Industrial Hemp A Trillion- Dollar Crop

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Abstract
There is a necessity to deeply transform the agriculture sector. Farmers earn low income from agriculture and the irregular weather turn their crops to dust. Hence there is an impulse to bring agriculture revolution for sustainable development. On searching on the solutions, an industrial hemp- Cannabis sativa, a low cost annual crop might be considered as a trillion dollar super crop. Hemp was our first agricultural crop, and remained the planet's largest crop. Its cultivation not requires chemicals, pesticides and can be grown in rotation with other crops. Hemp farming is completely sustainable. Today hemp is being cultivated mostly by China, Hungary, England, Canada, Australia, France, Italy, Spain, Holland, Germany, Poland, Romania, Russia, Ukraine, India and throughout Asia. There is currently renewed interest in once again growing this versatile crop. While hemp faces significant legal obstacles due to its close relationship to the marijuana plant, there are a number of states, are moving toward reviving the hemp industry. This review paper is intended to highlight the core of highbrow commercial plant, the industrial hemp and its impact on ecosystem. In addition to that it will provide a platform to focus more to cultivatesucharesourcefulplant.
Key: agriculture, revolution, hemp, commercial, sustainable.

INTRODUCTION
Hemp is truly an incredible plant with the potential to help “green up” many industries. “Hemp is the number one biomass producer on planet earth: 10 tons per acre in approximately four months.”39 The term 'Hemp' commonly refers to the industrial/commercial use of the stalk and seed for textiles, foods, papers, body care products, detergents, plastics and building materials. Hemp fiber is the longest, strongest and most durable of all natural fibers. It is a very hearty plant and grows very quickly in very diverse soil conditions. Cannabis sativa chemical constituents include about 100 compounds. These are mainly volatile terpenes and sesquiterpenes.

- Tetrahydrocannabinol (THC)
- Cannabidiol (CBD)
- α-Pinene
- Myrcene
- Linalool
- Limonene
- Trans-β-ocimene
- α-Terpinolene
- Trans-caryophyllene
- α-Humulene,
- Caryophyllene-oxide.

There are more than 25,000 products can be made from industrial hemp. Some of them are listed in fig.1
All parts of the hemp are incredible why it is often called as a “cash crop”. Cultivation of hemp for industrial purposes has been done by many civilizations for over 12,000 years. Though China has been the largest hemp producer over the years, other countries such as Australia and Canada are catching up. In traditional medicine of India in particular C. sativa has been used as hallucinogenic, hypnotic, sedative, analgesic, and anti-inflammatory agent.

**Hemp serves as amazing source for renewable materials**

The high fiber content of hemp makes it a natural resource for building materials, papermaking, and biodegradable plastics. Hemp is a presently viable environmentally sound energy source. It has broken into the realms of high fashion, has been mixed with silk for lingerie, and being useful to more applications. It provides material for shoes, jeans, and other tough sport clothing too because of its durability.

It is a potential food as well as a dietary supplement. The seed and seed-oil are high in protein, essential fatty and amino acids, and vitamins. It is good to use in iced tea, brewed into beer, fermented into wine, and distilled into other alcoholic beverages. There’s hemp milk too available. Hemp offers all classes of good building materials. It can be made into insulation as companies in the Netherlands and Ireland. It can be used to make engineered building products like fiberboard and pressboard, and even be used to make 'hempcrete', a stronger, lighter, and more environmentally friendly version of concrete.

Hemp is also a viable feedstock for plastics production. Indeed Ford famously manufactured a prototype car made out of hemp & soy plastic in the early 1940s. It showed that hemp plastic is a strong stuff. More recently hemp has been made into shower curtain liners, CD & DVD cases, and all sorts of other products. Hemp gives vegetable oil and it can be processed into biodiesel. Considering that, hemp could also be utilized to make liquid fuels that are chemically identical to petroleum-based gasoline or diesel as well. Hemp and humanity have been allied for over 10,000 years. Most of the non-Western world never stopped cultivating hemp.

One of the most captivating uses of hemp is in cleaning up soil contamination. Industrial hemp was tested at the site of the Chernobyl nuclear disaster in Ukraine in the late 1990s to heal the soil. Because of its fast rate of growing each season, up to 250-400 plants per square meter each up to 15 feet tall, hemp shows potential in cleaning up land contaminated with fly ash, sewage sludge, or other heavy metals. So hemp can be useful in phytoremediation process.

**Market outlook**

The production of hemp is legally prohibited in the United States. Many production and market possibility studies have been piloted by both federal and state research institutions. A number of these studies are listed and summarized in a 2012 Congressional Research Service report, “Hemp as an
Agricultural Commodity.” This study minutes that potential U.S. producers face not only existing regulatory prohibitions on industrial hemp, but also considerable international competition, particularly from Canadian and Chinese producers. This is owing to industry infrastructure development (Canada) and labor cost savings (China) advantages. Faster growing hemp products in market include hemp food and body care products. Particularly, hemp and hemp seed oil is an ingredient in some certified organic foods have been gaining great acceptance in recent years. In North America, certified organic hemp could be a possible in market. Adequate hemp processing facilities would also need to be in close vicinity to potential new producers, with site-specific market and processing viability analysis also prerequisite.

Legal Issues
When the Controlled Substances Act of 1970 was legislated to fulfill the treaty obligations of the United States as a signatory of the U.N. Single Convention, no exception was made for industrial hemp varieties of Cannabis in cultivation. Marijuana and its primary drug constituent, tetrahydrocannabinol (THC), were placed in the most tightly controlled group of drugs: substances defined by the Act as having a high potential for abuse and no currently accepted medical use in the United States. The newly created Drug Enforcement Administration (DEA) undertakes responsibility for the regulation of industrial hemp and marijuana alike. A growing number of states have accepted legislation to allow limited research or cultivation of industrial hemp. Typically these laws do three things: (1) re-define “marijuana” as Cannabis sativa containing specified threshold levels of the controlled substance THC, (2) define “industrial hemp” as Cannabis sativa with below-threshold levels of THC, and (3) create a licensing structure for researchers or primary industrial hemp producers.

The World Trade Organization recognizes industrial hemp as a legitimate crop, as do the NAFTA and GATT trade agreements, of which the United States is a signatory. Both the National Conference of State Legislators (2000) and the National Association of State Departments of Agriculture (2003) have passed resolutions asking Congress to direct the DEA to revise its policies to allow states to establish regulatory programs for industrial hemp farming and research.

The Industrial Hemp Farming Act of 2005 (HR 3037) was the first legislation announced at the federal level to exempt industrial hemp from the Controlled Substances Act. No action was taken on the bill, and the legislation was re-introduced in 2007 (HR 1009). Under current federal regulation, DEA-issued permits to grow Cannabis are subject to heavy security requirements that make the conduct of research impracticable for all except police analytical laboratories. Licensing requirements for industrial hemp research and commercial cultivation are similarly extensive elsewhere.

In Canada, controlled research was begun in 1994, with commercial cultivation following four years later. There were a lot of security provisions issued for industrial hemp cultivation. That include use of certified low-THC seed (licenses for seed crops are only issued to members of the Canadian Seed Growers’ Association), detailed crop testing and reporting, with submitting the locations of the storage, buyer of the crop and Global Positioning System coordinates of the crop. The evidence should be submitted that the applicant has no criminal record with respect to drug offenses. Existing and proposed regulation of industrial hemp farming normally requires that crops are tested and approved to contain less than 0.03% THC before harvest.

Consideration on the distinctive qualities of hemp suggests that hemp prohibition affects a broad range of enterprises, ranging from local economic significance, to global industries and products that are present every day in our lives. The modern technological uses of this ancient crop may be the most promising. The number of products that can be made with hemp is clearly an issue of invention, not scientific fact. Over-regulation of industrial hemp cultivation—for example, laws requiring that hemp seed be purchased from a certified monopoly, which legal hemp varieties contain “terminator genes,” or that buyers must be identified before farm licenses are issued should be avoided.
Repeatedly the politics of Cannabis regulation have been so severe that science was sacrificed by factions intent to either demonize or idolize the plant. The environmental performance of industrial hemp products is of particular interest because, to a large degree, environmental inefficiencies impose costs on society as a whole, not just on the producers and consumers of a specific good. Whatever may the hindrances of hemp cultivation and utility, we can try to routine such a most valuable crop (from top to bottom) in proper way. This study seeks to add to the discussion about hemp prohibition by comparing the performance of hemp to its substitutes in a few key industrial applications.

REFERENCE


