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INDUSTRIAL HEMP PROGRAM

Hemp Permitting and Planning

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INDUSTRIAL HEMP
PROGRAM

First, Introductions!

Introduce yourself in the chat.

Name

Business/Organization

Email or Phone??? << OPTIONAL

Biggest Hemp Challenge (1-3 words)

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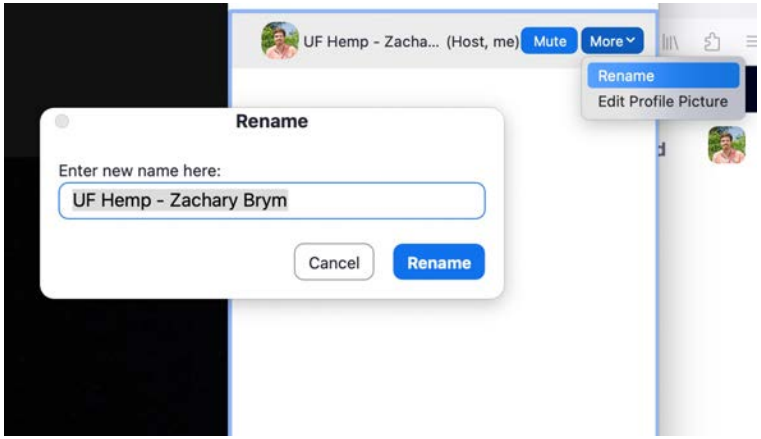
Help others find you in the chat.

Rename Participant.

- sector, company, “need seed”



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Hemp 101 - https://edis.ifas.ufl.edu/AG458

Introducing “Hemp”

Cannabis sativa with THC **<** 0.3% per dry weight

Botanically: indistinguishable from marijuana

Legally: distinguished by THC content

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Hemp 101 - https://edis.ifas.ufl.edu/AG458

Introducing “Hemp” – A Regulated Crop

Cannabis sativa with THC **<** 0.3% per dry weight

Botanically: indistinguishable from marijuana

Legally: distinguished by THC content

Fla. Stat. § 581.217(3) (2021)

(d) **“Hemp” means the plant Cannabis sativa L.** and any part of that plant, including the seeds thereof, and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers thereof, whether growing or not, **that has a total delta-9-tetrahydrocannabinol concentration that does not exceed 0.3 percent on a dry-weight basis.**

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Introducing “Hemp” – A Regulated Crop

Cannabis sativa with THC **<** 0.3% per dry weight

Botanically: indistinguishable from marijuana
Legally: distinguished by THC content

Economically: alternative crop waiting market demand
Ecologically: potential invasive species

Fla. Stat. § 581.217(3) (2021)
(d) **“Hemp” means the plant Cannabis sativa L.** and any part of that plant, including the seeds thereof, and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers thereof, whether growing or not, **that has a total delta-9-tetrahydrocannabinol concentration that does not exceed 0.3 percent on a dry-weight basis.**

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Same Plant, Different Crops

Fiber (Stem)

Grain (Seed)

Flower (CBD)

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Available Resources

programs.ifas.ufl.edu/hemp

fdacs.gov/hemp

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INDUSTRIAL HEMP PROGRAM

Cultivation Licensing

Who needs a cultivation license??

Person or business that introduces, moves, or cultivates hemp

- Commercial growing only - not for personal use
- No minimum or maximum acreage requirements.
- No cost for license *(computer, fingerprints)
- Licenses expire after one year from date of issue.

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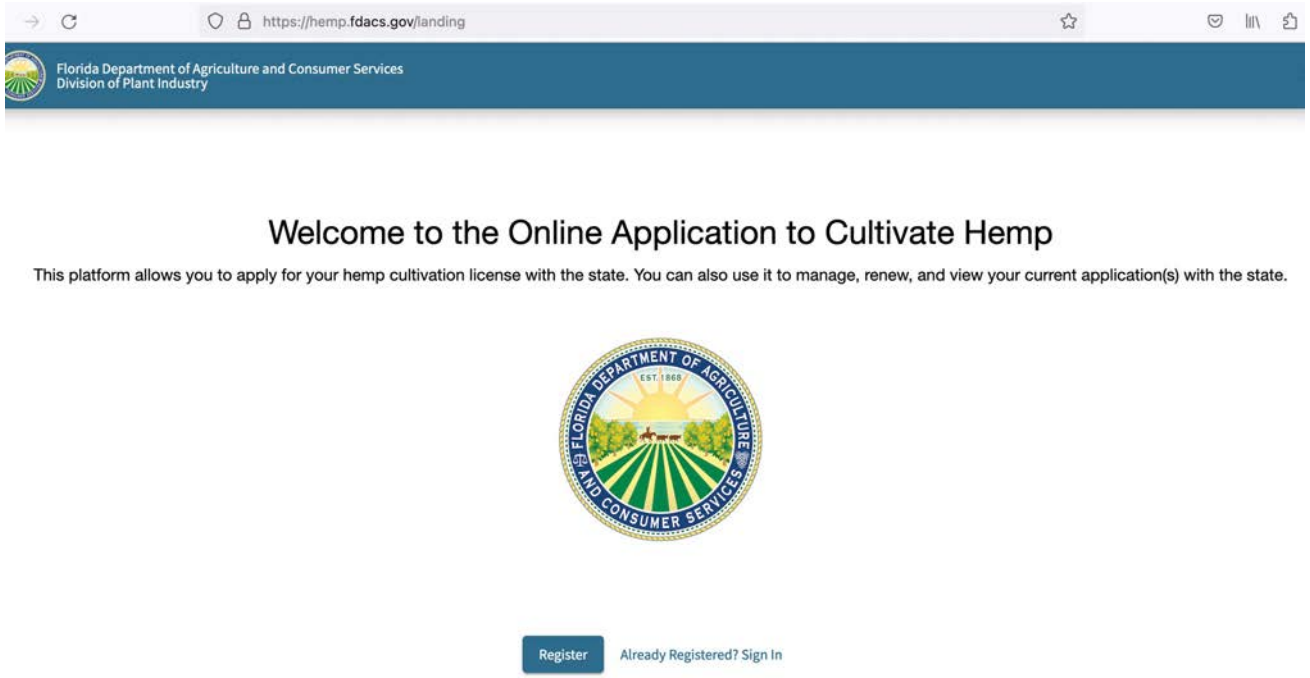
Cultivation License

hemp.fdacs.gov



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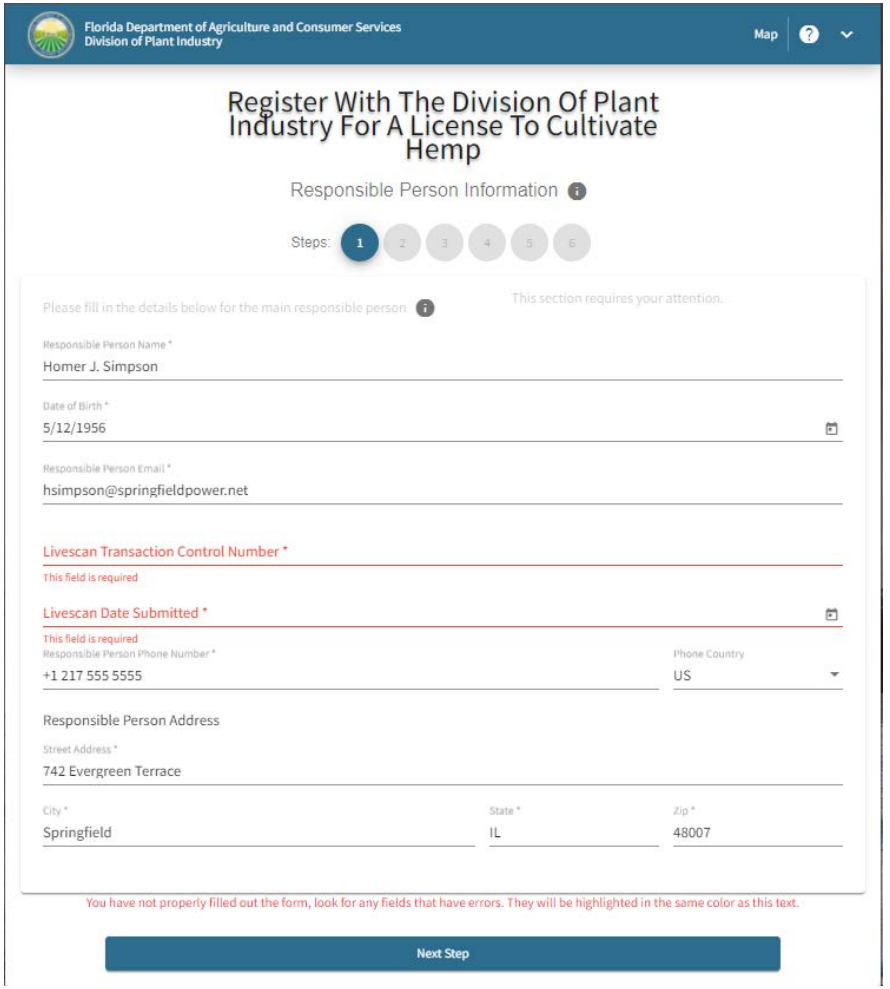
Cultivation License

- Responsible Person Name, Business Name, Business EIN (Employer Identification Number), and required contact information
- Intended hemp commercial production market sector (Seed, Fiber, Oil, Nursery Plants)



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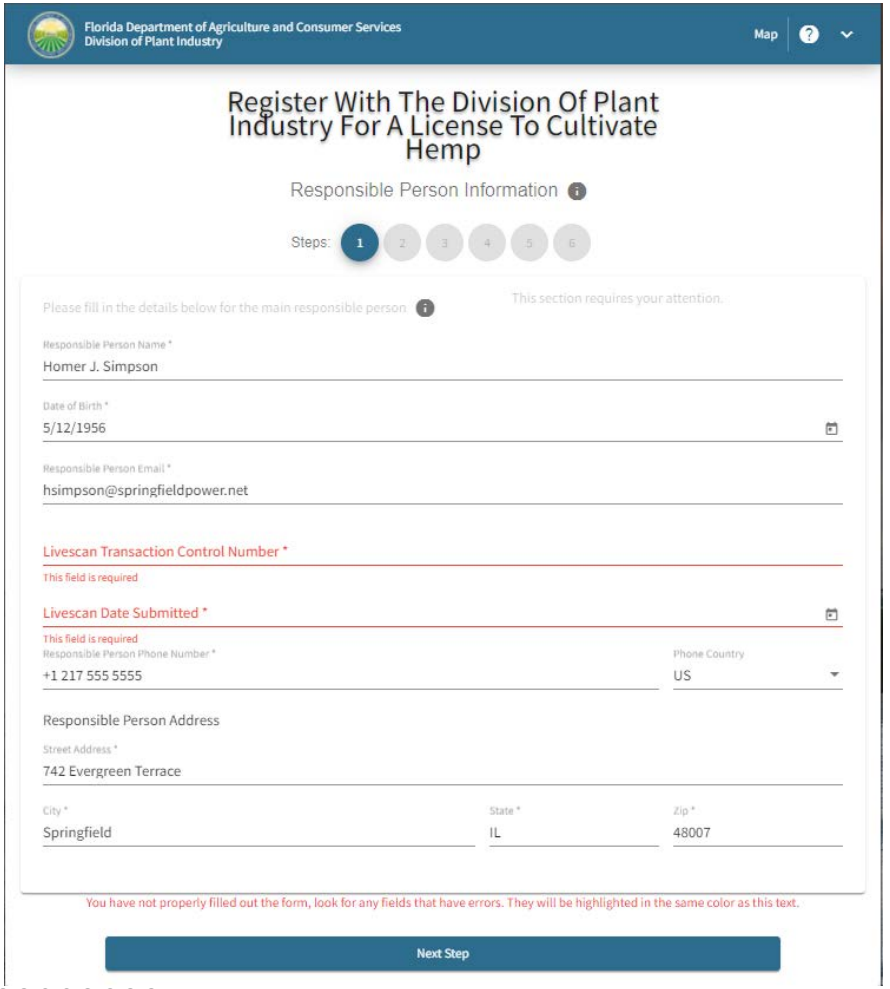
Cultivation License

- Cultivation address with GPS coordinates
- Tax parcel number
- Land use zoning
- Growing size (acres or square feet)
- Anticipated planting and harvest dates
- Storage location address and GPS coordinates
- Environmental Containment Plan



Commentary on hemp invasion risk and management:
https://www.sciencedirect.com/science/article/pii/S0006320722002622

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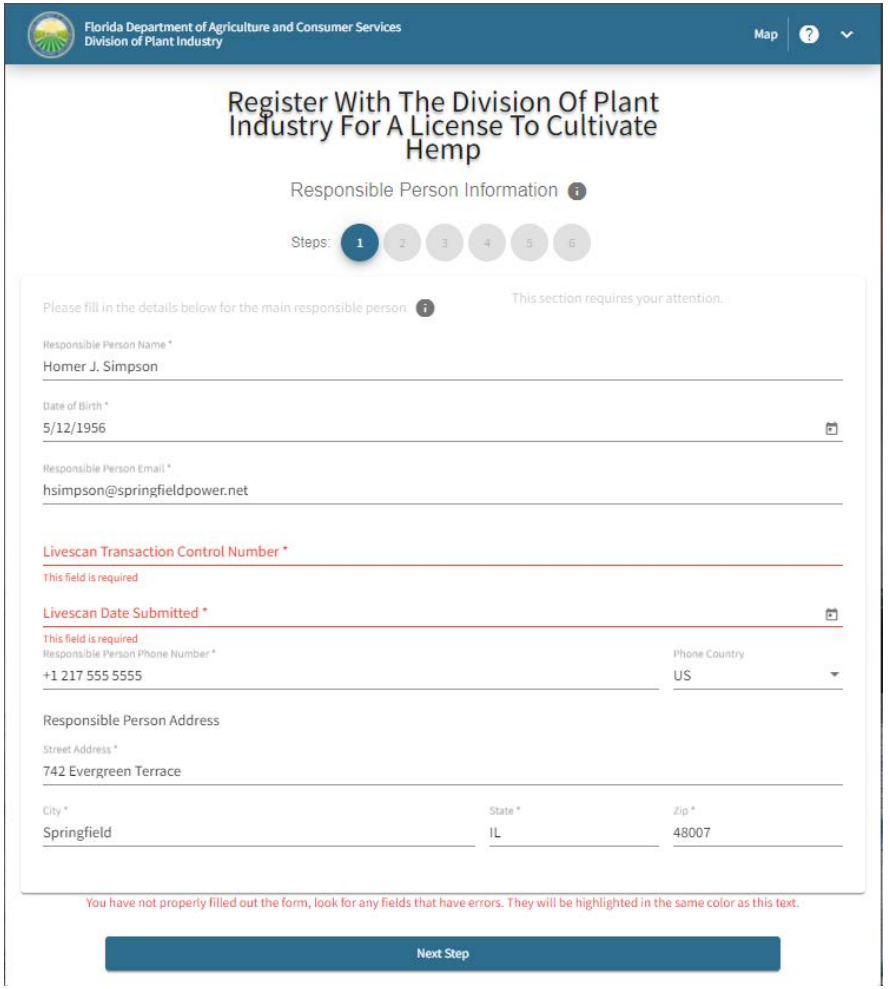
Cultivation License

- Must undergo annual background check and fingerprinting through the Livescan system ($80).

- The background check requires an ORI number (Originating Agency Identifier) that the Florida Department of Law Enforcement has assigned to FDACS: FL925080Z.



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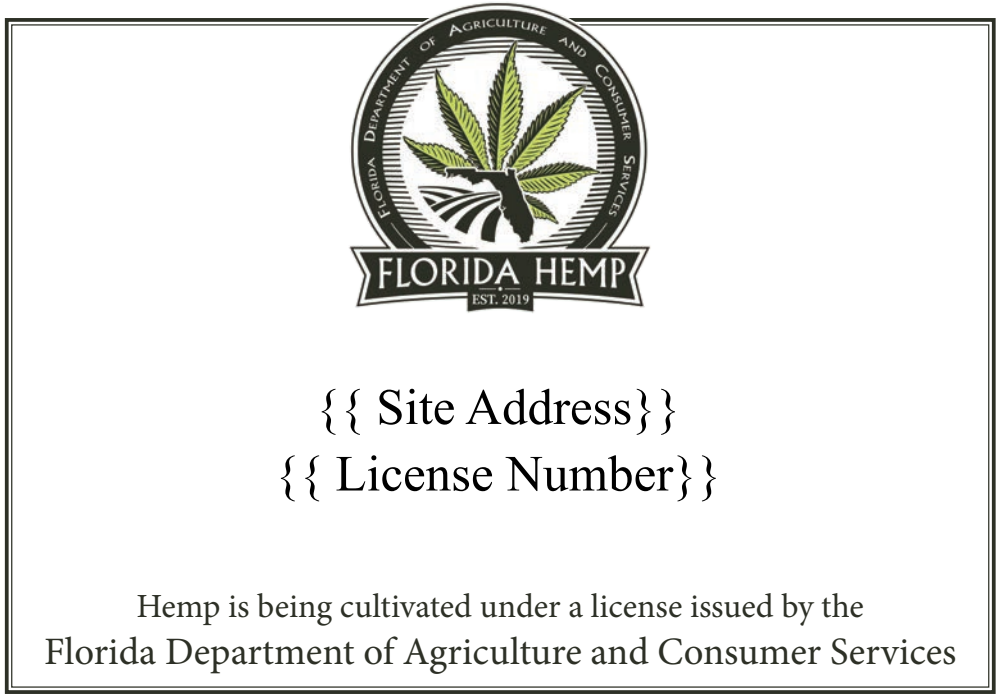
Cultivation License

- Signage
- Annual inspection
- Records for three years
- Harvest testing T-30 days
- Harvest notice: DPIHemp@fdacs.gov



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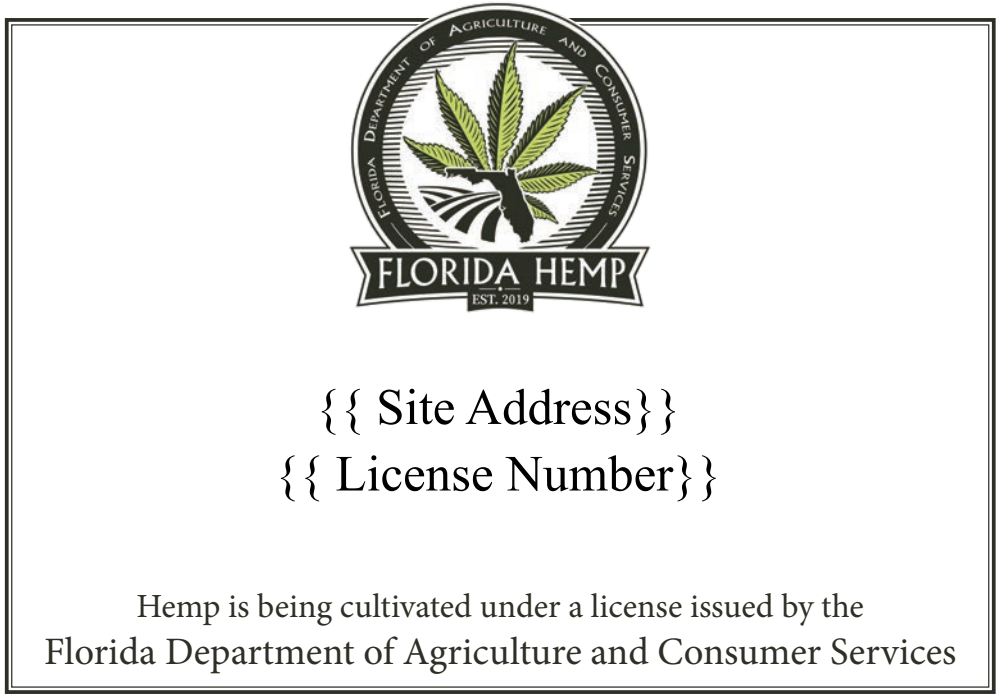
Chat poll!

1. Type your answer in the chat.
2. Wait for my signal to send.



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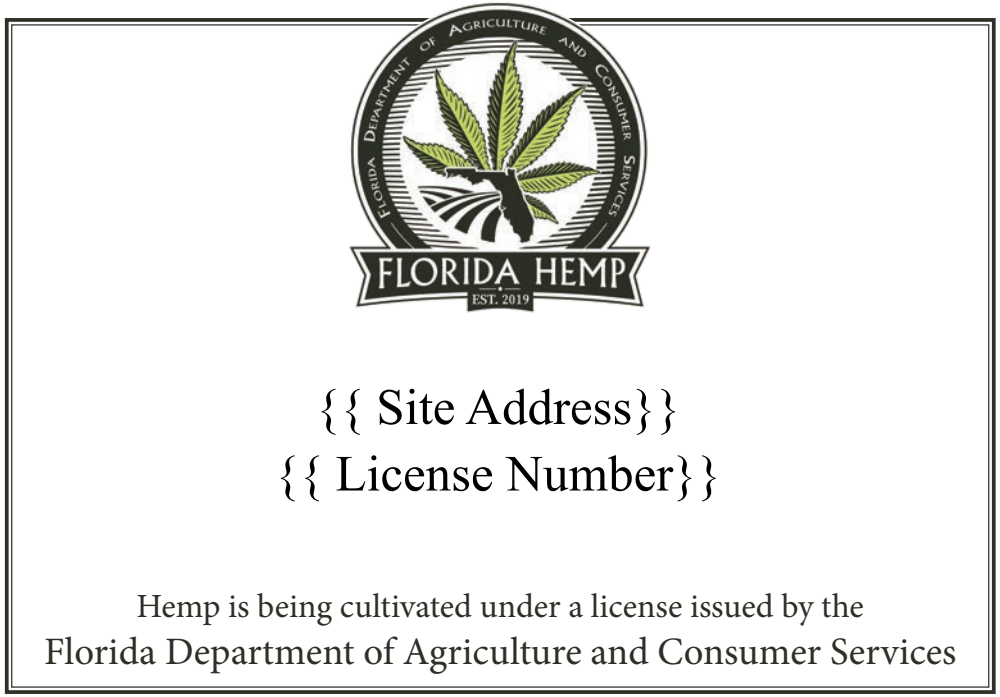
Cultivation License

- Signage
- Annual inspection
- Records for three years
- Harvest testing T-30 days
- Harvest notice: DPIHemp@fdacs.gov

Chat poll!

1. Type your answer in the chat.
2. Wait for my signal to send.

> How many acres approved for harvest in 2022 in FL??



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Other Hemp-related Licensing Info

Seed or Pet Food Dealer

- $10 - 40 per item or lot
- FDACS Agricultural Environmental Services
  850-617-7866

Nursery and Stock Dealer

- $25 - $69 / location
- FDACS Division of Plant Industries
  1-888-397-1517 or 352-395-4600

Hemp Food Establishments

- $650 / business
- FDACS Food Safety: 850-245-5520
- FL Dept of Health: 850-245-4657

Florida Department of Agricultural and Consumer Services
Division of Plant Industry

WILTON SIMPSON
COMMISSIONER

APPLICATION FOR CERTIFICATE OF REGISTRATION

Section 581.131, F.S. / Incorporated in Rule 5B-2.0011, F.A.C.
Referenced in Rules 5B-2.002 and 5B-62.007(2) (a), F.A.C.

Phone (352) 395-4700

Remit **online payment** at www.FDACS.gov
Or
Check or Money order payable to:

FDACS
P.O. Box 6720
Tallahassee, FL 32314-6720

PLEASE PRINT ALL INFORMATION

Batch #: 345A
Exp. Date: 12/31/2022

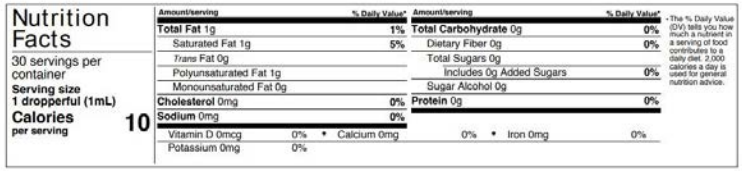
Hemp Extract Tincture

1 fl. oz. (30 ml)

Ingredients: Coconut Oil,Full Spectrum Hemp Extract Contains: Coconut

15 mg of **CBD** per serving

Sample CBD Co., Orlando, FL 32810. Find more info at: www._____.com



Nutrition Facts

30 servings per container
Serving size
1 dropperful (1mL)
Calories 10
per serving

Amount/serving	% Daily Value*
Total Fat 1g	1%
Saturated Fat 1g	5%
Trans Fat 0g	
Polyunsaturated Fat 1g	
Monounsaturated Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Vitamin D 0mcg	0%
Potassium 0mg	0%
Calcium 0mg	0%

Amount/serving	% Daily Value*
Total Carbohydrate 0g	0%
Dietary Fiber 0g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Sugar Alcohol 0g	
Protein 0g	0%
Iron 0mg	0%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

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INDUSTRIAL HEMP
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Budgets and Marketing

Hemp 101 - https://edis.ifas.ufl.edu/AG459

Uses for Hemp

Fiber (Stem)

- Paper
- Textiles & fabric
- Bedding
- Bioplastics
- Auto parts
- Construction material
- Environmental remediation

Grain (Seed)

- Medications
- Health foods
- Cosmetics
- Lotions
- Bio-fuels/diesel

Flower (CBD)

- CBD Hemp oil
- Seizures
- Health products
- Medications
- Cancer research

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Fiber Production Budget

- LiveScan Prints
- Seed
- Fertilizer
- Irrigation
- Labor
- Testing

… **$6,700 cost / acre**

Table 1. Estimated Cost of Growing and Harvest Industrial Hemp for Fiber

Item	*Description*	*Unit*	*Quantity*	*$/unit*	*$/acre*
Estimated Variable Costs					
Application Fee		*acre*	0.05	$80.00	$4.00
License Fee		*acre*	0.00	$0.00	$0.00
Soil Test	(1 sample per 5 acres)	*acre*	0.20	$8.00	$1.60
Crop Insurance		*acre*	1.00	$0.00	$0.00
Seed		*acre*	50.00	$2.00	$100.00
Fertilizer, Synthetic	Nitrogen (N)	*lbs.*	100.00	$1.15	$115.00
	Phosphorus (P)	*lbs.*	30.00	$0.89	$26.70
	Potassium (K)	*lbs.*	45.00	$0.58	$26.10
	Micronutrients	*lbs.*	0.00	$0.00	$0.00
	Synthetic Fertilizer Procurement	*miles*	0.00	$0.00	$0.00
Custom Fertilizer Spread	Synthetic Fertilizer Application	*application*	2.00	$4.25	$8.50
Lime	(Prorated over 5 years)	*tons*	0.50	$35.00	$17.50
Custom Lime Spread	(Prorated over 5 years)	*tons*	0.50	$4.25	$2.13
Pesticide	Chemicals	*acre*	0.00	$0.00	$0.00
	Chemical Application	*acre*	0.00	$0.00	$0.00
Weed Control	Chemicals	*acre*	0.00	$0.00	$0.00
	Chemical Application	*application*	0.00	$0.00	$0.00
Mach. & Equipment	Maint., Fuel, Oil, Lube	*acre*	1.00	$45.68	$45.68
Hired Labor	Planting and In-Season	*hours*	100.00	$13.34	$1,334.00
Hired Labor	Harvest	*hours*	100.00	$13.34	$1,334.00
Hired Labor	Post Harvest	*hours*	150.00	$13.34	$2,001.00
Irrigation	Drip Tape	*foot*	5400.00	$0.08	$432.00
Irrigation	Pump	*hours*	75.00	$2.15	$161.25
Testing Fee		*acre*	1.00	$100.00	$100.00
Hauling		*miles*	30.00	$4.50	$135.00
Drying		*pounds*	0.00	$0.00	$0.00
Crop Consultant		*hours*	0.00	$0.00	$0.00
Unallocated Labor		*hours*	0.00	$0.00	$0.00
Misc. Expenses		*acre*	0.00	$0.00	$0.00
Interest on ½ of Operating Costs		*dollars*	$5,840.46	6.25%	$365.03
Total Variable Costs					**$6,205.48**
Estimated Fixed Costs					
Land Rent			1.00	$100.00	$100.00
Mach. & Equipment	Ownership costs	*acre*	1.00	$32.50	$32.50
Irrigation		*acre*	1.00	$0.00	$0.00
Drying Facility Lease		*acre*	1.00	$0.00	$0.00
Drying Materials		*acre*	1.00	$0.00	$0.00
General Overhead	Taxes, Insurance, etc.	*dollars*	$6,205.48	7%	$434.38
Total Fixed Costs					**$466.88**
Total Cost of Growing and Harvesting Industrial Hemp for Fiber					**$6,672.37**

**Please note that the information availabe in these budget is not a recommendation.*

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Fiber Production Budget

- LiveScan Prints
- Seed
- Fertilizer
- Irrigation
- Labor
- Testing

… **$6,700 cost / acre**

- Insurance?
- Pesticide?
- Drying/Processing?
- Consultant?

Table 1. Estimated Cost of Growing and Harvest Industrial Hemp for Fiber

Item	*Description*	*Unit*	*Quantity*	*$/unit*	*$/acre*
Estimated Variable Costs					
Application Fee		*acre*	0.05	$80.00	$4.00
License Fee		*acre*	0.00	$0.00	$0.00
Soil Test	(1 sample per 5 acres)	*acre*	0.20	$8.00	$1.60
Crop Insurance		*acre*	1.00	$0.00	$0.00
Seed		*acre*	50.00	$2.00	$100.00
Fertilizer, Synthetic	Nitrogen (N)	*lbs.*	100.00	$1.15	$115.00
	Phosphorus (P)	*lbs.*	30.00	$0.89	$26.70
	Potassium (K)	*lbs.*	45.00	$0.58	$26.10
	Micronutrients	*lbs.*	0.00	$0.00	$0.00
	Synthetic Fertilizer Procurement	*miles*	0.00	$0.00	$0.00
Custom Fertilizer Spread	Synthetic Fertilizer Application	*application*	2.00	$4.25	$8.50
Lime	(Prorated over 5 years)	*tons*	0.50	$35.00	$17.50
Custom Lime Spread	(Prorated over 5 years)	*tons*	0.50	$4.25	$2.13
Pesticide	Chemicals	*acre*	0.00	$0.00	$0.00
	Chemical Application	*acre*	0.00	$0.00	$0.00
Weed Control	Chemicals	*acre*	0.00	$0.00	$0.00
	Chemical Application	*application*	0.00	$0.00	$0.00
Mach. & Equipment	Maint., Fuel, Oil, Lube	*acre*	1.00	$45.68	$45.68
Hired Labor	Planting and In-Season	*hours*	100.00	$13.34	$1,334.00
Hired Labor	Harvest	*hours*	100.00	$13.34	$1,334.00
Hired Labor	Post Harvest	*hours*	150.00	$13.34	$2,001.00
Irrigation	Drip Tape	*foot*	5400.00	$0.08	$432.00
Irrigation	Pump	*hours*	75.00	$2.15	$161.25
Testing Fee		*acre*	1.00	$100.00	$100.00
Hauling		*miles*	30.00	$4.50	$135.00
Drying		*pounds*	0.00	$0.00	$0.00
Crop Consultant		*hours*	0.00	$0.00	$0.00
Unallocated Labor		*hours*	0.00	$0.00	$0.00
Misc. Expenses		*acre*	0.00	$0.00	$0.00
Interest on ½ of Operating Costs		*dollars*	$5,840.46	6.25%	$365.03
Total Variable Costs					**$6,205.48**
Estimated Fixed Costs					
Land Rent			1.00	$100.00	$100.00
Mach. & Equipment	Ownership costs	*acre*	1.00	$32.50	$32.50
Irrigation		*acre*	1.00	$0.00	$0.00
Drying Facility Lease		*acre*	1.00	$0.00	$0.00
Drying Materials		*acre*	1.00	$0.00	$0.00
General Overhead	Taxes, Insurance, etc.	*dollars*	$6,205.48	7%	$434.38
Total Fixed Costs					**$466.88**
Total Cost of Growing and Harvesting Industrial Hemp for Fiber					**$6,672.37**

**Please note that the information availabe in these budget is not a recommendation.*

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Flower Production Budget

- LiveScan Prints
- Plants
- Fertilizer
- Irrigation
- Labor!!
- Testing!!

  … **$17,000 cost / acre**

- Insurance?
- Pesticide?
- Drying/Processing?
- Consultant?

Table 2. Estimated Cost of Growing and Harvest Industrial Hemp for CBD

Item	*Description*	*Unit*	*Quantity*	*$/unit*	*$/acre*
Estimated Variable Costs					
Application Fee		*acre*	1.00	$80.00	$80.00
License Fee		*acre*	1.00	$650.00	$650.00
Soil Test	(1 sample per 5 acres)	*acre*	0.20	$8.00	$1.60
Crop Insurance		*acre*	1.00	$0.00	$0.00
Plastic Mulch		*acre*	1.00	$275.00	$275.00
Transplants		*acre*	1500.00	$5.25	$7,875.00
Fertilizer, Synthetic	Nitrogen (N)	*lbs.*	100.00	$1.15	$115.00
	Phosphorus (P)	*lbs.*	60.00	$0.89	$53.40
	Potassium (K)	*lbs.*	60.00	$0.58	$34.80
	Micronutrients	*lbs.*	0.00	$0.00	$0.00
	Synthetic Fertilizer Procurement	*miles*	0.00	$0.00	$0.00
Custom Fertilizer Spread	Synthetic Fertilizer Application	*application*	2.00	$4.25	$8.50
Lime	(Prorated over 5 years)	*tons*	0.50	$35.00	$17.50
Custom Lime Spread	(Prorated over 5 years)	*tons*	0.50	$4.25	$2.13
Pesticide	Chemicals	*acre*	0.00	$0.00	$0.00
Pesticide Application	Chemical Application	*acre*	0.00	$0.00	$0.00
Weed Control	Chemicals	*acre*	0.00	$0.00	$0.00
Weed Control	Chemical Application	*application*	0.00	$0.00	$0.00
Mach. & Equipment	Maint., Fuel, Oil, Lube	*acre*	1.00	$168.12	$168.12
Hired Labor	Planting and In-Season	*hours*	100.00	$13.34	$1,334.00
Hired Labor	Harvest	*hours*	100.00	$13.34	$1,334.00
Hired Labor	Post Harvest	*hours*	150.00	$13.34	$2,001.00
Irrigation	Drip Tape	*foot*	5400.00	$0.08	$432.00
Irrigation	Pump	*hours*	75.00	$2.15	$161.25
Heavy Metal Test		*acre*	1.00	$105.00	$105.00
Pesticide Residue Test		*acre*	1.00	$170.00	$170.00
Testing Fee		*acre*	1.00	$250.00	$250.00
Shipping Totes		*acre*	5.00	$38.00	$190.00
Hauling		*miles*	0.00	$0.00	$0.00
Drying		*pounds*	0.00	$0.00	$0.00
Crop Consultant		*hours*	0.00	$0.00	$0.00
Misc. Expenses		*acre*	0.00	$0.00	$0.00
Interest on ½ of Operating Costs		*dollars*	$14,528.30	6.25%	$908.02
Total Variable Costs					**$15,436.31**
Estimated Fixed Costs					
Land Rent			1.00	$0.00	$0.00
Mach. & Equipment	Ownership costs	*acre*	1.00	$78.03	$78.03
Irrigation		*acre*	1.00	$401.32	$401.32
Drying Facility Lease		*acre*	1.00	$0.00	$0.00
Drying Materials		*acre*	1.00	$0.00	$0.00
General Overhead		*dollars*	$15,436.31	7%	$1,080.54
Total Fixed Costs					**$1,559.89**
Total Cost of Growing and Harvesting Industrial Hemp for CBD					**$16,996.21**

**Please note that the information availabe in these budget is not a recommendation.*

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Production Budget Take Aways

- Need to control market & production risk
- Have a market (and contract) before planting
- Work with a lawyer to ensure the viability of the contract
- Explore insurance opportunities before planting
- Analyze costs to determine potential profitability
- Determine the right time to enter

The initial boom is probably over but potential for upside with demand from new processors and products.

Fiber/seed … **$6,700 cost / acre**
1800 lbs/ ac *
$0.24/lb… **$432 price / acre**

Flower… **$17,000 cost / acre**
2 lbs flower/plant *
5000 plants/acre *
$1.50/lb… **$15,000 price/acre**

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INDUSTRIAL HEMP
PROGRAM

Farm Planning

Choose a hemp crop.

Fiber (Stem)

Grain (Seed)

CBD (Flower)

Get to work.

Get to work…

Hemp Farming Plan

Project Name:				**Date Created / Revised:**
FDACS Hemp License Number:				
Production Market:	Fiber	Seed	Flower	Other
Land Prep Date:		**Planting Date:**		**Harvest Date:**
Personnel:				
Land Preparation:	Row Spacing? in____ x between____		Buffers?	Installation materials?
Planting:	Source?	Rate?	Placement?	Equipment?
Irrigation:	Source?	Rate?	Placement?	Equipment?
Fertilizer:	Source?	Rate?	Placement?	Equipment?
Protection:	Source?	Rate?	Placement?	Equipment?
Harvest:	Testing?	Timing?	Method?	Processing?

Monitoring: (e.g., weather, plant health, pests)

Personnel and Equipment Maintenance:

Long-term Maintenance: (e.g., rotation, climate, surrounding land/neighbors)

What happens next?

What could possibly go wrong?

Farm map and plan (on back)

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What farmers should know -

Know your hemp crop.

Fiber (Stem)	**Grain** (Seed)	**CBD** (Flower)
• On-the-flat	• 3-foot-center mounds	• 6-foot-center beds
• Direct seed	• Direct seed	• Transplanted
• 750,000-1.3 million #/ac	• 100,000–250,000 #/ac	• 2,500-20,000 #/ac
• 90-100 days	• 100-120 days	• 60-120 days
• Pollination independent	• Pollination necessary	• Pollination avoided
• Harvest at first flower	• Harvest by seed maturity	• Harvest by THC test
• Machine harvest stems	• Combine harvest seeds	• Hand harvest flowers
• Low cost – low value	• Low cost – low value	• High cost – high value

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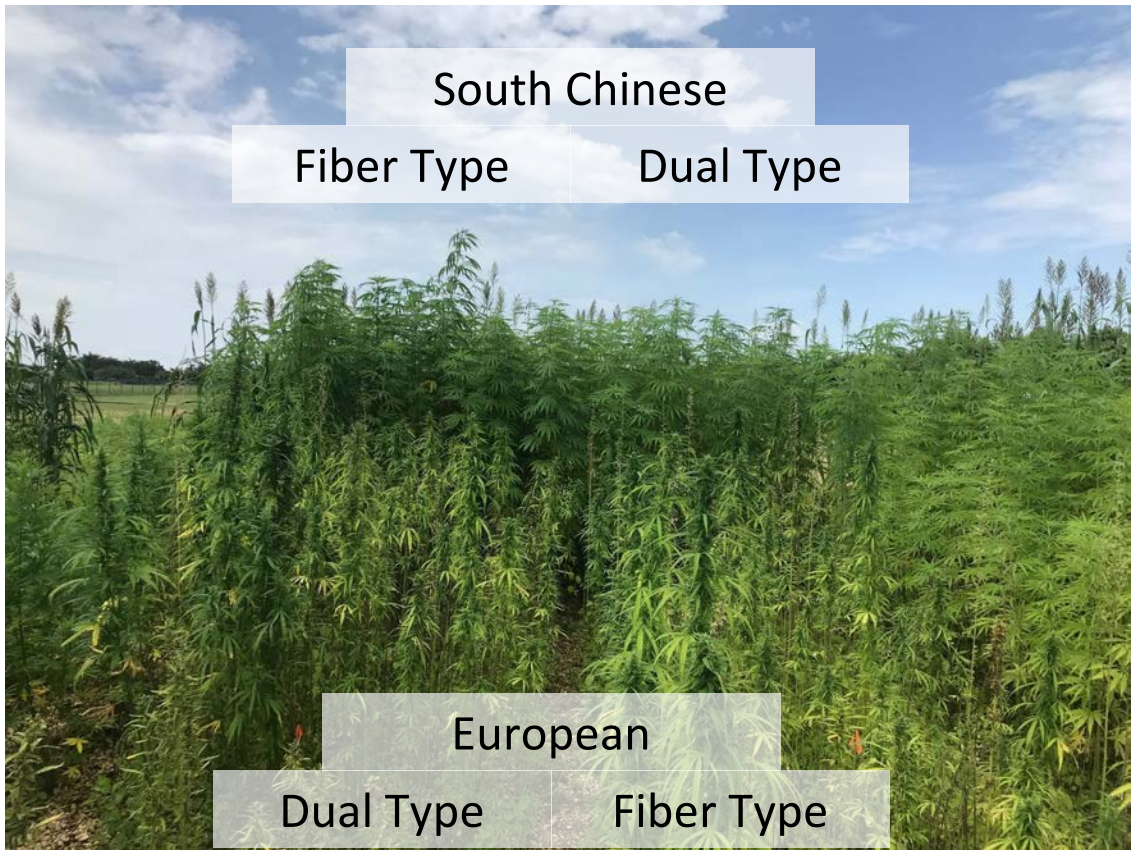
Dates by Flower Development



Will Wadlington

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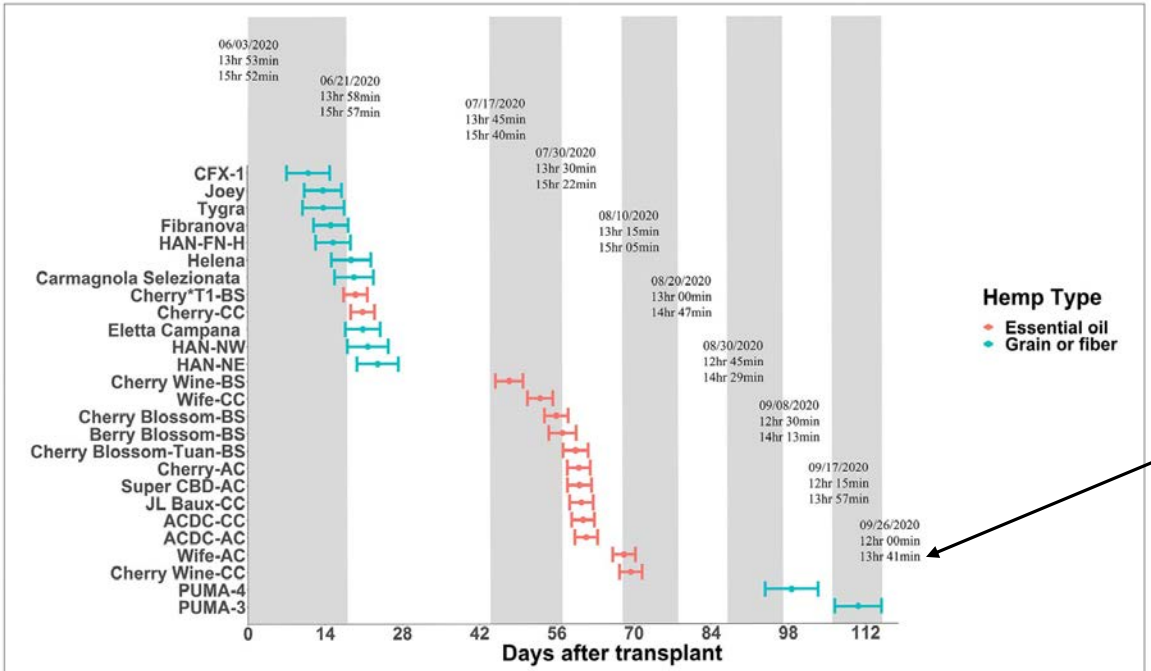
Dates by Flower Development



Civil Twilight

FIGURE 1 | Flowering date of essential oil, grain, and fiber cultivars after transplanting from greenhouse to field conditions on June 3, 2020. Points depict genetic means, and error bars represent 95% confidence intervals. The floating text depicts dates of 15-min daylength intervals (top), sunrise to sunset daylengths (middle), and civil twilight lengths (bottom).

Zhang, Anderson, Brym, and Pearson, 2021 - https://doi.org/10.3389/fpls.2021.694153

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Source seeds or plant material

Same seed lot…

Brian Pearson

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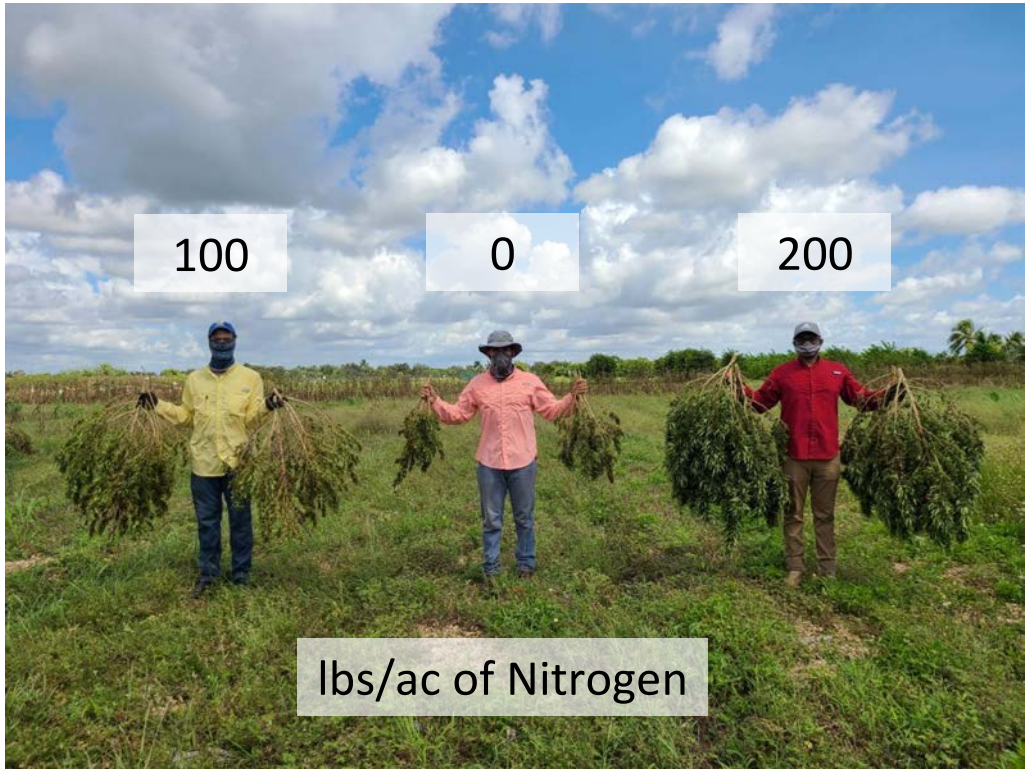
Nitrogen Fertilizer



Anderson, Pearson, et al. - https://doi.org/10.1371/journal.pone.0252985

Luis Monserrate

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Guideline - Best Management Practices

Nitrogen

- Not to exceed 150 lb N / acre
- Less N for fiber
- Split applications

Phosphorous

- Test soil
- Guide: 0 - 125 lb P_2O_5 / acre
- Research: 20 - 70 lb P_2O_5 / acre

Potassium

- Test soil
- Guide: 0 - 120 lb K_2O / acre
- Research: 65 - 120 lb K_2O / acre


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Hemp Fertilization: Current Knowledge, Gaps and Efforts in Florida: A 2020 Report[1]

Rao Mylavarapu, Zachary Brym, Luis Monserrate, and Michael J. Mulvaney[2]

https://edis.ifas.ufl.edu/ss689

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Guideline - Best Management Practices

Nitrogen Research

- Preliminary for nitrogen (< 150 lb N /acre)
- Split applications (50 lb N /acre) best practice
- More does not mean better
- Excess N can delay flowering and cannabinoids
- THC production more genetic than environmental
- Watch out for micronutrient symptoms.


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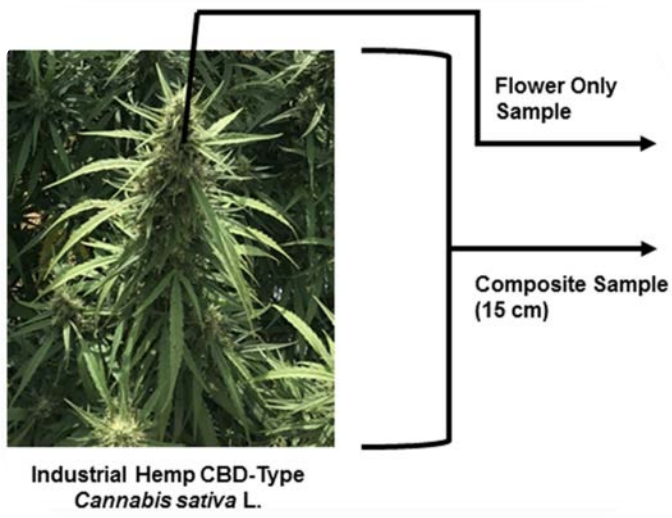
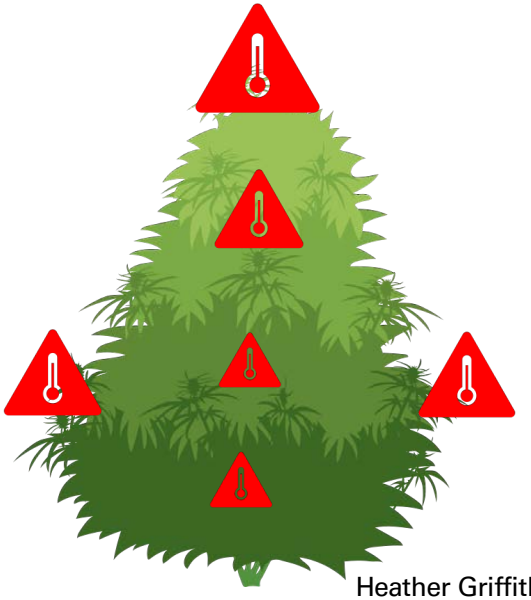
Harvest Testing





Heather Griffith

Berthold, Yang, et al., 2020 - https://doi.org/10.1186/s42238-020-00050-0

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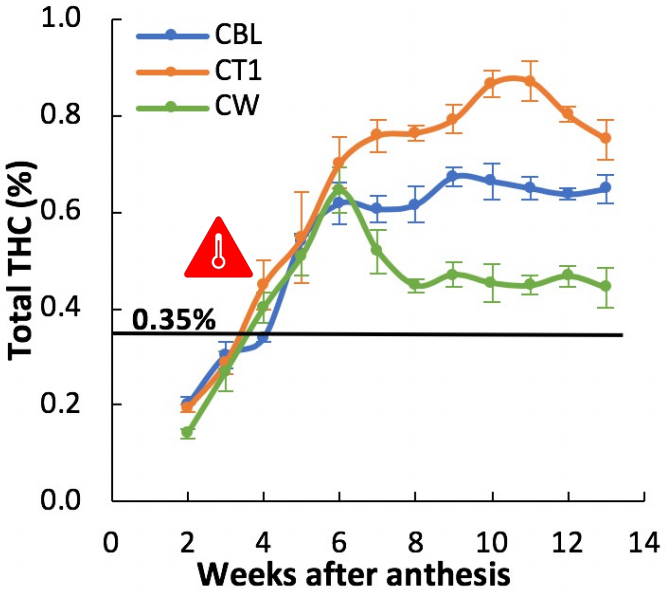
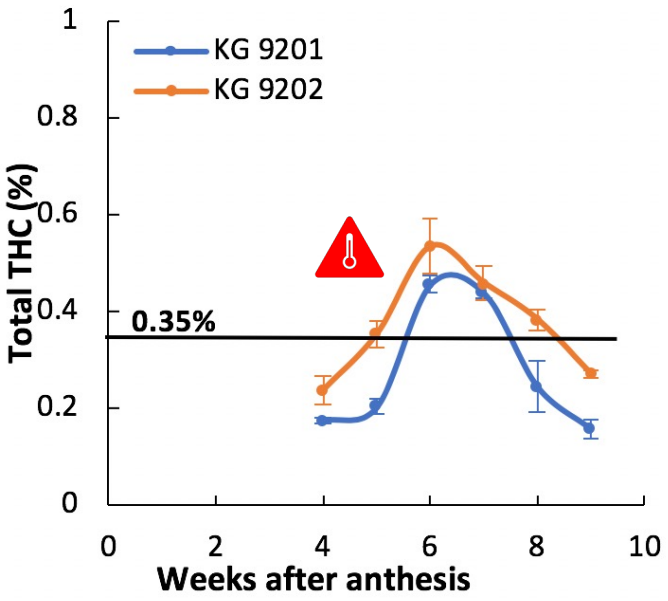
Harvest Timing

> 0.3% total THC





Yang, Bethold, McCurdy, Benevenute, Brym, and Freeman, 2020 - https://dx.doi.org/10.1021/acs.jafc.0c01211

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Get to work!

Hemp Farming Plan

Project Name:			**Date Created / Revised:**	
FDACS Hemp License Number:				
Production Market:	Fiber Seed Flower Other			
Land Prep Date:	**Planting Date:**		**Harvest Date:**	
Personnel:				
Land Preparation:	Row Spacing? in____ x between____		Buffers?	Installation materials?
Planting:	Source?	Rate?	Placement?	Equipment?
Irrigation:	Source?	Rate?	Placement?	Equipment?
Fertilizer:	Source?	Rate?	Placement?	Equipment?
Protection:	Source?	Rate?	Placement?	Equipment?
Harvest:	Testing?	Timing?	Method?	Processing?

Monitoring: (e.g., weather, plant health, pests)

Personnel and Equipment Maintenance:

Long-term Maintenance: (e.g., rotation, climate, surrounding land/neighbors)

What happens next?

What could possibly go wrong?

Farm map and plan (on back)

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INDUSTRIAL HEMP PROGRAM

Burning Questions from the Chat

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INDUSTRIAL HEMP PROGRAM

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