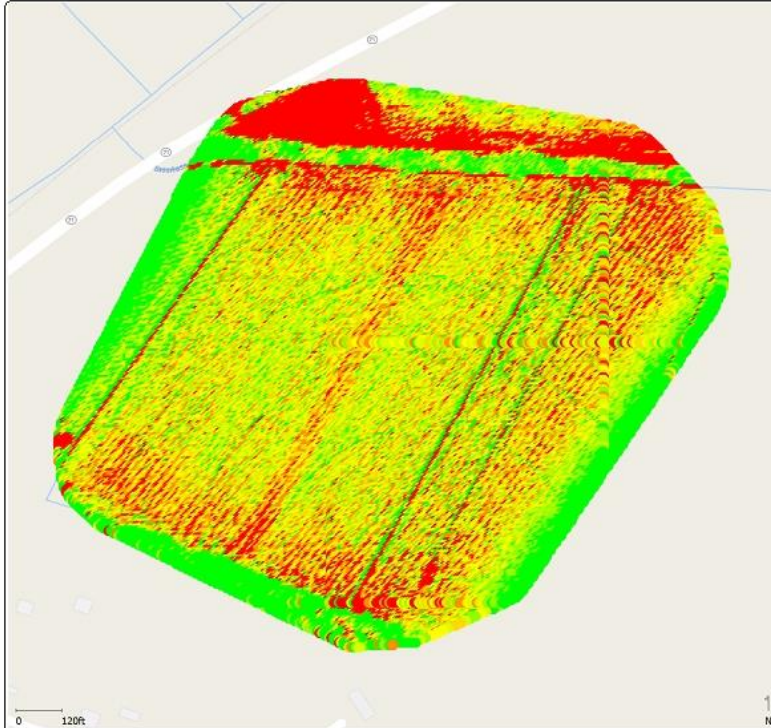




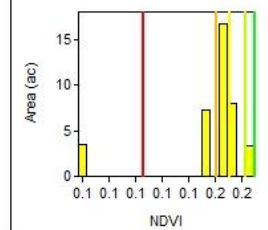
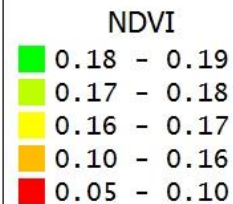
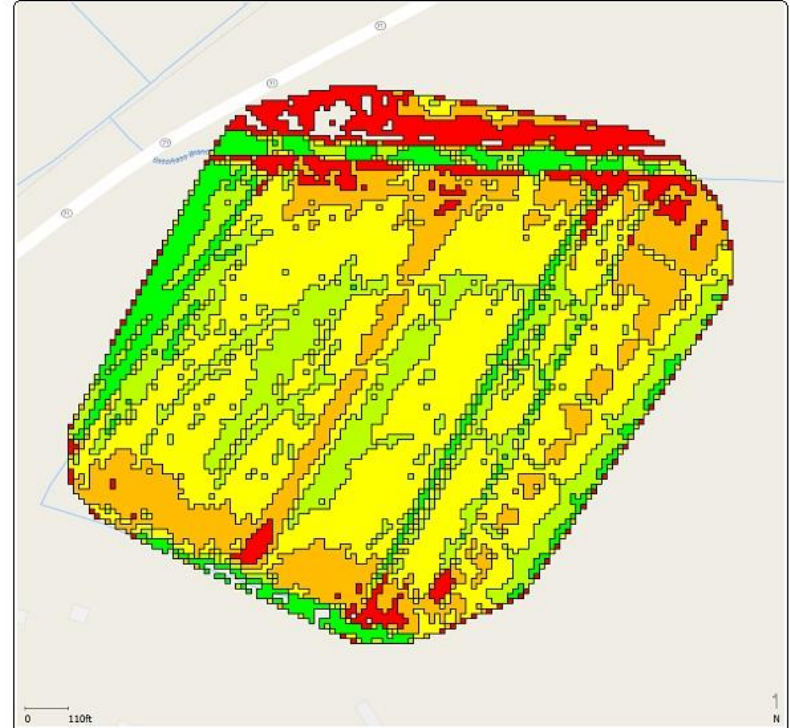


# Research Plot- Y and NDVI

NDVI 2016 - Forbis Farms



NDVI 2016 - Forbis Farms





# Back Road and Little Marsh Farms



















BACK ROAD FARMS

— WHOLESALER NURSERY —

SINCE 2002

# backroadfarms.com

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 **BACK ROAD FARMS** *Ornamental Tree Nursery* 

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Windows taskbar: Internet Explorer, File Explorer, Media Center, Excel, PowerPoint, Outlook, Word, Access, Publisher, Firefox, and a folder icon.

System tray: 4:33 PM 11/13/2018















































CASH CROPS



TODDLER FOUND UNRESPONSIVE

NORTH CAROLINA'S OLDEST NEWSPAPER

# The Fayetteville Observer

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Sunday, July 15, 2018

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## Is hemp the future of N.C. agriculture?



Virginia Tech graduate student Kellie Ellis, left, and former Al Annett, right, look at a hemp plant on his experimental farm near Lumber Bridge on July 6, 2018, who is studying entomology, is researching the corn earworm pest and its prevalence in hemp fields. (JACQUELINE GARNETT/THE FAYETTEVILLE OBSERVER)



MILITARY | F1

### ARMY TO HAVE NEW PT TEST IN 2020

## Trump tweets, hits links before meeting

By Bill Collins and Renata Brito  
The Associated Press

TURNKEY, Scotland — Two days before a high-stakes summit with Russian President Vladimir Putin, President Donald Trump played golf and tweeted Saturday from one of his nameake resorts, blasting his predecessor for Russian election meddling and lashing out at the free press from for-



# Risky Business

- Like going to the bank and withdrawing \$50k in cash then driving to the most crime ridden area of the closest large city. Then you walk around pretending to be in a drunken stupor while flaunting the cash you are carrying.
- “Don’t invest a dollar more than you can afford to loose.” *Sikes*



# Diecious plant





# 2017 Grain Production

Coopérative Centrale des Producteurs  
de Semences de Chanvre

20, rue Paul L. 72000 Le Mans

FRANCE		REPRODUCTION	
SEMENCES CERTIFIÉES		RÈGLES ET NORMES CE	
Esèce :	CHANVRE MONOIQUE CANNABIS SATIVA L.		
Variété :	FELINA 32		
0681	Lot N° :	F1545 X164508 B	
Pays de production	Poids net déclaré		Echantilloné
FRANCE	25 KG BRUT		03 2017

CERTIFICAT 4 071 01 193 G



# 2016 Fallow Winter- Summer cover—2017 No-Till into Cereal Rye and Crimson Clover









“Weed seed in our ‘weed’ seed?”







GAIAC Members

Allen Hubers, Bill, Brad, Brent, Bruce,...



Jun 15, 2017

Does anyone recognize this seed. To my knowledge it's origin is France. It was in some certified hemp seed from France. We are attempting to germinate it to be able to identify it.

4:21 PM ✓







GAIAC Members

Allen Hubers, Bill, Brad, Brent, Bruce,...



+1 (920) 323-3820 ~Stev...

Hard to tell from the photo,  
but it looks like it could be  
from the composite family.  
Could it be some type of  
wild sunflower or thistle?

10:30 PM

Very similar to sunflower  
but smaller.

10:41 PM ✓

Gary Coukell

My guess is Safflower.

10:42 PM

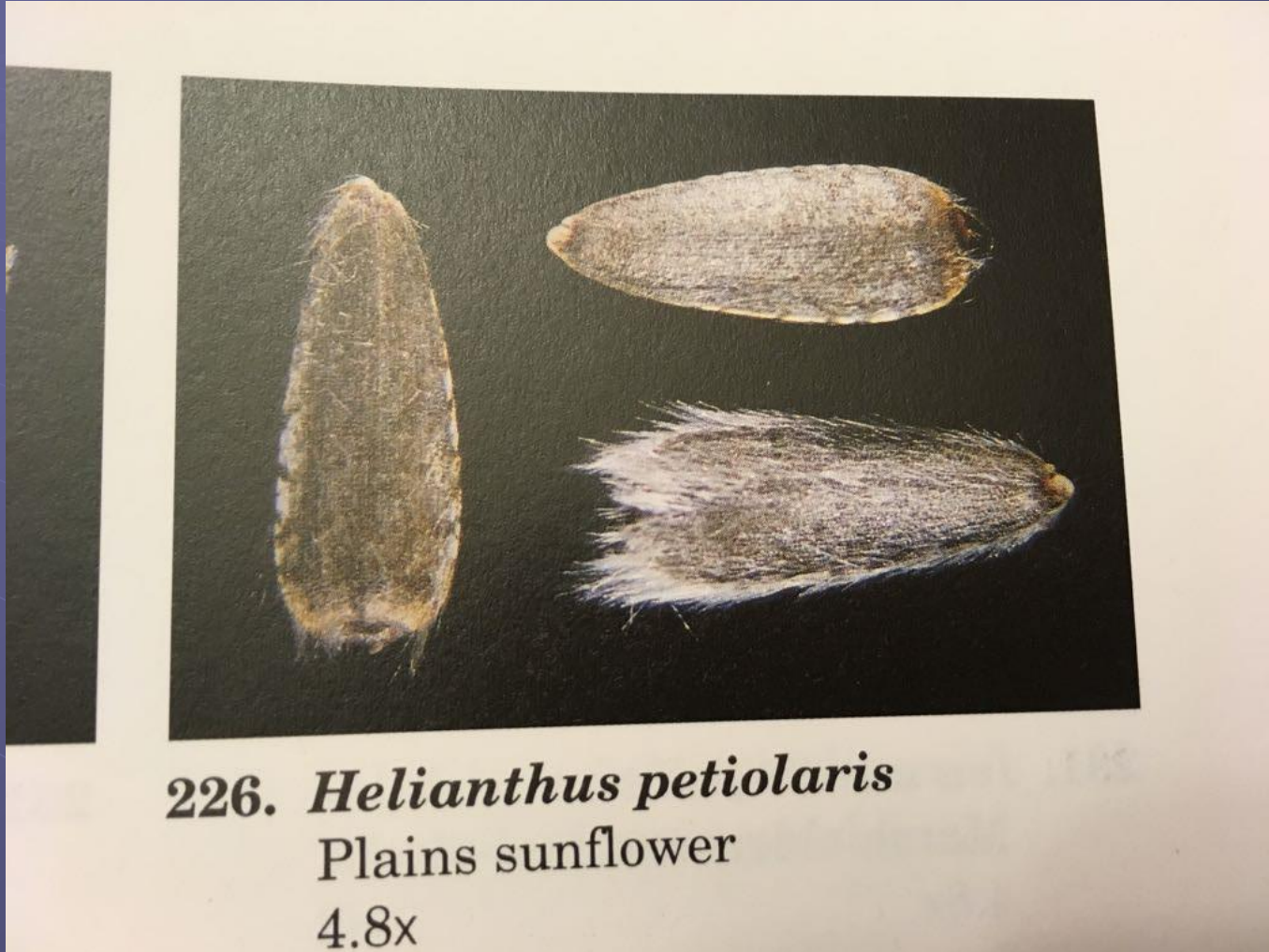
+1 (920) 323-3820 ~Stev...

Plains sunflower looks  
similar. It also makes sense  
that a tall plant could have  
seed co-mingled with





# “Weed seed in our ‘weed’ seed?”





# “Weed seed in our ‘weed’ seed?”



Download from  
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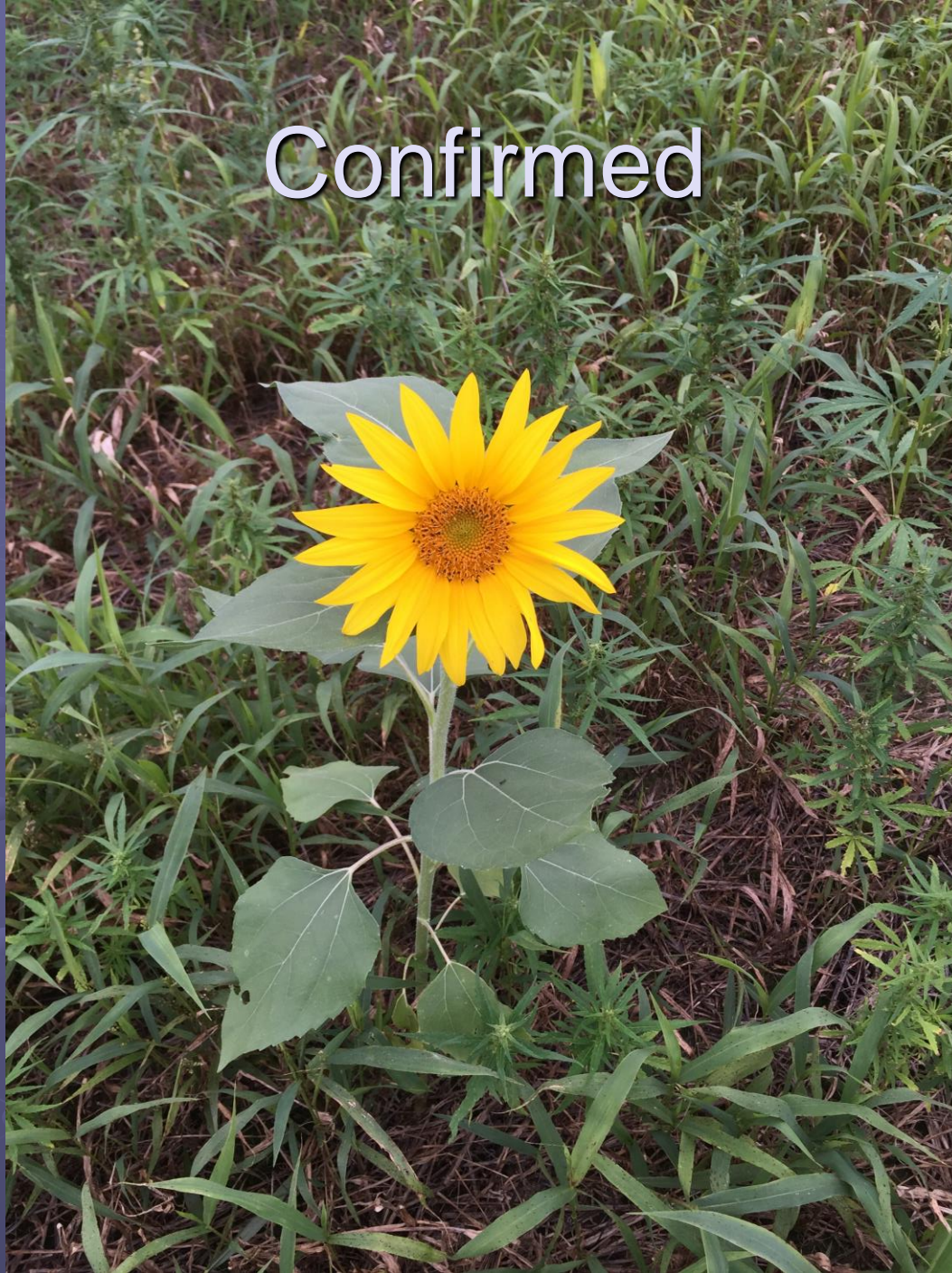
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ID 25098716

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Confirmed





# Industrial Hemp





# Seeding Rate Study





25-35-42-50 lb/ac













Gross Income \$0.00





2018  
Optimistic?



# I. Hemp for Cannabinoids- specificly for Cannabidiol (CBD)





# I. Hemp for Cannabinoids- specificly for Cannabidiol (CBD)

- Growing for grain means selling lbs. of dry seed. Much like traditional agriculture.  
MALE+FEMALE=SEED
- Growing for CBD means you sell molecules in grams to have the highest ROI. Or selling dry flower (stems removed). MALES ARE A WEED or WORSE



# Cash Crop





# 100% Female Clones \$8 per plant





# Day of Transplant

































A Flight Attendant once said “be  
careful when opening overhead  
bins as we all know in life shift  
happens























Heat









Post  
Hurricane  
Florence  
Sept. 14-17





# Taking Out





# Sunshine vs Mold





# Shucking





Little Marsh Farms LLC Hemp for CBD Budget						
2.99 net acres						
Expenses						
Item	Unit	Quantity	Cost/ unit	Total Cost	Cost/Acre	
Variable Cost						
Cover Crop	Ac		\$ 50.00	\$ 225.00	\$ 75.00	
Burn Down	Ac		\$ 16.00	\$ 48.00	\$ 16.00	
Tillage	Ac		\$ 25.00	\$ 112.00	\$ 37.33	
Lime	Ac		\$ 12.00	\$ 36.00	\$ 12.00	
Fertilizer						
Irrigation and Mulch	Ac		\$ 1,200.00	\$ 3,600.00	\$ 1,200.00	
Clones	Plants	3000	\$ 8.00	\$ 24,000.00	\$ 8,000.00	
Irrigation cost	Ac		\$ 1,166.67	\$ 3,500.01	\$ 1,166.67	
Fertigation	Ac			\$ 600.00	\$ 200.00	
THC/CBD Testing	Sample			\$ 375.00	\$ 125.00	
Consultation	Trip			\$ 1,000.00	\$ 333.33	
Crop Insurance	Yr	0	\$ -	\$ -	\$ -	
			Subtotal	\$ 33,496.01	\$ 11,165.34	



# Miscellaneous

Special Equipment						
60" Row Bedder/ Mulch				\$ -	\$ -	
Propane				\$ 204.00	\$ 68.00	
Industrial Fans				\$ 1,470.00	\$ 490.00	
Tarps				\$ 893.97	\$ 297.99	
25KW PTO Generator				\$ 4,295.00	\$ 1,431.67	
Drying Space						
Rubber Bands				\$ 148.00	\$ 49.33	
			Sub Total	\$ 7,010.97	\$ 2,336.99	



# Labor

Labor						
Transplanting	Hour		\$ 14.00	\$ 1,568.00	\$ 522.67	
Hand Weeding	Hour		\$ 12.37	\$ 1,024.00	\$ 341.33	
Backpack Herbicides	Hour		\$ 14.00	\$ 84.00	\$ 28.00	
Field Harvest	Hour		\$ 14.00	\$ 11,872.00	\$ 3,957.33	
Hanging	Hour		\$ 14.00	\$ 6,111.00	\$ 2,037.00	
Debudding	Hour		\$ 14.00	\$ 7,238.00	\$ 2,412.67	
			Sub Total	\$ 27,897.00	\$ 9,299.00	



# Little Marsh Farms LLC Hemp for CBD Budget

2.9 net acres

## Expenses

Item	Unit	Quantity	Cost/ unit	Total Cost	Cost/Acre
Variable Cost					
			Subtotal	\$ 33,496.01	\$ 11,165.34
Fixed- Miscellaneous					
			Sub Total	\$ 7,010.97	\$ 2,336.99
Labor					
			Sub Total	\$ 27,897.00	\$ 9,299.00
Total					
				\$ 68,403.98	\$ 22,801.33



Everyone is an expert.



● “If I was growing hemp, I would get one of y’all in this room to look at it. There are a lot of people getting advice from people calling themselves ‘hemp experts.’ They would be better off getting advice from people like you who have experience with agriculture,” says Dr. Keith Edmisten, speaking to the annual meeting of the North Carolina Agricultural Consultants Association at the Homewood Suites Hotel in Raleigh. (Southeast Farm Press)



Two-spotted spidermite  
*Tetranychus urticae*





Russet Mite  
*Aceria anthocoptes*





Corn  
earworm  
*Helicoverpa*  
*zea*









# Helicoverpa zea





# Diseases and Other Disorders

- Fusarium blight (*Fusarium graminearum*)
- Alternaria leaf spot (*Alternaria* sp./spp.)
- Molds
- Abiotic disorders- plastic mulch(?), root bound





Internal

# Plant Tissue Report

[Links to Helpful Information](#)

Sampled: 07/20/2018

Received: 07/20/2018

Completed: 07/24/2018

Client: Al Averitt

Protech Advisory Service Inc

955 Sandy Grove Rd.

Lumber Bridge, NC 28357

Sampled County: Robeson

Advisor: Georgia Love

PO Box 766

Rowland, NC 28383

PALS #: 402488

PALS #: 401372

Farm: Not Provided

## Sample Information

ID: GOOD

Crop: Hemp, Field

Growth Stage: E

Week: 0

Plant Part: M

Plant Position: 0

## Nutrient Measurements

are given in units of parts per million (ppm or mg/L) unless otherwise specified.

N (%)	P (%)	K (%)	Ca (%)	Mg (%)	S (%)	Fe	Mn	Zn	Cu	B	Mo	NO <sub>3</sub> -N
3.88	0.23 ↓	2.43	3.27	0.67	0.26	105	22.6 ✓	21.7	5.42	44.6 ↓	-	-

## Interpretation Indexes

N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo
-	-	-	-	-	-	-	-	-	-	-	-

## Other Results

Na (%)	Cl (%)	C (%)	DW (g)	Al
0.00	-	-	3.87	38.5

## Nutrient Ratios

N:S	N:K	Fe:Mn
15.0 : 1	1.60 : 1	4.64 : 1

**Agronomist's Comments:** The following are survey ranges for Cannabis in production nurseries at the vegetative stage prior to flowering reported in the Plant Analysis Handbook: N (3.3-4.76%); P (.24-.49%); K (1.83-2.35%); Ca (1.47-4.42%); Mg (.4-.81%); S (.17-.26%); Fe (100-150ppm); Mn (41-83); B (56-105ppm); Cu (5-7.1ppm); Zn (24-52ppm); Mo (.5-1.5ppm). Hunter G. Landis 7/24/2018 8:24 AM

## Sample Information

ID: BAD

Crop: Hemp, Field

Growth Stage: E

Week: 0

Plant Part: M

Plant Position: 0

## Nutrient Measurements

are given in units of parts per million (ppm or mg/L) unless otherwise specified.

N (%)	P (%)	K (%)	Ca (%)	Mg (%)	S (%)	Fe	Mn	Zn	Cu	B	Mo	NO <sub>3</sub> -N
3.58	0.19 ↓	1.70 ↓	1.87	0.42	0.20	92.5	18.5 ↓	18.7 ↓	4.22 ↓	26.4 ↓	-	-

## Interpretation Indexes

N	P	K	Ca	Mg	S	Fe	Mn	Zn	Cu	B	Mo
-	-	-	-	-	-	-	-	-	-	-	-

## Other Results

Na (%)	Cl (%)	C (%)	DW (g)	Al
0.00	-	-	3.74	46.4

## Nutrient Ratios

N:S	N:K	Fe:Mn
18.2 : 1	2.10 : 1	5.01 : 1







# Make Your Own Fungicide

## ● Bourdeaux Mixture

- Copper sulfate
- Hydrated lime
- Phytotoxic



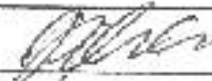

# Canabiniod Profile Testing

● COA- Certificate of Analysis



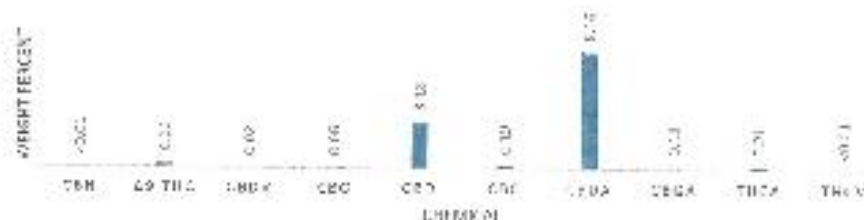
Certificate ID: CS0065\_18740\_001\_C  
 Client Sample ID: 3941  
 Sample Description: Dry Flower  
 Receive sample: 08-Oct-18  
 Initiate analyses: 09-Oct-18

Protech Advisory Services Inc  
 955 Sandy Grove Rd  
 Lumber Bridge, NC 28357  
 Attn: Al Avelil

Analyst: Jacob Edwards	Signature: 	Date: 10-Oct-18
Reviewed by:	Signature: 	Date: 10-Oct-18

Test Type: Total Cannabinoid Profile  
 Technical Procedure: TP A0033-01

#### Results:



Chemical Analyzed	% Dry Weight	Concentration (mg/g)
CBN	<0.01	<0.10
Δ <sup>9</sup> THC	0.26	2.58
CBDV	0.02	0.15
CBG	0.06	0.63
CBD	3.18	31.79
CBC	0.19	1.92
CBDA	8.16	83.58
CBGA	0.18	1.80
THCA	0.21	2.09
THCV	<0.01	<0.10
total THC *	0.44	4.41
total CBD *	10.33	103.34
total	12.25	122.34

\* total THC is calculated by Δ9 THC + 0.877xTHCA

\* total CBD is calculated by CBD + 0.87x/CBDA





At their lab in San Diego, CB Therapeutics founders Jacob Vogan, Chief Scientific Officer, left, and Sher Ali Butt, CEO. The company has bio-engineered yeast that produces cannabinoids using only sugar. (NELVIN C. CEPEDA/SAN DIEGO UNION-TRIBUNE/THC)

## The race to brew better weed

By Brittany Meiling  
The San Diego Union-Tribune

**S**AN DIEGO — Scientists are hustling on behalf of the weed industry to find new ways to produce the most valuable compounds in marijuana, ditching greenhouses in favor of big steel vats of yeast that can 'brew' cannabis like Budweiser brews beer.

The science, once brought to market, would be a goldmine for those who perfect it, giving two separate industries — pharma and legal weed — stable, potent and cheap sources of the ingredients they need.

Right now, the industry's two most

in-demand ingredients are THC, the compound in marijuana that gets you high, and CBD, another cannabis compound used for its medicinal effect. Today, we get those compounds by growing weed plants in large greenhouses, then extracting and isolating the active ingredients. It's a big, dirty and expensive process.

A recent boom in the cannabis industry, however, has driven a need to find cheaper and faster way of getting THC and CBD. Legal weed in particular has increased demand for products that will appeal to non-smokers. Instead of the traditional lump of dried green "flower," pot dispensaries are selling everything from oils, foods and drinks

infused with THC and CBD. The food and drink items (called "edibles") have seen significant growth in recent years, now making up 40 percent of dispensaries' marijuana sales, according to some estimates. They can't grow cannabis fast enough, which is why scientists are trying to produce it in labs.

And biotech companies are trying to deliver.

Instead of growing actual plants, these researchers have found a way to get yeast to do the dirty work. In the simplest terms, scientists insert the genes of a cannabis plant into the DNA of yeast. These mutant strains of yeast

See WEED, D4



<http://www.fayobserver.com/news/20180714/is-hemp-future-of-nc-agriculture>





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