

A Hemp Industry for Florida
Lee County Legislative Delegation
October 14, 2015

I am an engineer who built the first hempcrete house in Florida in Tarpon Springs, Florida in 2012, the fourth such house in the nation. Hempcrete is a natural, sustainable building material that reduces carbon, recycles with no landfill requirement and produces healthy, quiet, energy-efficient homes with no sick building syndrome which Florida has spent millions trying to cure. It inhibits interior mold and mildew, resists pests and has a 2-hour fire rating.

Since then, I studied the hemp industry and came to form Florida Hemp Processing, LLC to build a commercial market for Florida farmers growing hemp.

1. Industrial Hemp is defined by the Federal Farm Bill of 2014 as Cannabis Sativa L. with THC content below 3,000 PPM. That bill legalizes state farming research of Industrial Hemp wherever states pass a bill authorizing hemp farming in their state. We are asking your support for an Industrial Hemp Farming bill in Florida. In 2015, SB 902 and HB 363 were introduced to do that.
2. Hemp can be a \$200 Million annual cash crop for Florida's farmers which would rank as our fifth largest crop using only one crop rotation on 5.5% of Florida's farmland with no impact on food production.
3. Hemp can spawn an industry of processing and manufacturing products from hemp generating \$260 million per year for Florida adding over 675 full-time permanent employees. Moreover, these can be jobs for the most difficult segment of the working population: young workers, under-skilled workers, rehabilitated offenders or even the chronically unemployed. Hemp processing does not care about who you are or what you once did. These jobs will reduce Florida's welfare/unemployment burden.
4. Together, farming and processing can add \$460 Million to Florida's annual GDP. Further, it adds a \$425 million investment in factories and equipment to our tax base. Downstream businesses and services will add millions more.
5. Farmers can net \$200-250/acre as opposed to losing money on cover crops. By comparison, soybeans can only net \$75/acre. The average farm in Florida is 195 acres. That injection of capital can upgrade equipment improving the farm yield and efficiency. The added income can save family farms and provide a farming future for their children.
6. We envision hemp as a cover crop between food crop rotations only. We do not envision it supplanting food crops, although hemp seed itself is an excellent source of nutrition added to our food supply.
7. Florida's year-round climate gives us an advantage over other states growing hemp. We can get multiple crops per year. This reduces our inventory costs and gives us a market

leading position, not just nationally, but globally.

8. Hemp is a valuable tool for phytoremediation of contaminated soils. UF-IFAS has documented the remediation problems in the Central Florida Phosphate District (CFPD). One difficult problem is the radioactivity concentrated in the Clay Storage Areas (CSAs). Hemp is being used to remove radioactive Cesium 137 at Chernobyl. Fukushima in Japan is studying hemp for the same purpose. Another problem is simply sterile soils resulting from the clay/sand/gypsum/dolomite mixture used. Hemp has deep roots that stabilize soils. They are left in the ground after harvest to build soil quality. The income from hemp can reduce reclamation costs. See also http://soils.ifas.ufl.edu/docs/pdf/academic/papers/beavers_casey_no_embargo.pdf
9. Hemp makes an excellent buffer to catch farm runoff, and it can be a wind barrier for delicate crops like berries. It has been used as a pollen barrier to protect special cultivars. Hemp roots go 8 feet deep pulling nitrates from the soil to protect our aquifer. It is excellent wherever animal operations produce waste management issues.
10. Hemp makes an excellent cover crop for vegetable farms. It improves the soil and drives out weeds improving food crop yields and reducing costs for the next crop in rotation.
11. Hemp seed is highly nutritious. It has all needed amino acids in good amounts and an omega oil ratio that most closely matches the brain's needs of all other food sources. It is an excellent source of protein. It promotes healing intestinal inflammation. It has a well deserved reputation as a super food.
12. The waste material from processing can be pelletized and fed to biochar kilns making nearly 40,000 tons of biochar a year, enough for 20,000 acres. Biochar builds topsoil, reduces farm runoff and can improve yields 40%.
13. If all the hemp Florida could produce annually were applied to houses made of hempcrete, the energy savings from those 35,000 houses would equal one coal-fired power plant every 15 years.

I urge delegation members to join the 22 other states that have approved hemp legislation and support hemp farming so these benefits can flow to Florida's farmers and citizens.

/s Robert F. Clayton
Florida Hemp Processing, LLC

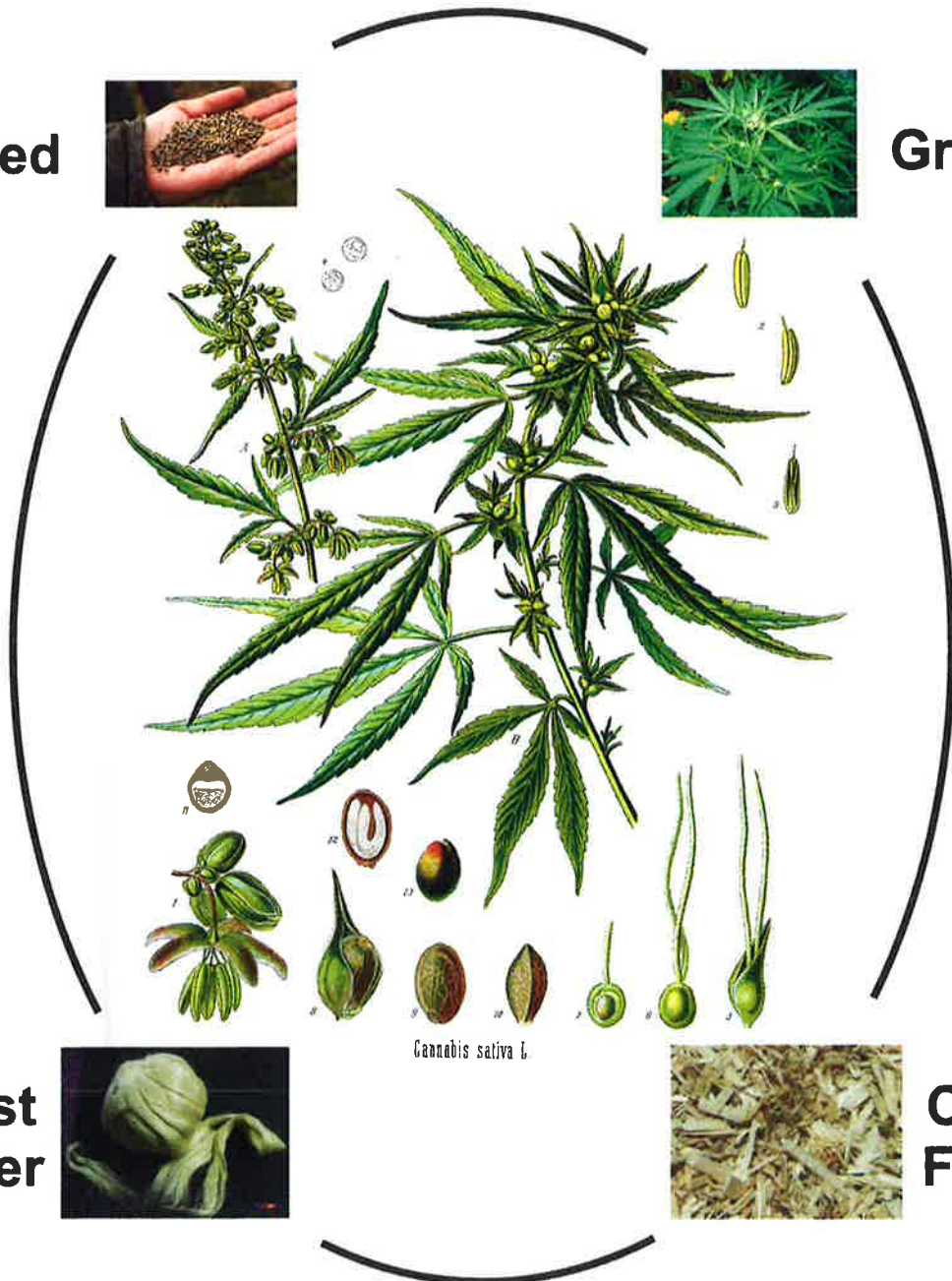
Industrial Hemp is Four Crops

\$580 Million US Market in 2014
22% Market Growth

Seed



Greens



**Bast
Fiber**



**Core
Fiber**



Cannabis sativa L.

24%
240,000
PPM

Hemp vs Marijuana

It's been said that all crows are blackbirds,...



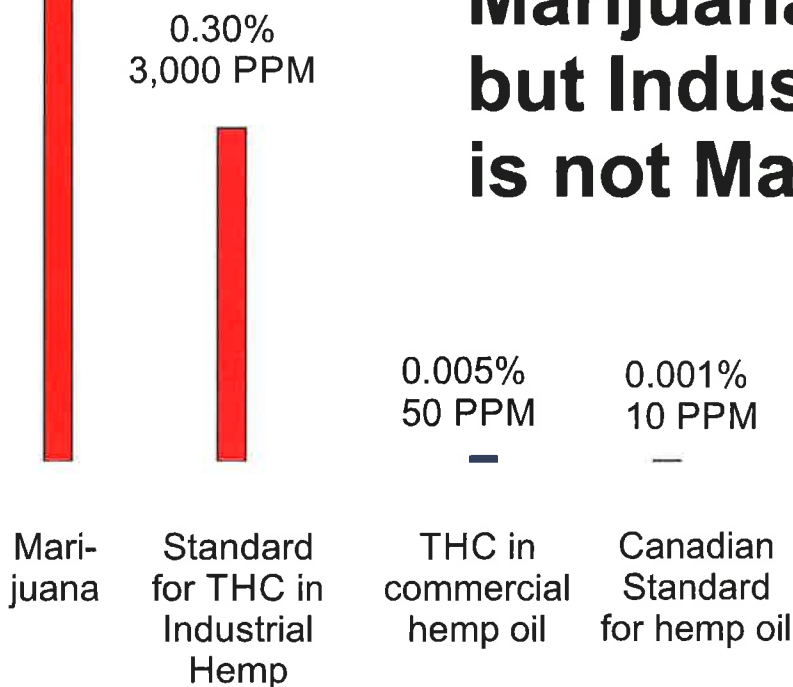
but not all blackbirds are crows.

The same can be said for industrial hemp and its hallucinogenic cousin marijuana.

Marijuana is a man-made cultivar of hemp specifically bred to be high in THC.

Industrial Hemp has been bred for centuries to be low in THC - so low it is virtually not there.

**Marijuana is hemp,
but Industrial Hemp
is not Marijuana.**



Vote Hemp.

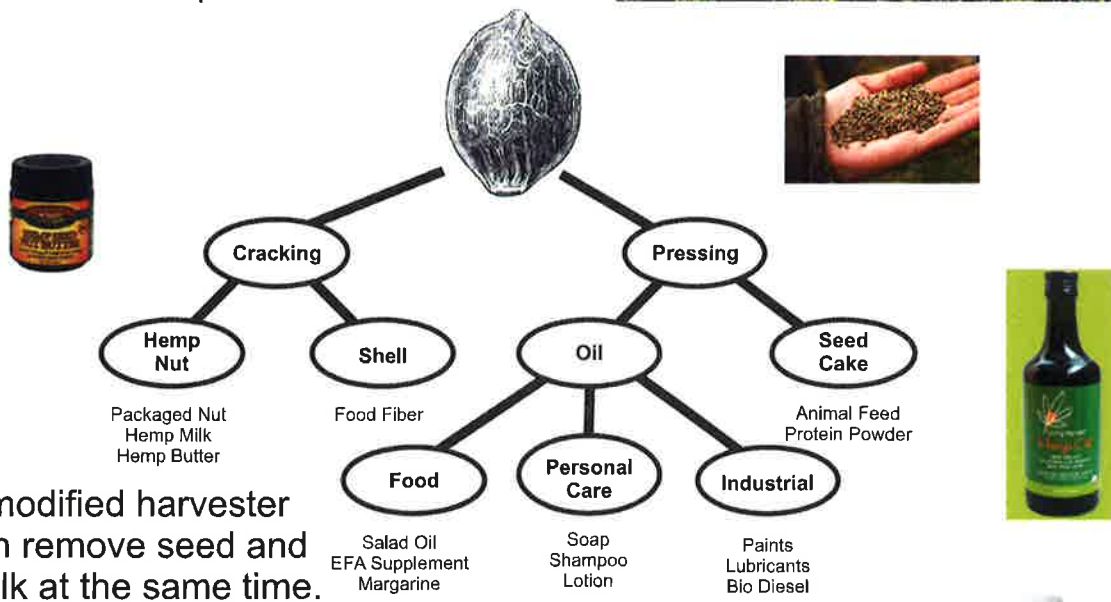
Hemp is Highly Nutritious Food

Hemp has been called the plant of 25,000 uses - as long as you don't use it in the United States. Many of its traditional markets have shrunk or gone overseas since it was banned in 1937. It is unlikely they will come back.

But a new generation has discovered the powerful nutritional benefits and the new markets for biocomposites that make a strong case for hemp's valuable contributions to our health, environment and economy.

The Hemp Seed is rich in Omega-3 oil and amino acids.

In all the plant kingdom, nothing so matches the brain's Omega oil profile as hemp seed.



A modified harvester can remove seed and stalk at the same time.

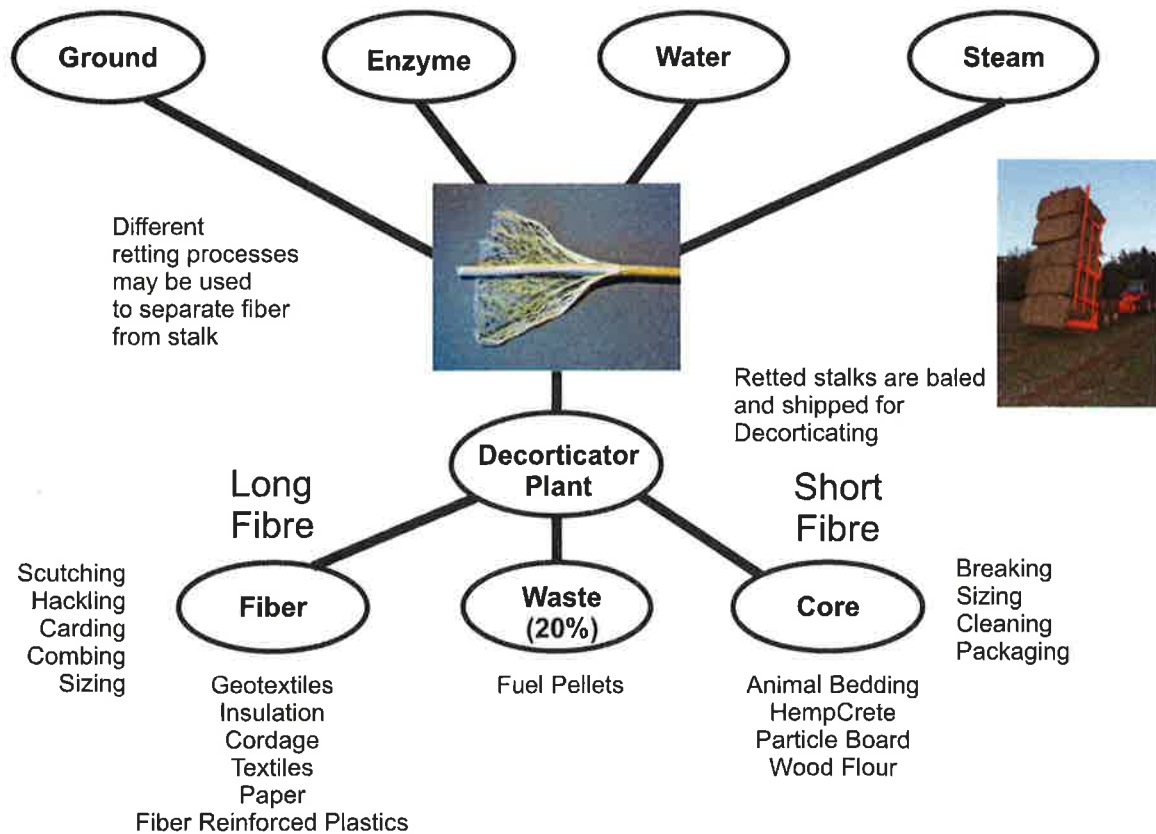


The Long and Short of it

Hemp is Two Fibers



Different Retting Methods



Pressboard, Fiberboard and Chipboard

Hemp vs Cotton

Which Fiber Should be Banned?



Hemp requires little input, but it loves nitrogen. It works well in rotation with vegetables using their leftovers.

Hemp likes a good rain now and then. It can protect waterways by absorbing nutrients with strong roots to hold farm runoff.

Hemp is good for soil. Its roots go deep to find water and aerate the soil. Farmers leave the stubble as a soil conditioner.

Farmers leave the stalks on the ground to dry and rot. The leaves fall off returning nitrogen and adding tilth.

Hemp grows so tall and dense it drives out weeds. Farmers employ it in rotation to remove weeds naturally for organic crops to follow.



Of the 46 pesticides used, 20 are moderately hazardous, 8 are highly hazardous and 5 are extremely hazardous

Worldwide Pesticide Market Share per Acre

Everything Else Combined	24%
Cotton	76%

24% of the world's pesticides are applied to cotton, and only a quarter of that lands on target. Worse, it's not much land.

Cotton is the world's thirstiest crop depleting ground water and polluting river basins.

Cotton depletes the soil and heavy irrigation poisons the land with salts.

Cotton uses defoliants before harvest.

Cotton requires chemical weed control.

Hemp is called Evil. Cotton is called Natural.

Bio-Composites Stronger & Lighter

Cars must eliminate their landfill requirement, increase their recyclability, reduce their weight and reduce their carbon footprint.

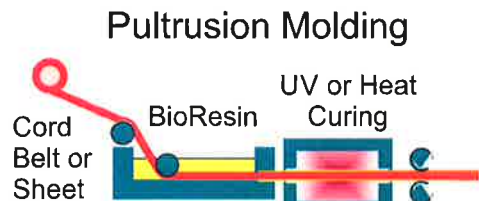
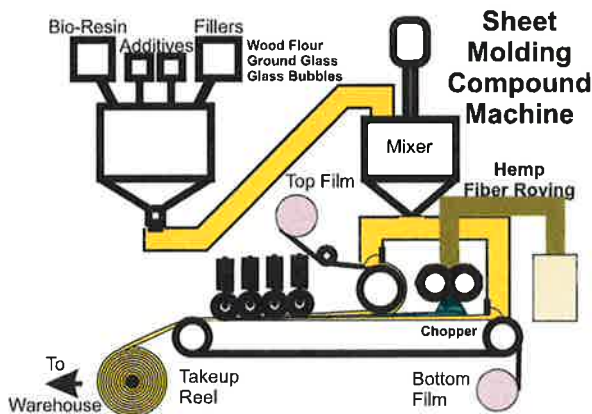
Hemp fiber added to bio-plastic resins does all that.



Lotus made the whole car of hemp composites.



The Mercedes C-class uses 20 kilograms of hemp to make reinforced plastic panels for doors, headliners, trunk liners, glove boxes and consoles.



Produces Rods, Strips, Sheets or Custom Profiles (eg. Decking)

Sheet Molding and Pultrusion are two plastic molding methods that are readily converted to Bio-Resins and natural fibers. At End of Life, the parts can be chipped and molded into large objects such as highway furniture.



A wide range of products are possible for Sheet Molding Compound.



Hemp Makes Healthy Efficient Houses

Hempcrete is a biocomposite formed with Lime and Hemp Shiv. It is renewable, recyclable and sustainable. It makes quiet, energy efficient housing (R30-R50 insulation) with no synthetic materials and an excellent 2-hour fire rating.



The walls breathe inhibiting the formation of mold and mildew causing no asthma or allergies. No "sick building syndrome" forcing premature demolition.



\$65,000 of hemp shiv, lime binder and lime render were imported from England - money that could go to American farmers and producers. Approximately 4 acres of hemp were used.

Water, Lime and Shiv are lightly mixed in a conventional mortar mixer. The mixture is lightweight and easily skidded around the site.



When dry, hempcrete is about a seventh of the weight of cement. It floats in water.

Material is poured between forms and tamped down. It sets up sufficiently to pull forms in as little as an hour. The material is light and can be passed bucket-brigade fashion to workers on scaffolding.

With forms removed, the walls are protected from rain for a week and kept moist to control the curing.



Hempcrete can be applied as loose-fill insulation. The attic is filled 12" of loose fill. The mixture uses less binder, but the lime continues to provide the fire rating.

The curtains are removed and the walls are left to dry and cure.



When dry, a special lime-based hard render exterior is applied similar to stucco.

The brick face was specially designed to maintain breathability.

Annual energy savings is about \$900 per year.



Tarpon Springs, FL

The house absorbed about 14 tons of CO2. Hempcrete can last a thousand years sequestering carbon all the while.

Hemp Reclaims Land It Improves Soil

Hemp can be used to help reclaim lands in the Central Florida Phosphate District (CFPD).

Farming is a legitimate land use that qualifies as reclaiming land for productive use, but the reclaimed material is poor or even radioactive making it unfit for food crops.



Hemp fiber is not a food crop so the land can be used entirely for hemp farming. Moreover, hemp draws heavy metals, including radioactive ones, up into its leaves. You can remove the leaves removing the toxins and even radioactivity from the soil.

With the toxins removed, food crops can be introduced.

The money derived from fiber crops can be used to fund wetland restoration. Hemp further aids wetlands by acting as a buffer to stabilize uplands and prevent migration of toxins and nutrients. Its roots go deep guarding the aquifer.

Reclaimed lands are unstable making them unsuitable for development, but hemp's deep roots improve the physical properties of soil. Testing is required to determine if this can make the land suitable for development after some number of hemp crops.



Cogon Grass is an invasive species throughout the South. It invades reclaimed lands and requires several years of herbicide treatment to control. It contaminates feed and silage crops.

Hemp is planted dense to block out weeds. After several hemp crops, the weed seed is exhausted. Hemp can block out the Cogon grass, but testing is needed to see if it will block the Cogon grass rhizome.

Hemp aerates the soil and fights the compaction from heavy equipment used to reshape the reclaimed lands.