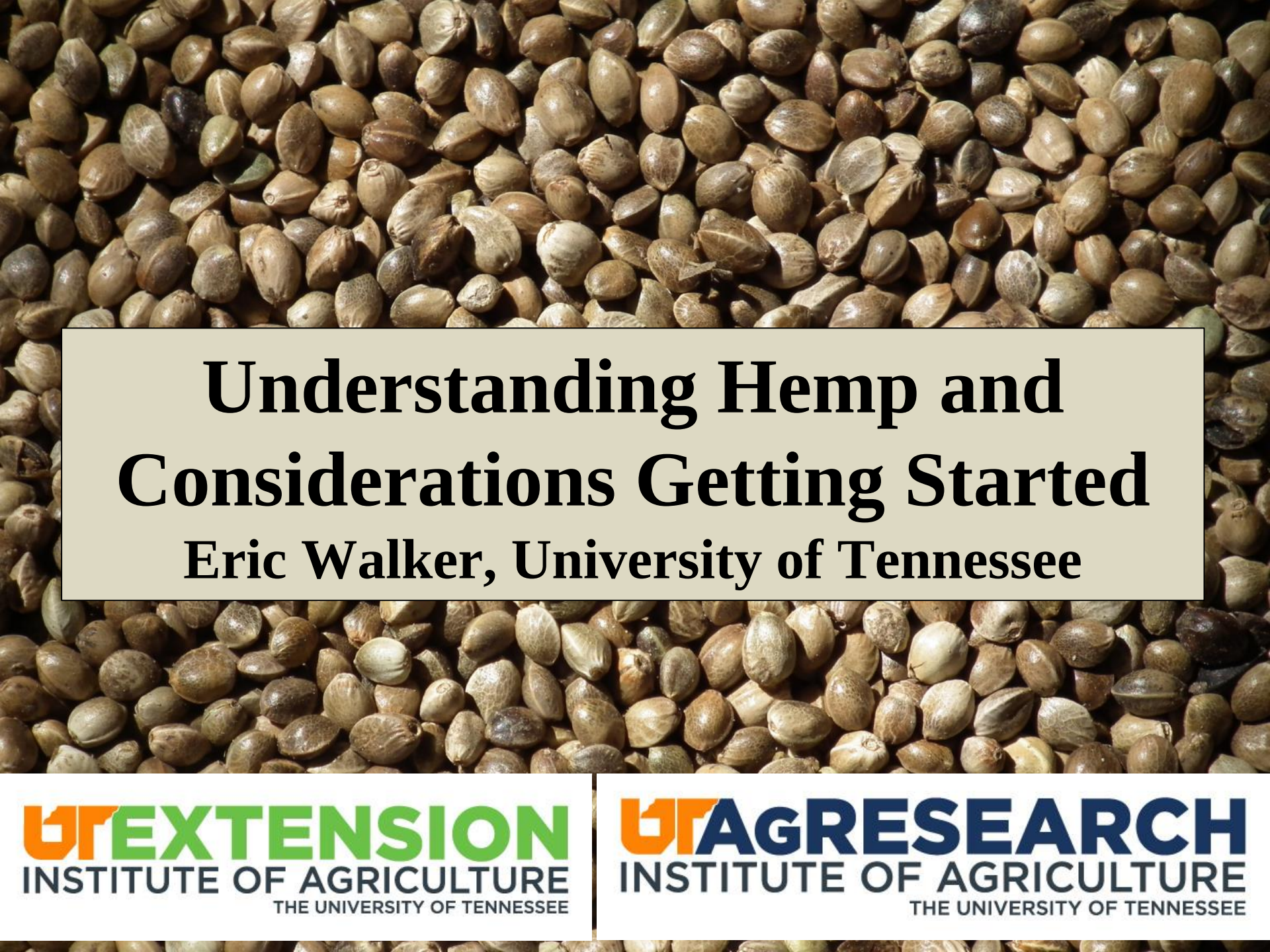

Understanding Hemp and Considerations Getting Started

Eric Walker, University of Tennessee

UTEXTENSION
INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF TENNESSEE

UTAGRESEARCH
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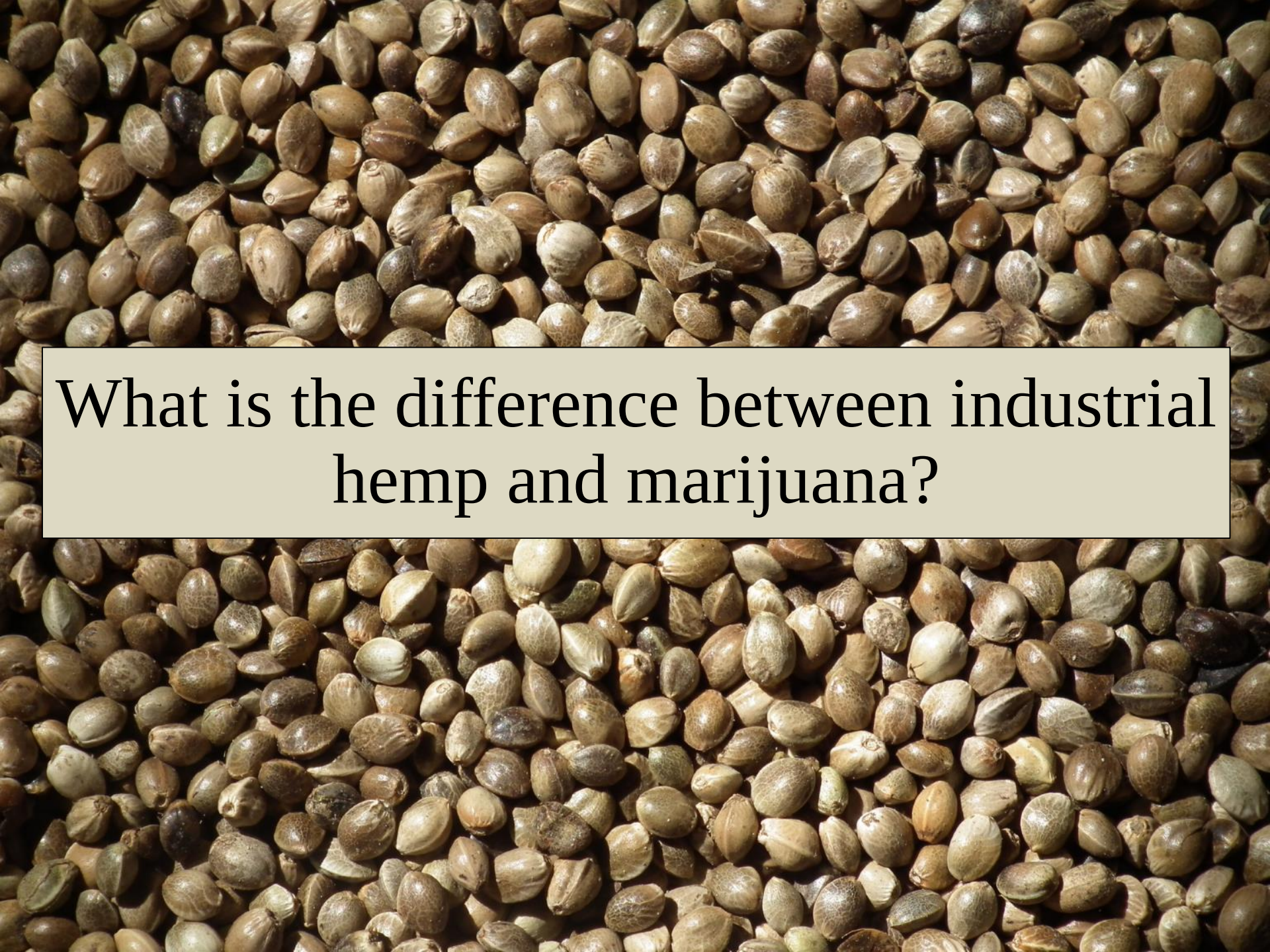
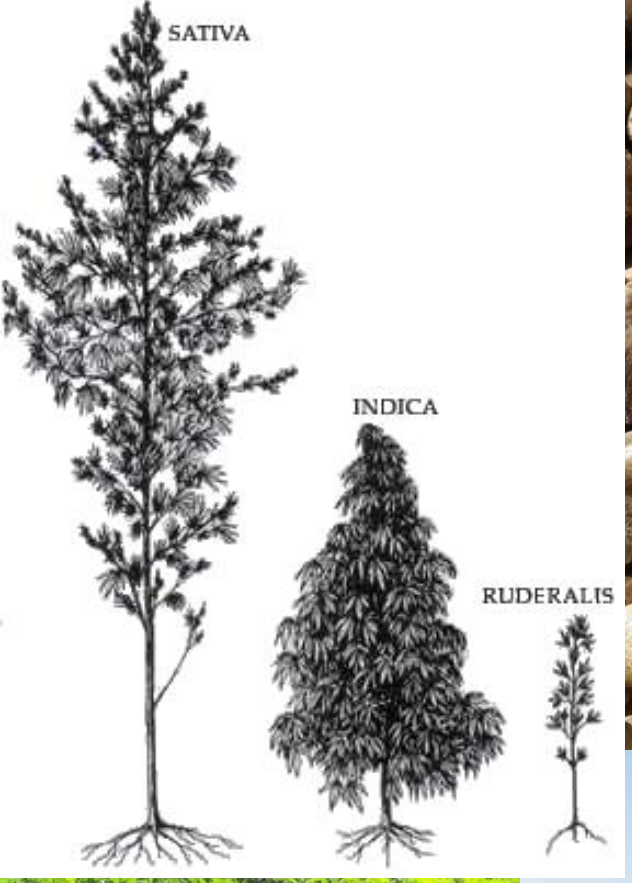
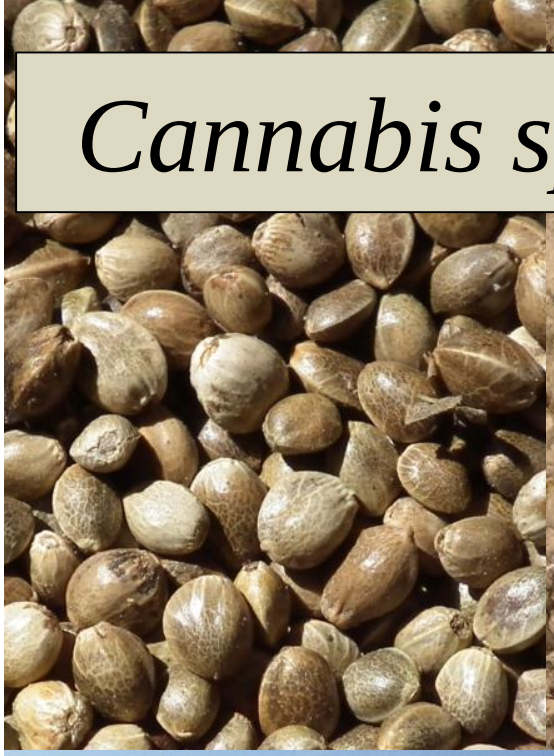
THE UNIVERSITY OF TENNESSEE



What is the difference between industrial hemp and marijuana?

Cannabis sp.





Marijuana vs. industrial hemp

Marijuana

- *Cannabis sativa*
  - *Cannabis indica*, hybrids
- **High THC**
  - **3-30%**
- CBD, other cannabinoids
- Smoke, vape, edibles, oil
- Recreational vs. medical

Industrial hemp

- *Cannabis sativa*
- **Low THC**
  - **< 0.3%**
- CBD, other cannabinoids
- Non-psychoactive
- Many uses


FEDERAL RESERVE NOTE
10
THE UNITED STATES OF AMERICA
WILL PAY TO THE BEARER ON DEMAND
AUTHORIZED BY FEDERAL RESERVE ACT OF DECEMBER 23, 1913
J1136849A
10-J
10-J J1136849A
JACKSON
Washington D.C.
TEN DOLLARS
FEDERAL RESERVE NOTE


TEN DOLLARS
FEDERAL RESERVE NOTE
10
TEN DOLLARS
THIS NOTE IS RECEIVABLE BY ALL NATIONAL AND MEMBER BANKS AND FEDERAL RESERVE BANKS AND FOR ALL TAXES, CUSTOMS AND OTHER PUBLIC DUES. IT IS REDEEMABLE IN GOLD ON DEMAND AT THE TREASURY DEPARTMENT OF THE UNITED STATES, IN THE CITY OF WASHINGTON, DISTRICT OF COLUMBIA, OR IN GOLD OR LAWFUL MONEY AT ANY FEDERAL RESERVE BANK.

TABLE 355.—*Hemp fiber and hemp seed: Acreage, yield, and production, United States, 1931–43*

Year	Hemp fiber			Hemp seed		
	Acreage harvested	Yield per acre	Production	Acreage harvested	Yield per acre	Production
	Acres	*Pounds*	*1,000 pounds*	*Acres*	*Pounds*	*1,000 pounds*
1931	320	850	272	.....	.....	.....
1932	200	800	160	.....	.....	.....
1933	140	750	105	.....	.....	.....
1934	500	850	425	.....	.....	.....
1935	700	875	612	.....	.....	.....
1936	1,400	725	1,015	.....	.....	.....
1937	1,300	800	1,040	.....	.....	.....
1938	1,390	896	1,246	40	540	22
1939	1,440	890	1,282	210	330	69
1940	2,070	804	1,665	510	725	370
1941	7,400	1,001	7,410	2,200	310	682
1942	14,500	960	13,922	29,300	364	10,660
1943 [1]	145,900	920	134,251	40,500	396	16,055

[1] Preliminary; based largely on records of War Hemp Industries, Inc.
Bureau of Agricultural Economics.

TABLE 356.—*Hemp fiber and hemp seed: Acreage, yield, and production, by States, average 1938–41, annual 1942 and 1943*

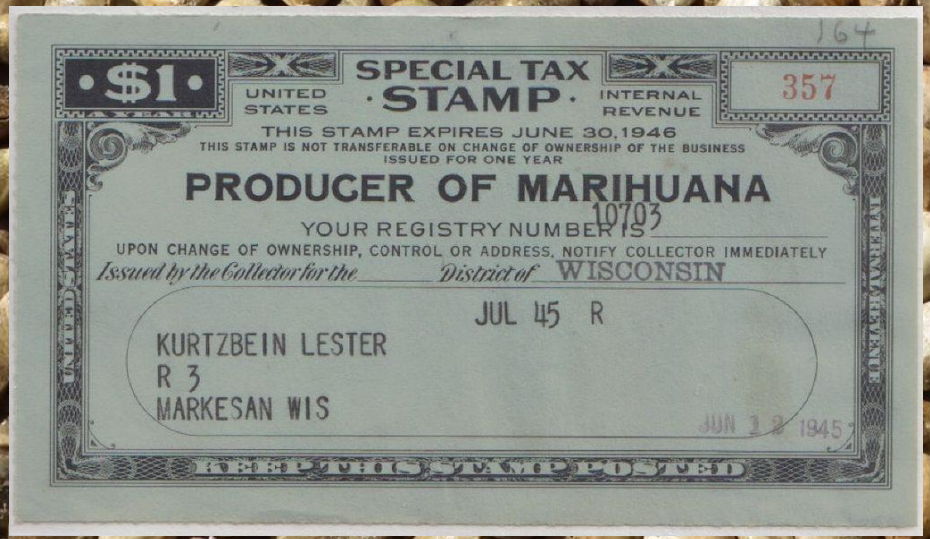
HEMP FIBER

State	Acreage planted		Acreage harvested			Yield per harvested acre			Production		
	1942	1943 [1]	Average 1938–41	1942	1943 [1]	Average 1938–41	1942	1943 [1]	Average 1938–41	1942	1943 [1]
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Pounds*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Indiana	.....	7,600	.....	.....	5,700	.....	.....	930	.....	.....	5,301
Illinois	600	43,000	.....	600	37,000	.....	450	920	.....	270	34,040
Wisconsin	7,400	32,000	2,250	7,000	29,000	895	1,000	970	2,149	7,000	28,130
Minnesota	500	46,000	.....	400	30,000	.....	380	900	.....	152	27,000
Iowa	.....	45,000	.....	.....	40,000	.....	.....	900	.....	.....	36,000
Kentucky	6,700	4,400	825	6,500	4,200	898	1,000	900	752	6,500	3,780
United States	15,200	178,000	3,075	14,500	145,900	898	960	920	2,901	13,922	134,251

HEMP SEED

Kentucky	36,000	47,000	740	29,000	40,000	431	365	396	286	10,585	15,840
Tennessee	300	700	.....	300	500	.....	250	430	.....	75	215
United States	36,300	47,700	.....	29,300	40,500	.....	364	396	.....	10,660	16,055

[1] Preliminary; based largely on records of War Hemp Industries, Inc.
Bureau of Agricultural Economics.



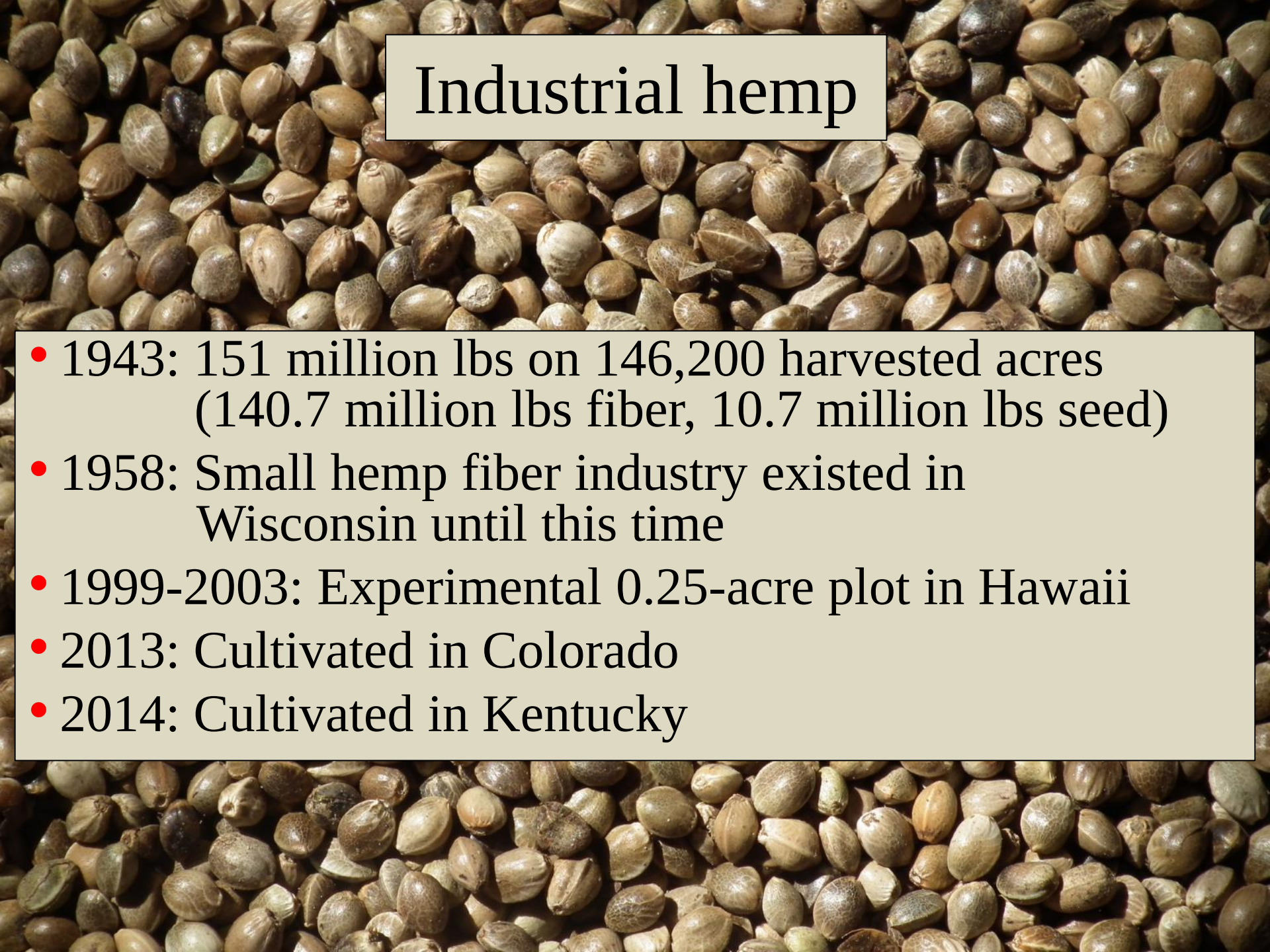
https://www.youtube.com/watch?v=W0xHCkOnn-A

TABLE 98.—*Hemp fiber and hempseed: Acreage, yield, and production, United States, 1939–54*

Year	Hemp fiber [1]			Hempseed [2]			Year	Hemp fiber [1]			Hempseed [2]		
	Acreage harvested	Yield per acre	Production	Acreage harvested	Yield per acre	Production		Acreage harvested	Yield per acre	Production	Acreage harvested	Yield per acre	Production
	Acres	*Lb.*	*1,000 lb.*	*Acres*	*Lb.*	*1,000 lb.*		*Acres*	*Lb.*	*1,000 lb.*	*Acres*	*Lb.*	*1,000 lb.*
1939	1,440	890	1,282	210	330	69	1947	4,900	950	4,655	600	485	291
1940	2,070	804	1,665	510	725	370	1948	2,800	905	2,534	400	440	176
1941	7,400	1,001	7,410	2,200	310	682	1949	4,500	1,100	4,950	200	440	88
1942	14,500	960	13,922	29,300	364	10,660	1950 [3]						
1943	146,200	962	140,680	40,500	346	14,015	1951	1,000	1,100	1,100	140	550	77
1944	53,400	967	51,632	1,200	440	528	1952 [4]						
1945	6,900	980	6,762	800	350	280	1953 [4]						
1946	4,600	975	4,485	400	530	212	1954 [4]						

[1] Wisconsin, 1939–54; Kentucky, 1939–44; Illinois and Minnesota, 1942–44; Iowa, 1943 and 1944; Indiana 1943.
[2] Kentucky, 1939–54; Tennessee, 1942 and 1943.
[3] No production of record.
[4] Not available.

Agricultural Marketing Service. Data for 1931–38 in Agricultural Statistics, 1952, table 111.



Industrial hemp

- 1943: 151 million lbs on 146,200 harvested acres (140.7 million lbs fiber, 10.7 million lbs seed)
- 1958: Small hemp fiber industry existed in Wisconsin until this time
- 1999-2003: Experimental 0.25-acre plot in Hawaii
- 2013: Cultivated in Colorado
- 2014: Cultivated in Kentucky

Sections 7408 and 7409 of the Food, Conservation, and Energy Act of 2008 (Public Law 110–246; 122 Stat. 2013) are both amended by striking "Title III of the Department of Agriculture Reorganization Act of 1994" and inserting "Title III of the Federal Crop Insurance Reform and Department of Agriculture Reorganization Act of 1994".

SEC. 7606. LEGITIMACY OF INDUSTRIAL HEMP RESEARCH.

(a) IN GENERAL.—Notwithstanding the Controlled Substances Act (21 U.S.C. 801 et seq.), the Safe and Drug-Free Schools and Communities Act (20 U.S.C. 7101 et seq.), chapter 81 of title 41, United States Code, or any other Federal law, an institution of higher education (as defined in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001)) or a State department of agriculture may grow or cultivate industrial hemp if—

(1) the industrial hemp is grown or cultivated for purposes of research conducted under an agricultural pilot program or other agricultural or academic research; and

(2) the growing or cultivating of industrial hemp is allowed under the laws of the State in which such institution of higher education or State department of agriculture is located and such research occurs.

(b) DEFINITIONS.—In this section:

(1) AGRICULTURAL PILOT PROGRAM.—The term "agricultural pilot program" means a pilot program to study the growth, cultivation, or marketing of industrial hemp—

(A) in States that permit the growth or cultivation of industrial hemp under the laws of the State; and

(B) in a manner that—

(i) ensures that only institutions of higher education and State departments of agriculture are used to grow or cultivate industrial hemp;

(ii) requires that sites used for growing or cultivating industrial hemp in a State be certified by, and registered with, the State department of agriculture; and

(iii) authorizes State departments of agriculture to promulgate regulations to carry out the pilot program in the States in accordance with the purposes of this section.

(2) INDUSTRIAL HEMP.—The term "industrial hemp" means the plant Cannabis sativa L. and any part of such plant, whether growing or not, with a delta-9 tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis.

(3) STATE DEPARTMENT OF AGRICULTURE.—The term "State department of agriculture" means the agency, commission, or department of a State government responsible for agriculture within the State.

TITLE VIII—FORESTRY

Subtitle A—Repeal of Certain Forestry Programs

SEC. 8001. FOREST LAND ENHANCEMENT PROGRAM.

(a) REPEAL.—Section 4 of the Cooperative Forestry Assistance Act of 1978 (16 U.S.C. 2103) is repealed.

(b) CONFORMING AMENDMENT.—Section 8002 of the Farm Secu-


LEGRAND

ATALO HOLDINGS' 27 ACRES OF CANNABINOID-RICH HEMP PLANTS IN WINCHESTER, KY.

http://bittersoutherner.com/kentucky-hemp#.Vl8w-dA46-T

Photo by Elaine McMillion Sheldon

CBD

- CBD = cannabidiol
  - cannabinoid found in *Cannabis* sp.
  - Non-psychoactive/non-psychotropic
  - Medicinal properties reported: epilepsy/seizures, Alzheimer disease, Parkinson disease, Huntington disease, amyotrophic lateral sclerosis (ALS), multiple sclerosis (MS), anti-inflammatory, antioxidant
  - Initially hard to find sound information on the benefits, drawbacks, and actual efficacy of CBD as a medicine – getting better
  - Economic potential; developing and expanding market – how long?
  - Lacks regulation
  - CBD (and other cannabinoids) contained in *Cannabis* resin


2014-2017

2018: TN allows noncertified hemp genetics

Industrial hemp production basics

- For field, tobacco, tomato production models
- Soil test – fertility, heavy metals, pesticides
- Population 800-2700 plants (1000-1500)
- Fertile, well-drained soil (less weeds the better)
- Tobacco fertility program works
- Tobacco labor, if not more
- Weeds, insect, disease challenges
- Hand-harvest for most
- Need dry area to dry plants
- Strip plants for flowers, leaves
- Proper storage
- Profit potential can be similar to tobacco*

- Accept risks.
  - Production and marketing of established crops have high risks; production and marketing of new crops have higher risks.

- Accept risks.
- Define your goals.
  - Fiber, seed, cannabinoids (CBD)?
  - Organic or conventional?
    (UT Extension Publication W 215)
  - Learn, profit?

- Accept risks.
- Define your goals.
- Educate yourself objectively.
  - Lots of information
  - Lots of passion, emotion tied to *Cannabis*
  - Needs, costs, profit potential
  - Be realistic and rational (scrutinize)

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
  - Land, labor, capital, infrastructure, equipment
  - Site selection – fertile, well-drained, clean, air-flow, accessibility and visibility, pH, fertility program
  - Moderation

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
- Position yourself for success.
  - TN Department of Agriculture
  - TN HIA
  - Network
  - Protect yourself

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
- Position yourself for success.
- Know your goals and capabilities
  - Periodically pause, reorientate

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
- Position yourself for success.
- Know your goals and capabilities
- Secure a market.
  - You will hear lots of different numbers; lean on previous steps
  - Choose a reputable processor/buyer
  - Identify varieties and suppliers
  - Establish a relationship, communicate regularly, and follow through

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
- Position yourself for success.
- Know your goals and capabilities
- Secure a market.
- Get a license.

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
- Position yourself for success.
- Know your goals and capabilities
- Secure a market.
- Get a license.
- Be ready and stay ahead.
  - Things happen fast
  - Be ready to plant (window may be tight)
  - Stay ahead of problems
    - Weeds, insects, diseases will come

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
- Position yourself for success.
- Know your goals and capabilities
- Secure a market.
- Get a license.
- Be ready and stay ahead.
- Be sound.
  - Agronomically, ethically

- Accept risks.
- Define your goals.
- Educate yourself objectively.
- Plan and inventory.
- Position yourself for success.
- Know your goals and capabilities
- Secure a market.
- Get a license.
- Be ready and stay ahead.
- Be sound.
- Follow through.

2019 Questions

- Large increase in producer numbers?
- Shift in producer demographics?
- Clone and seed availability of desired varieties?
- Effects of farm bill on production, current varieties?
- CBD regulation?
- Smokeable market future?
- Will prices hold?
  - Significant hemp production projections in other states
- Opportunities to market crop?
- Funding for research? Research needs?
  - Everything
  - Leading an evolving target