

# Hemp...Is it a silver bullet?

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*2016 Southern Outlook Conference  
Atlanta, GA, September 26-28, 2016*



# What is Hemp?

- Variety of *Cannabis Sativa*
  - Yes it is the same plant species as Marijuana
  - Genetically different by chemical makeup
    - Low THC (delta-9 tetrahydrocannabinol)
      - Less than 0.3%
  - Marijuana 3-15% or higher



## Myth or Truth?

- Industrial hemp requires no fertilizer inputs
  - Myth – Seed think soybeans; Fiber think corn, CBD is unknown
- If I grow hemp it make me ineligible to receive crop insurance for other commodities
  - Myth – USDA has issued a statement that they can participate and are eligible for federal loans, grants, and other programs
- Hemp is considered a Schedule 1
  - Truth – All cannabis varieties are considered schedule 1
- Industrial hemp field can be used to hide marijuana fields
  - Myth – Cross pollination between hemp and marijuana significantly reduces THC levels

# History

- Produced in the U.S. from 1645-1958
- During WWII hemp production peaked
- 1958 last hemp produced in Wisconsin
- Controlled Substance Act 1970
  - Any product including THC is a schedule I
- Agricultural Act of 2014
- 31 States have framework to produce

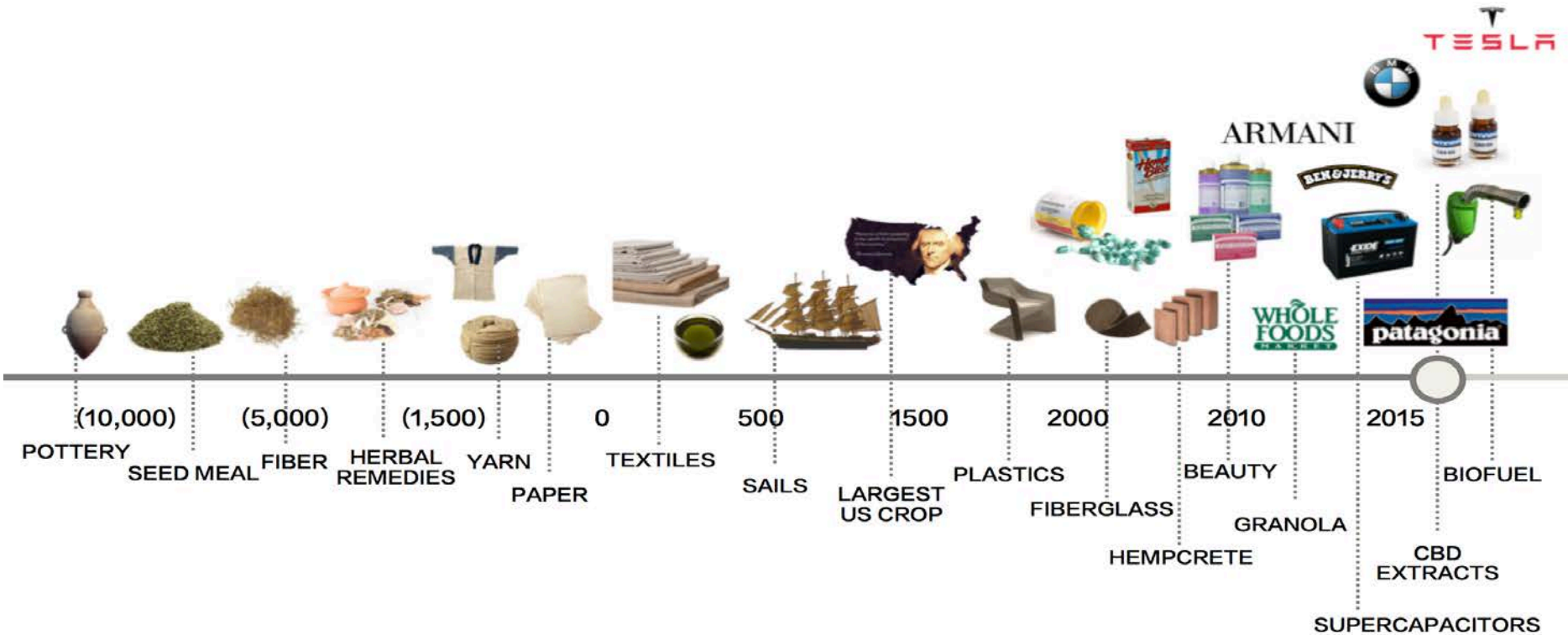


## 25,000+ Potential Products from Hemp

- fabrics and textiles
- yarns and raw or processed spun fibers
- paper
- carpeting
- home furnishings
- construction and insulation materials
- auto parts
- composites
- animal bedding
- foods and beverages
- body care products
- nutritional supplements
- industrial oils
- cosmetics
- personal care
- Pharmaceuticals
- Etc.



# Timeline of Hemp Products





# Outputs and Production Systems

- Seed/Grain

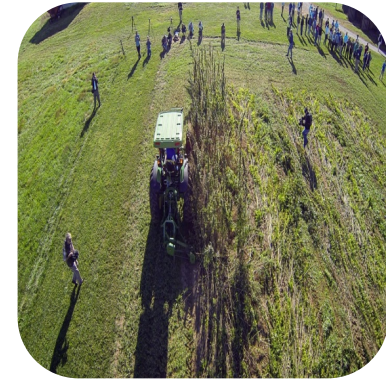
- Soybean System
- Late May-June Plant

- Fiber

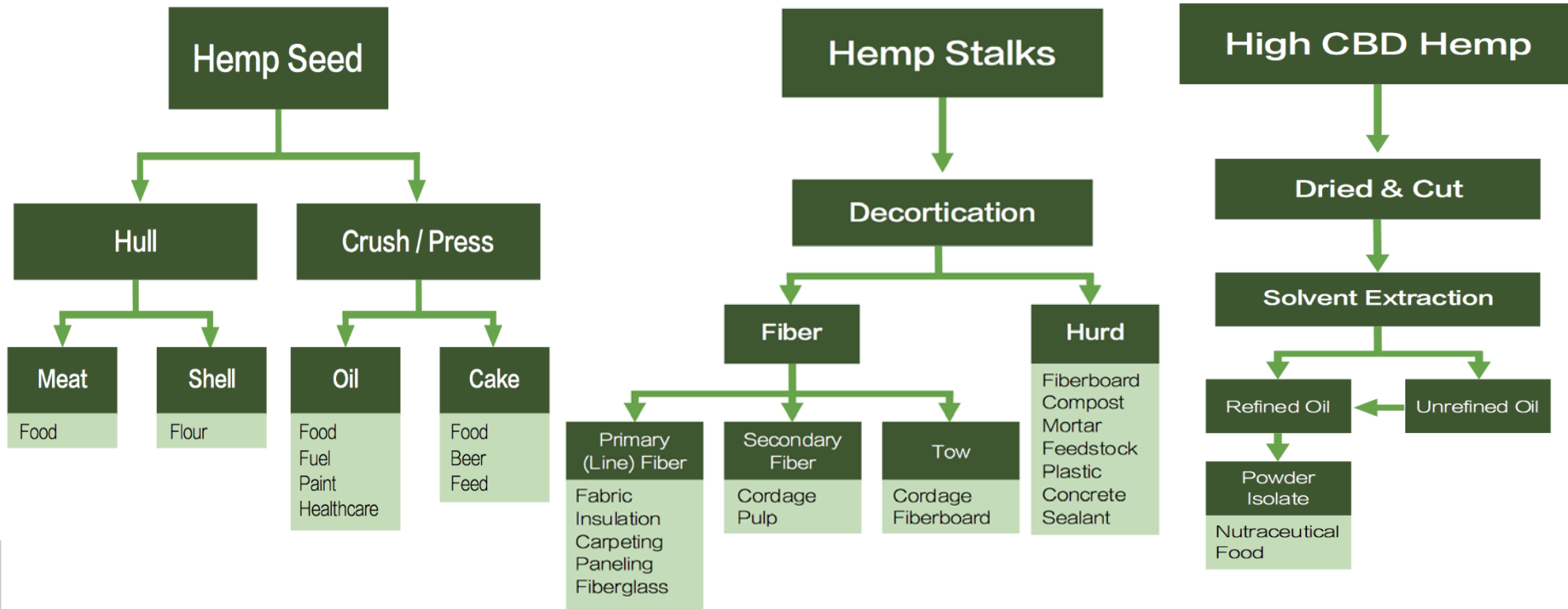
- Hay Production
- Late April-May Plant

- Cannabidiol (CBD)

- Row Crop System
- Vegetable Production System
- Tobacco Production System



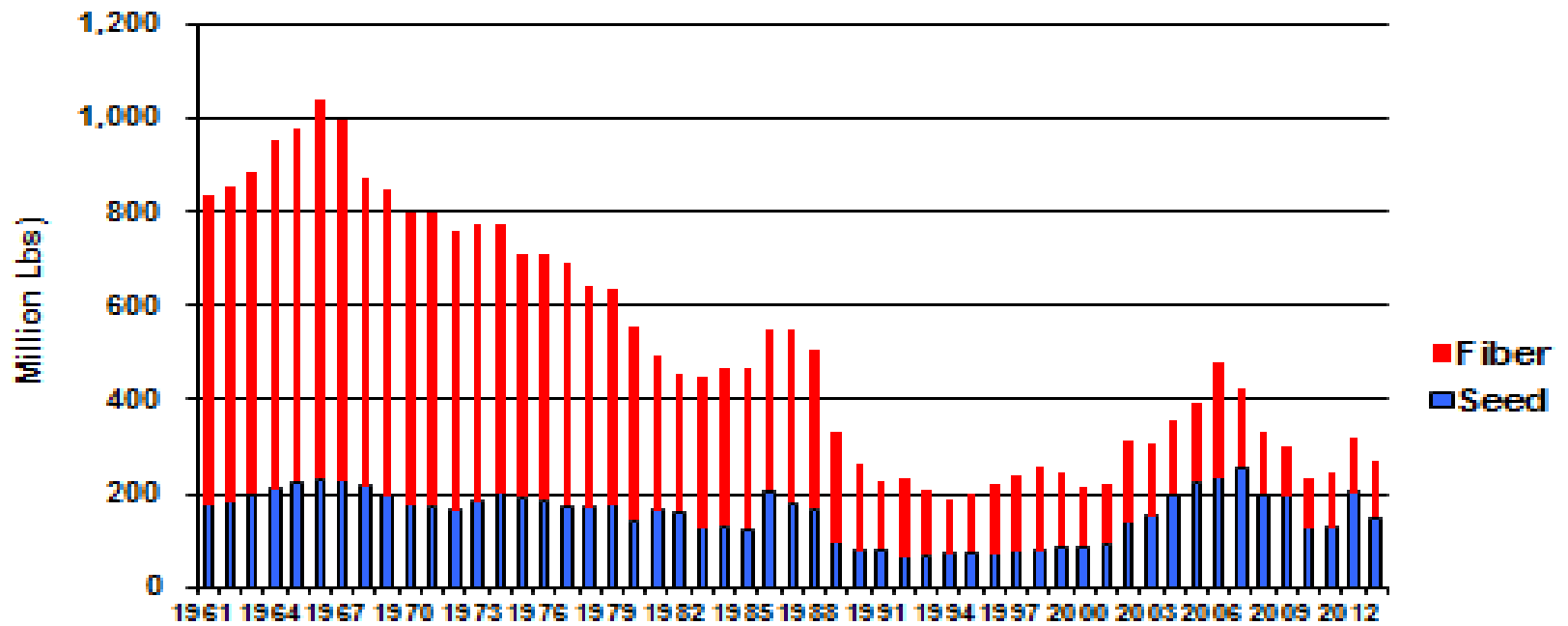
# Breaking Down Each Output





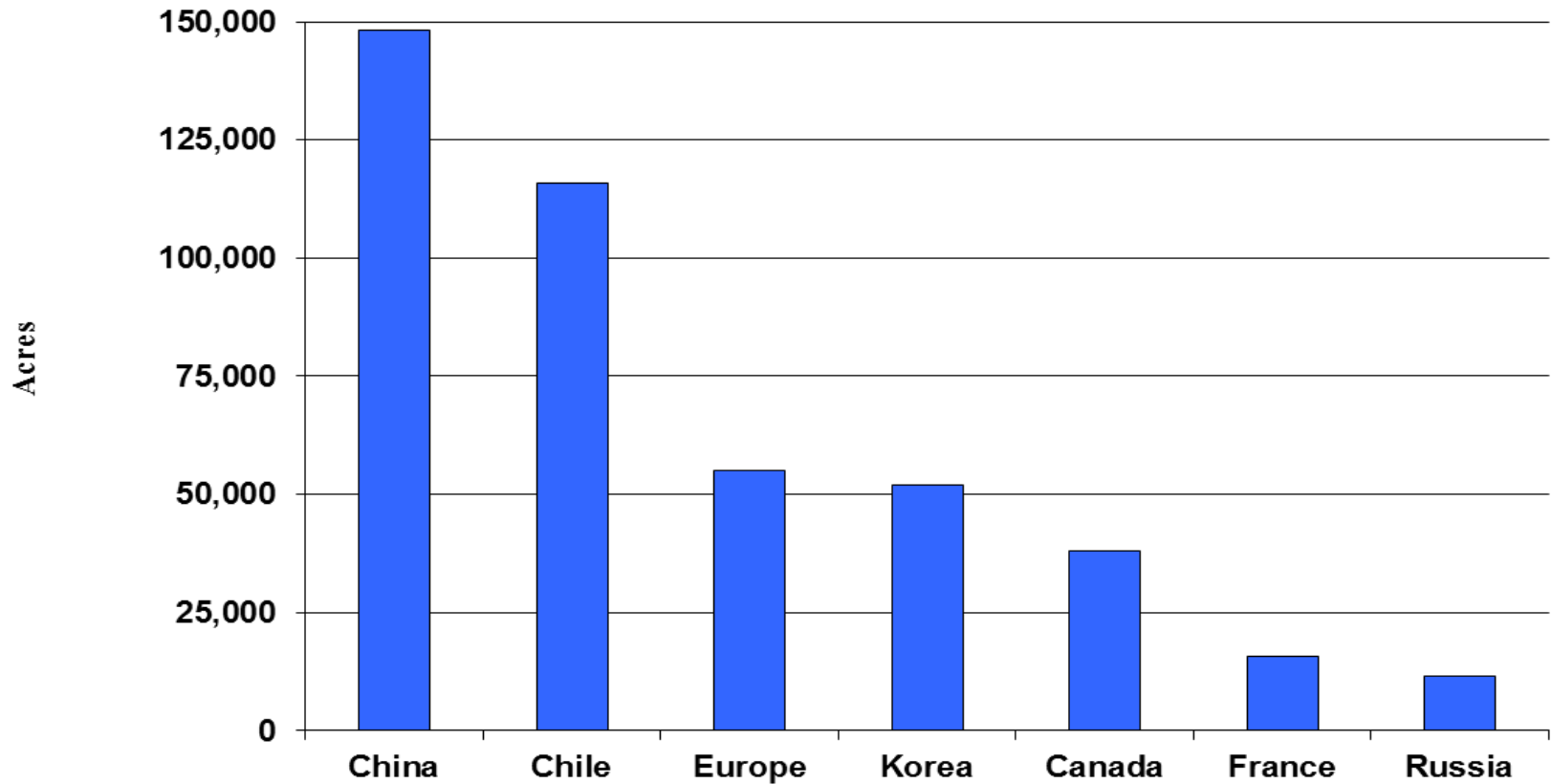
# World Hemp Production

# World Hemp Seed and Fiber Production

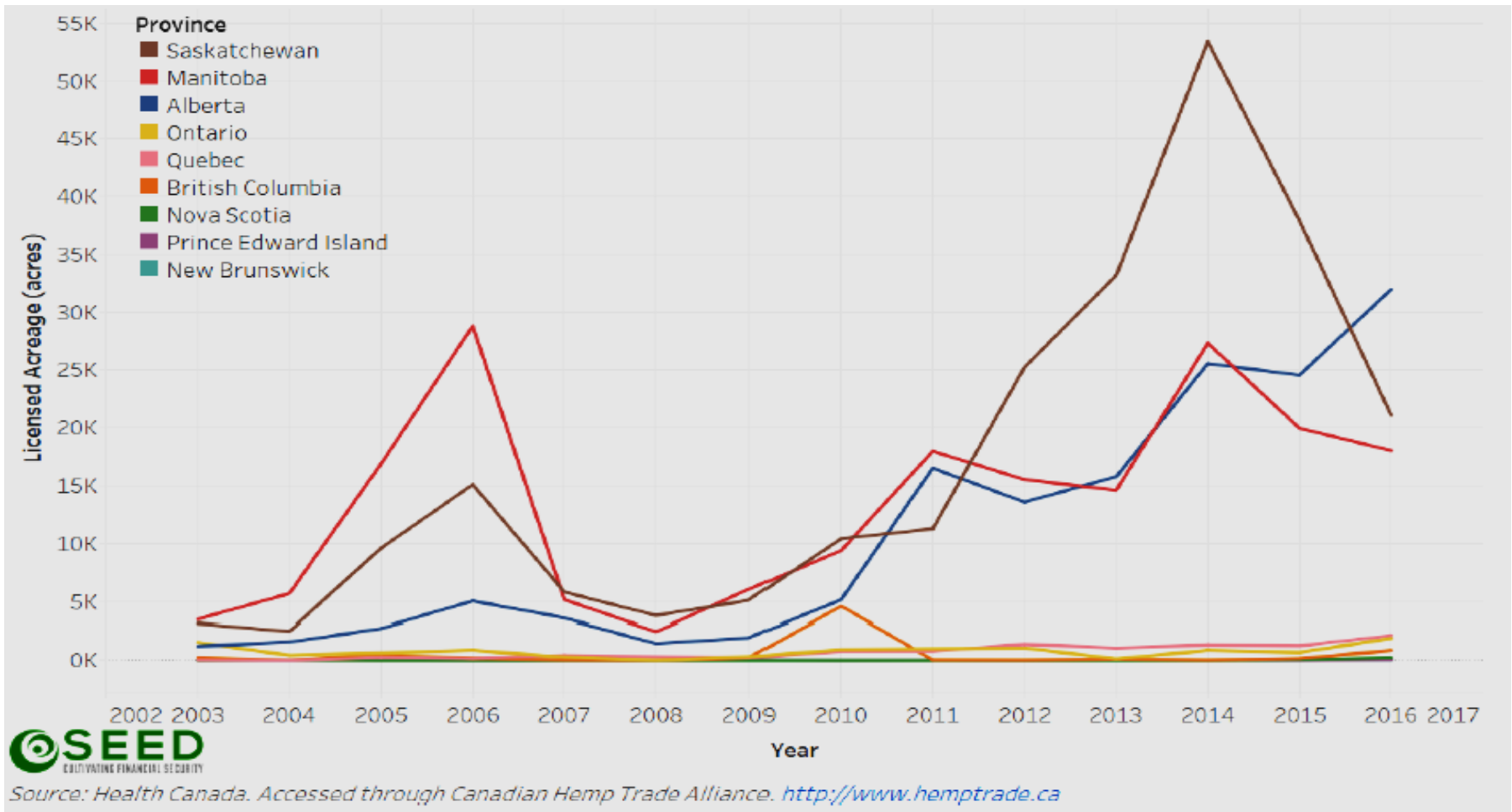


Source: FAO STAT

# 2011 Hemp Acreage for Selected Countries/Regions

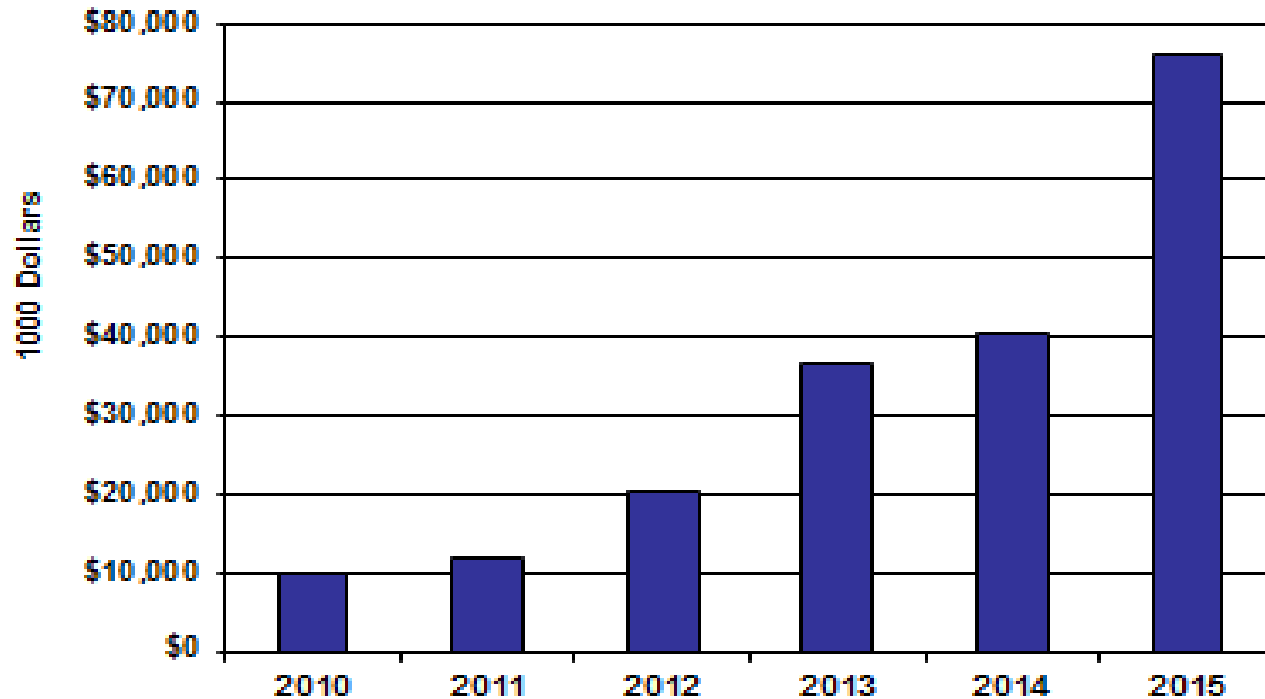


# Canadian Hemp Acreage 2003-2016 (acres) - province



Where are at in the US?

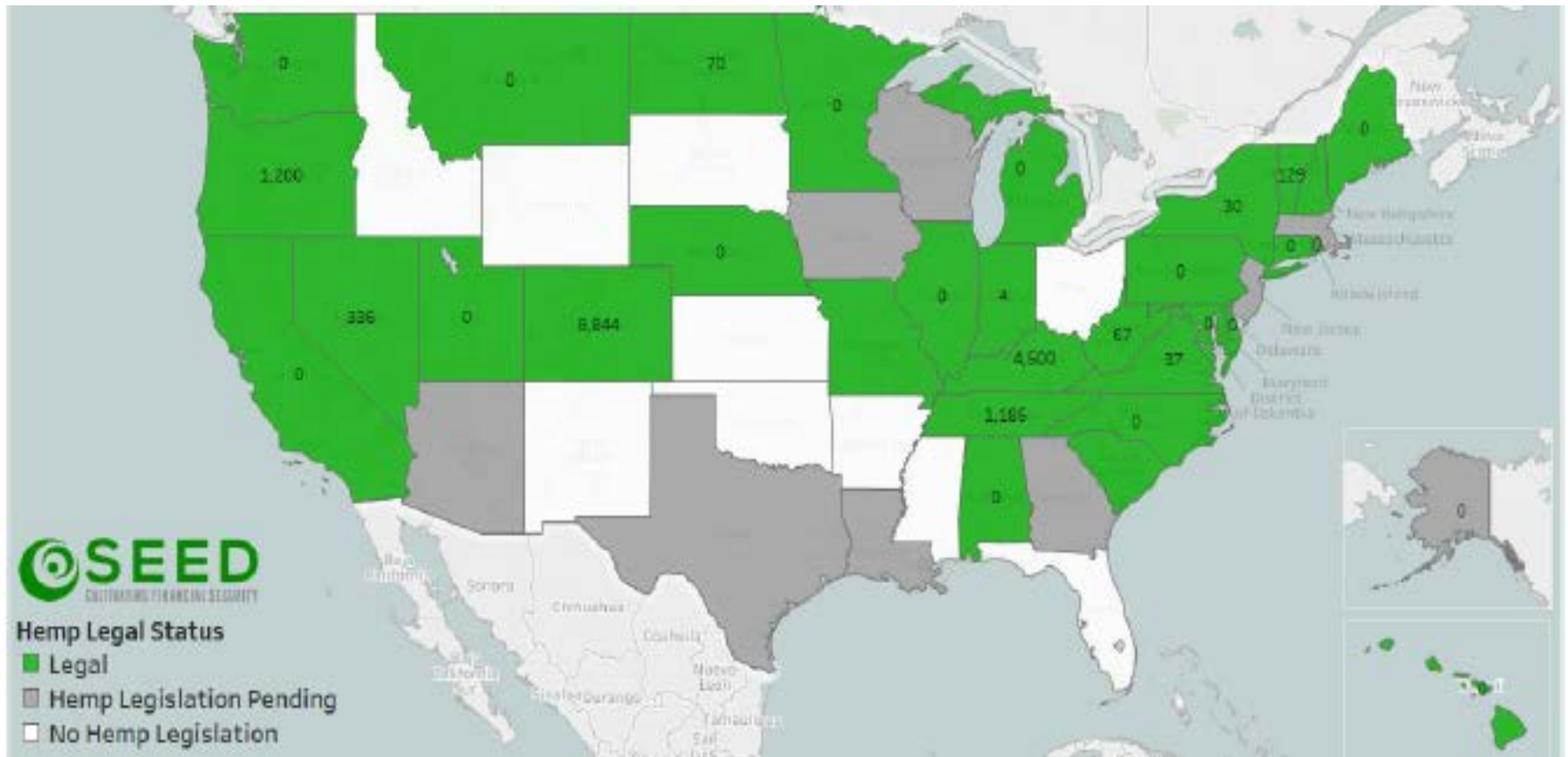
# Value of U.S. Hemp Imports



Source: CRS using data from US International Trade Commission and Global Trade Atlas

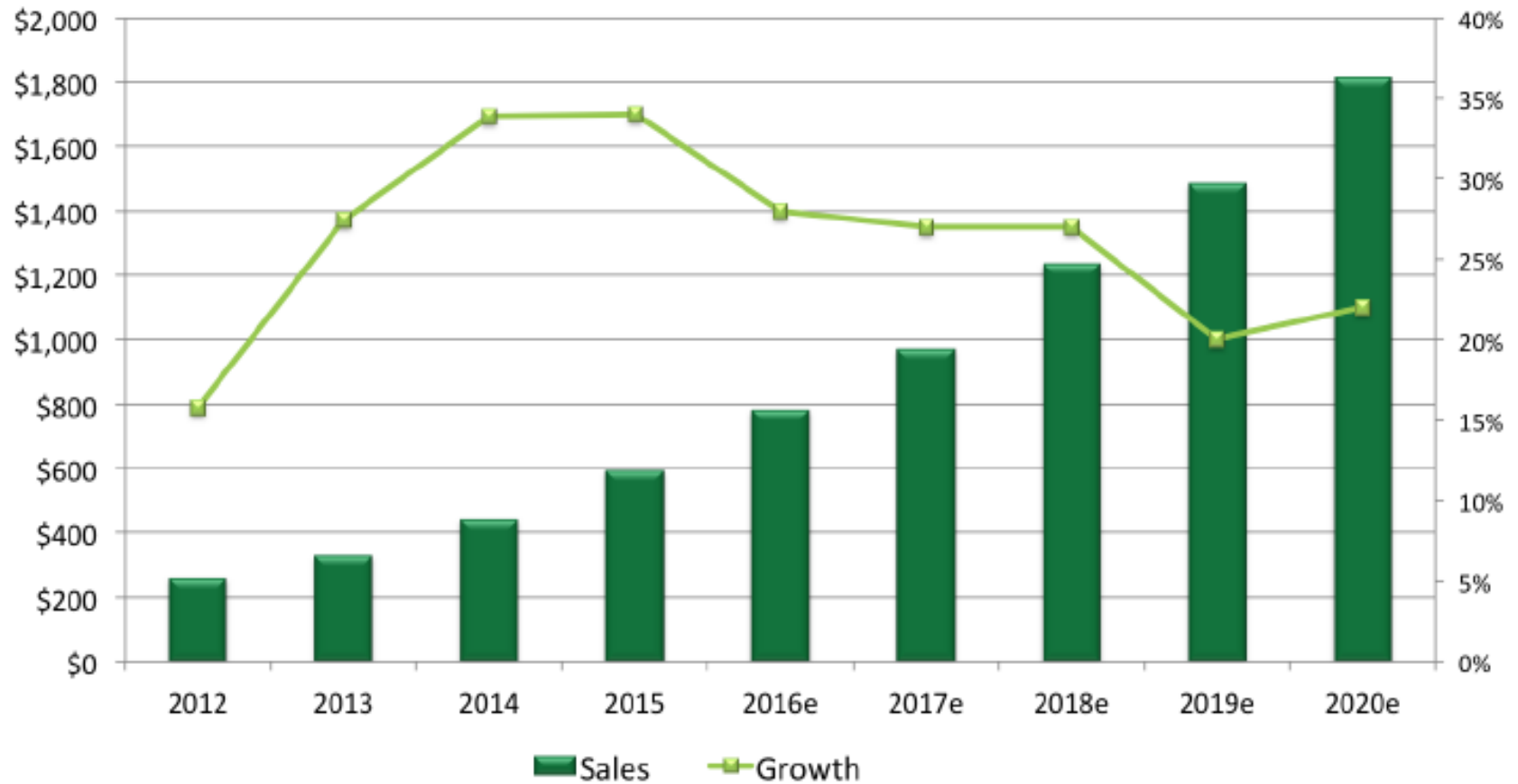


# U.S. Hemp Acreage 2016 – by legal hemp state



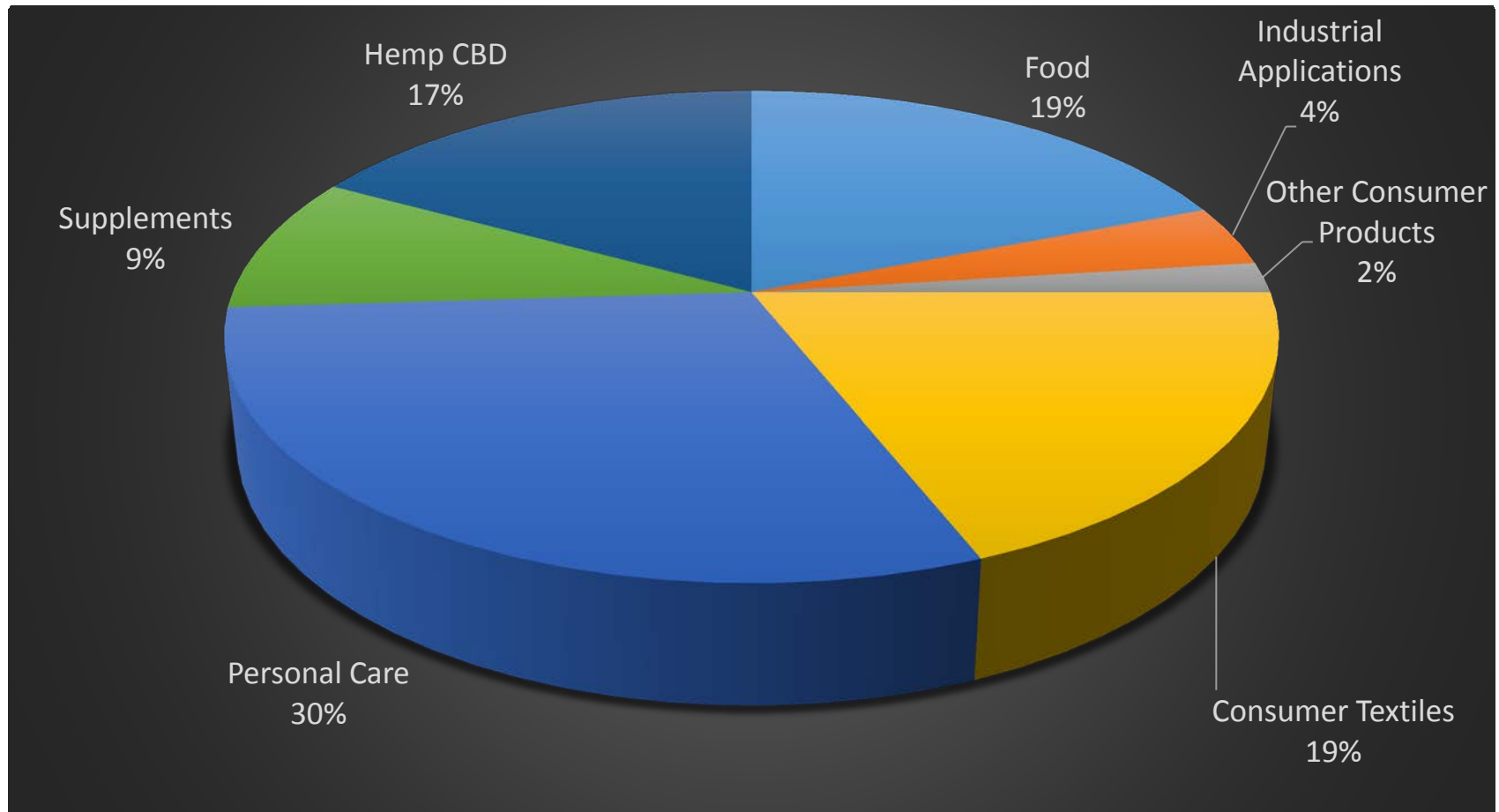
Source: Seed Cultivating Financial Security, State of the U.S. Hemp Production

## U.S. Hemp-Based Products Sales, 2012-2020e

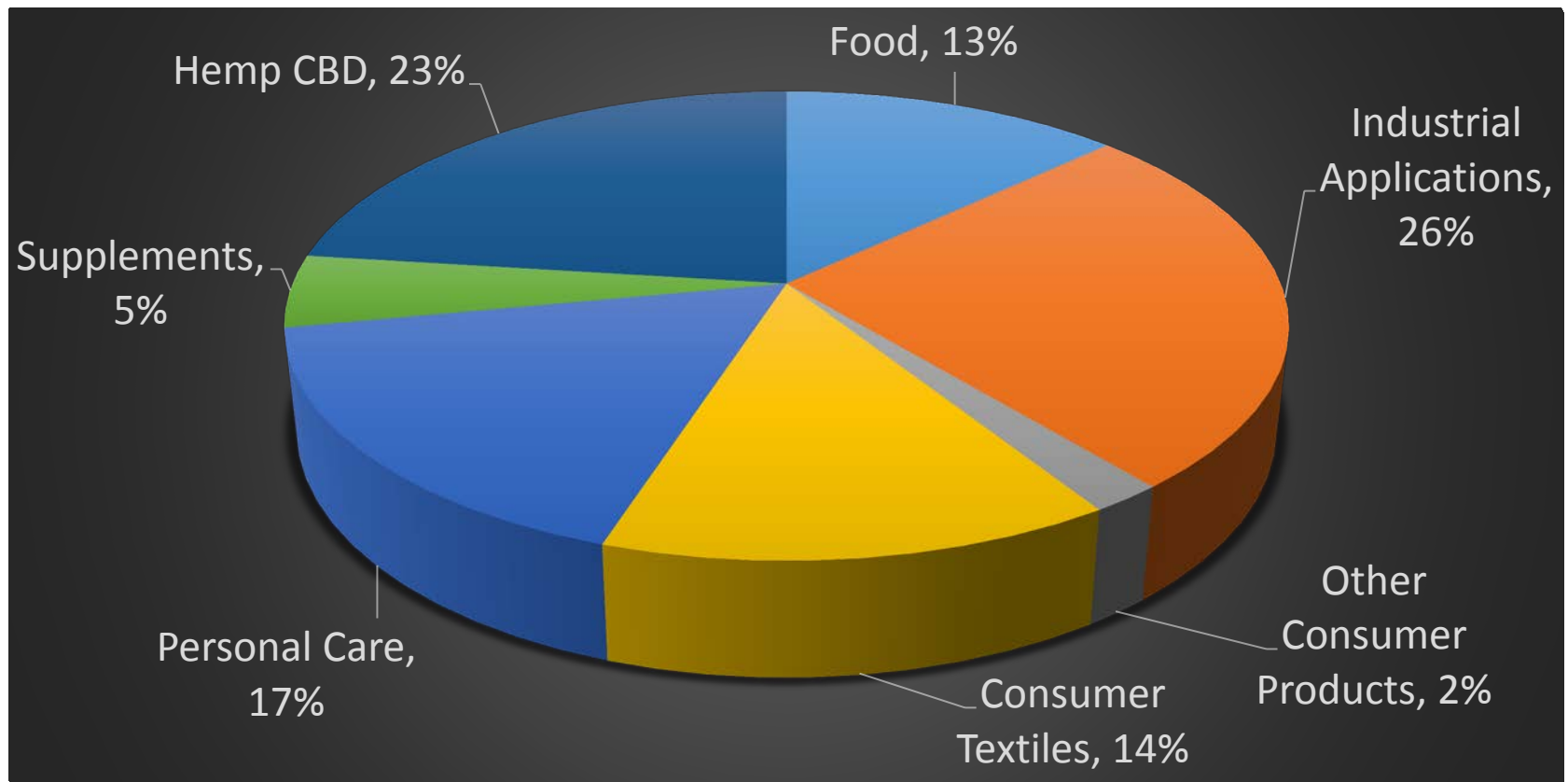


Source: *Hemp Biz Journal* estimates (\$ mil., consumer sales)

# \$500 Million U.S. Hemp-Based Product Sales by Category in 2015e



# \$1.5 Billion U.S. Hemp-Based Product Sales by Category in 2020e



Source: Hemp Business Journal estimates (consumer sales)



43 Days After Seeding

126 Days After Seeding



# Yield and Cost of Production

# Expected Hemp Yields

	Low Productivity (100 bu corn)		Medium-Low Productivity (125 bu corn)		Medium-High Productivity (150 bu corn)		High Productivity (175 bu corn)	
	Fiber Yield Tons/Acre	Seed Yield (lbs)	Fiber Yield Tons/Acre	Seed Yield (lbs)	Fiber Yield Tons/Acre	Seed Yield (lbs)	Fiber Yield Tons/Acre	Seed Yield (lbs)
Fiber Only	<b>4.6</b>		<b>5.8</b>		<b>6.9</b>		<b>8.1</b>	
Dual System	<b>2.2</b>	<b>520</b>	<b>2.8</b>	<b>650</b>	<b>3.3</b>	<b>780</b>	<b>3.9</b>	<b>910</b>
Seed Only		<b>600</b>		<b>750</b>		<b>900</b>		<b>1050</b>

Source: <http://www.uky.edu/Ag/AgriculturalEconomics/pubs/reshempimpfarmer28.pdf>



## Net Returns Fiber Production

Yield Level (tons/year)	\$50/ton Fiber Price	\$75/ton Fiber Price	\$100/ton Fiber Price	\$125/ton Fiber Price
4.0	-\$376	-\$276	-\$176	-\$76
6.0	-\$359	-\$209	-\$59	\$91
8.0	-\$342	-\$142	\$58	\$258
10.0	-\$325	-\$75	\$175	\$425

*Notes: Costs include labor and depreciation/overhead but not land costs. \$3.50/gal fuel; N, P, and K at \$.50/unit; 50 miles one-way trucking to market.*

Source: <http://www.uky.edu/Ag/AgriculturalEconomics/pubs/reshempimpfarmer28.pdf>

## Net Returns Seed Production

Yield Level (lbs/year)	\$.50/lb Seed Price	\$.60/lb Seed Price	\$.70/lb Seed Price	\$.80/lb Seed Price
600	\$11	\$71	\$131	\$191
800	\$102	\$182	\$262	\$342
1000	\$192	\$292	\$392	\$492

*Notes: Costs include labor and depreciation/overhead but not land costs. \$3.50/gal fuel; N, P, and K at \$.50/unit; 50 miles one-way trucking to market.*

Source: <http://www.uky.edu/Ag/AgriculturalEconomics/pubs/reshempimpfarmer28.pdf>

# Net Returns CBD



# Issues to Consider Moving Forward

# Contracts & Storage

- Do they have a contract?
  - What are the terms of the contract?
  - Payment terms
  - Contract structures vary widely
  - Can dictate ability to grow?
    - Kentucky
- Storage is a distant thought to producers
  - 6-12 months of storage
  - Impact on storage of other commodities
  - Different than traditional grain storage
  - Improper storage creates off flavors



## Access to Credit & Risk Management

- Can you get credit
  - Would you lend to a hemp producer?
  - Will lenders even lend to hemp producers?
  - Setting up bank accounts to put hemp money in be problematic
- Lack of risk management tools
  - crop insurance
  - farm programs
  - futures markets...
  - Insurance in general

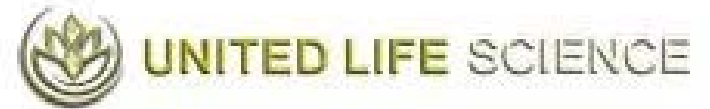




# Legal

- Licensing
- MOUs
- Labeling of herbicide, insecticide and pesticides
- Mixing of industrial hemp, medical marijuana & recreational marijuana
- Organic Certification
- DEA-Statement of Principles on Industrial Hemp
  - August 12, 2016
  - Narrow Congress's definition of "industrial hemp"
    - Only allowing historically proven fiber and seed applications
  - Broadening definition of delta-9 tetrahydrocannabinols (THC)
  - Prohibiting transfers of hemp seeds and plants across state lines

# Processing



COMMONWEALTH EXTRACTS



DR. BRONNER'S  
MAGIC



"ALL-ONE!"

## Resources

- Kentucky Department of Agriculture – Industrial Hemp Program
  - <http://www.kyagr.com/marketing/hemp-pilot.html>
- UK Industrial Hemp Research
  - <http://hemp.ca.uky.edu/>
- Hemp as an Agricultural Commodity
  - <https://www.fas.org/sgp/crs/misc/RL32725.pdf>
- Colorado Industrial Hemp
  - <https://www.colorado.gov/pacific/agplants/industrial-hemp>
- Tennessee Department of Agriculture – Industrial Hemp
  - <https://www.tn.gov/agriculture/topic/ag-farms-industrial-hemp>
- Hemp Industries Associations
  - <https://www.thehia.org/>
- Hemp Biz Journal
  - <http://www.hempbizjournal.com/>

## Who might be the “Winners”

- States who can entice processors/infrastructure to locate in their state based on:
  - a strong research base of knowledge
  - an interested and willing/educated grower pool with lowest cost of production
  - along with potential state financial incentives ... but # of jobs ???
- In the end we have more unknowns than knowns at this point.

## Closing Thoughts

- Estimated Hemp Returns
- Production Challenges
  - Access to credit, seed, and equipment
  - Lack of risk mngt tools such as crop insurance, farm programs, futures markets
  - Competition with other crops/enterprises
- Marketing Challenges
- U.S. and Global Supply Response/Price Volatility
- Where will seed and grain production be?
- Where will fiber be produced?
- Will FDA get involved in CBD?
- Advocacy groups still seem to be driving, but it is slowly changing
- So what about that silver bullet?