

A RENEWAL OF COMMON SENSE

The Case for Hemp in 21st Century America

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In conjunction with VoteHemp.com

Overview

The controversial subject of why or whether to grow industrial hemp in the United States of America is often debated yet much misunderstood. This document will definitively present the hemp industry's case with a discussion on the following topics:

- Hemp is the premier and model crop for a new decentralizing agricultural-industrial trend called *bio-regional economics*, also known as the “closed circle” concept that has captured the interest of industrialists and environmentalists alike.
- Hemp's positive environmental and economic impact on farmland as well as rotational crops will illustrate the importance of efficient land use as it promotes political, social and economic stability, whereas wasteful and inefficient land use contributes to fluctuations and decay.
- Hemp has been used for thousands of years in all areas of commerce and the story of why hemp cultivation in America came to a halt in the 1930's will be told.
- A market-oriented analysis of hemp's modern uses will reveal its versatility and value as a primary feedstock for a wide range of industries.
- The clear and widely recognized distinctions between hemp and marijuana will be addressed to dispel current concerns surrounding the legislative and law enforcement environments.
- The broad political support base for hemp includes legislators, scientists, students, environmentalists, nutritionists, industrialists, farmers and consumers. Arguments as to why the present political winds are shifting with regard to *cannabis* along with the rise of the largest voting block ever will be addressed.

With thirty-one other nations growing industrial hemp and the United States representing the largest consumer and industrial market for its products, America is poised to take advantage of an unprecedented opportunity.

Bio-regional Economies and the Environmental Benefits of Hemp

The Problem: Centralized Agricultural Production and Non-Sustainable Land Use

To understand why the deregulation and re-commercialization of industrial hemp is so desirable today, it helps to first take in the context of the larger agricultural and industrial picture.

In recent decades, the political, economic and social landscape in America is increasingly being dominated by large privately owned entities. This trend towards the globalization of trade, taking advantage of lower costs of production in developing countries, often comes at the expense of local farming and commerce. The essence of today's call for campaign finance reform speaks directly to this concern over the growing influence of business on governmental decisions. Arguably, much of the disenfranchisement of the American populace, as well as the stagnation and atrophy of so many American family farms, comes as a result of their talent, labor and natural resources being turned into commodities in the name of free trade. The time has come to seek a balance.

All too often, land is overused or polluted in an effort to maximize short term production at the expense of long term viability, a model that serves large, centralized concerns but does little to protect the environment or its inhabitants. When resources are predictably spent, or prices get too high, global organizations who have had use of the land while it was fertile still have the option to move on to other parts of the world. However, those communities tied to the same land must now provide the same income without the large buyers and often with weak topsoil, polluted waterways or clear-cut forests. Taxpayers pay for bailout or cleanup programs made necessary by this flawed cycle. The exit of the larger entity's purchasing requirements creates a spotty local feedstock market, further harming local industry. In the meantime, the same larger entity can afford to import alternate source feedstocks at prices much lower than local areas with weak or spent land can produce.

The cycle of poor performance, wastefulness and pollution is perpetuated through what are generally accepted accounting principles and other inert assumptions that ignore critical external considerations such as environmental and social costs. For example, the costs of water, timber products and fossil fuels dictate modern commerce by framing the definitions of efficiency and profitability. Government subsidization of water and logging on public land encourages wastefulness and discourages conservation. Unrealistically low petroleum costs enable commerce that would otherwise not be economically feasible if accurate military and environmental costs of securing and exploiting these resources were truly accounted for. Capital lending structures provide that the costs and risks involved in setting up one centralized mill versus many smaller mills to effect the same output are lower, yet since larger mills often have no efficient way of utilizing process wastes, the actual environmental costs are higher.

Forcing the land to impossible returns without recycling and recovering the waste generated is the course this nation has been on for over half a century. The social, economic and environmental costs become clearest when considering the continuously shrinking number of farms in the U.S., the continuing loss of top soil and the decreasing availability of irrigation water in many areas. This path logically leads to further dwindling resources which will in turn concentrate the country's natural resources and therefore much of its wealth in the hands of a few. This is not the vision of the founding fathers as outlined in the Constitution of the United States.

The Solution: Efficient Land Use and Bio-regional Industry

A bio-regional economy focuses on obtaining high value for the resources of the local land, recycling the waste and end products ad infinitum and thereby creating a "closed circle" of farming and industry. One of the central principles of this practice is that a significant portion of local needs should be provided for with resources grown or produced in that same region. This includes food, shelter and energy as well as the talent and labor required for the society to function and grow. The resources must be managed by taking care of the environment and eliminating waste. When a society can care for its land and provide for itself without needing to import or trade with others for its basic necessities, it is self-sufficient, sovereign and powerfully immune to the dictates of private or public entities whose interests may run counter to their own. Should we examine the motivations and philosophies of the founding fathers, we may conclude that this concept is as close to the "American Way" as any and ought to be further encouraged through the sound application of public policy.

The bio-regional model is one that welcomes the contributions of both small and large organizations. Large companies often have the capital to finance a closed circle industrial system while smaller companies often have the talent and know-how to effect such change. While smaller farms grow biomass for energy alongside food crops, grain elevators at large organizations become refueling stations. Fragmented small producers can consolidate their waste to be fed into the recycling plants operated by large producers of the same commodities. The opportunities for cooperation are limitless.

While accelerating globalization seems to defy efforts that strengthen regional industries, the two concepts are not mutually exclusive. Both are important symbiotic elements in a healthy world economy- a global mosaic of strong bio-regional economies. Related regional industries that have managed to loop their production and waste streams will experience higher productivity, competitive advantage, export potential, and ultimately less waste in a cleaner environment. At the same time, an information-empowered marketplace will mean a barrier-free exchange for and between regional economies worldwide.

Hemp and the Bio-regional Model of Capitalism

As an industrial crop, hemp is particularly well suited for the bio-regional model because it fits every tenet of its philosophy:

- Hemp is a boon for the environment; typically pesticides are not required and weeds are suppressed along with some soil-borne pests, thus improving the soil structure for the subsequent crops.
- Hemp's leaves return nitrogen back to the soil, i.e. they convert nitrogen fertilizer into organically bound nitrogen, which improves soil fertility. Rotating hemp with soybeans also leads to a dramatic reduction of cyst nematodes (a soy-decimating soil parasite with few cures) without any chemical input.
- Hemp's versatility speaks to the very heart of the bio-regional issue - land use and the profitability that comes from efficiency.
- Hemp has the potential to provide food, clothing, shelter and energy for the local population.
- Hemp has been found to be superior to most major monocrops in terms of limiting damage to bio-diversity.
- Because of the bulkiness of hemp stalks, hemp fiber demands local processing.
- Everything produced from hemp can be recycled back into industry or back into the land.

To operate in the bio-regional model without hemp would be like running a recycling plant without plastic bottles or aluminum cans. Hemp's inherent usefulness in a world poised to close the industrial circle is clear.

Pure capitalism assumes its noblest identity when the freedom to exchange value for value is expanded to all members of society. Everyone may be free to trade their talent and labor for lawful currency and vice versa, helping themselves and others at once, ensuring prosperity. However, when such prosperity is narrowly defined as the accumulation of currency, the ideals begin to break down, stratifying society by way of inequitable resource access and creating unrest. Conversely, when prosperity means indefinite land production, clean air and water and access to resources for the vast majority of citizenry, society functions smoothly and profitably. Because of its versatility, its beneficial agronomics and the need for its local processing, industrial hemp offers to play a potentially vital role in the maintenance of the nation's resources and the distribution of wealth along the most idealistic lines of capitalism.

Historical Perspective of Hemp in America and Around the World

The history of hemp and its prohibition in the U.S. is a classic tale of age-old customs and practices unraveled at the hands of competing economic interests, raising some of the same issues in history now voiced by those demanding campaign finance reform today.

Cannabis Sativa L., literally “useful hemp,” has been employed in the manufacture of textiles, paper, energy and food for thousands of years in virtually every culture, including our own. Hemp apparel was worn regularly from Asia to Europe. The first paper in China was pulped from hemp and the Magna Carta and Gutenberg Bible were printed on paper made with hemp rags. The paintings of Rembrandt and Van Gogh were usually painted on hemp canvas (the word “canvas” itself derived from *cannabis*) and used hemp oil based paints. Hemp fiber was found to be a reinforcement agent in a 6th Century bridge in France. Hemp seed was considered a key nutritional element in Chinese medicine for everything from digestive disorders to pain, fever, ulcers and many other ills and was consumed as a primary foodstuff by peasants throughout Europe and Asia for centuries.

In America, hemp was so important to the infant colonies that Jamestown passed our first hemp law in 1619 making it illegal *not* to grow hemp (followed by Massachusetts and Connecticut in 1631 and 1632). Hemp was at one time a commodity considered lawful for the payment of colonial taxes. The original drafts of the United States Constitution and Declaration of Independence were written on hemp paper. Thomas Jefferson and George Washington were hemp farmers and advocates of growing hemp “for the economic necessity of the state.” The U.S.S. Constitution was equipped with sixty tons of hemp rope and ship sails; the majority of all twine, rope, ship sails, rigging and nets up to the late 19th century were made from hemp. The pioneers’ covered wagons were fitted with hemp canvas. Hemp oil was used extensively for lighting oil, paints and varnishes.

The ensuing prohibition of hemp in the United States can be traced to a specific set of events, occurring at a critical crossroads in the nation’s industrial history. In the 1920’s, Du Pont of Wilmington, DE, had developed and patented fuel additives such as tetraethyl lead and numerous other new petroleum-based synthetic products such as nylon, cellophane and plastics. At the same time, there was a “Chemurgy” movement underway that offered solutions more in line with a bio-regional, closed circle model. With prominent leaders such as Thomas Edison, Henry Ford and George Washington Carver, other companies were developing synthetic products from renewable biomass resources, especially hemp. Henry Ford built an automobile from a mixture of plant fibers, such as hemp, and plant based resins that ran on biomass fuels. Ford even made it clear that he planned on using only resources from the “annual growth of the fields” as the feedstock for his industrial ambitions. In addition, there was also a wave of technological innovation with respect to hemp, whose widespread use had suffered with the introduction of technologies to process

timber and cotton. Akin to Whitney's cotton gin, George Schlichten's hemp decorticator brought economy and efficiency to hemp processing and promised to expand hemp's uses in a new industrial era, a markedly different path from what Du Pont's new technologies promised.

At the time, the U.S. Secretary of the Treasury was Andrew Mellon, President of Mellon Bank and at the time of his appointment, the wealthiest man in America. Mellon Bank also happened to be a major financier to Du Pont Corporation and loaned large sums of money to fund the latter's growing petrochemical business, one that in time would account for 80% of its volume. Mellon appointed Harry Anslinger, an associate who would later marry Mellon's niece, to head the Federal Bureau of Narcotics (FBN), later evolving into the Drug Enforcement Agency or DEA.

Years earlier, animosity toward Mexico over the seizure of prime timberland by rebels prompted William Randolph Hearst to engage his powerful newspaper empire in a long campaign of defamation against Mexicans, tying their reported lazy and crime-prone behavior to their use of "marihuana" (later extended to black jazz musicians). This represented a launch point for further campaigns against "marihuana" as the "Assassin of Youth," "Devil's Weed" and "Reefer Madness." Countless sensationalist and baseless articles were published linking marijuana to all kinds of violent and abhorrent crimes, including rape, murder and defying a white man's superiority.

Interestingly, the introduction of the word *marijuana* was unique to Hearst's empire and was not a term in the American popular lexicon until that time. Little distinction was made between *cannabis* for industrial and medicinal purposes and that which was smoked recreationally ("Indian hemp"). Hearst's use of a new word confused the American populace who had been using *cannabis* in various forms for generations. Fear generated by the media led many to obediently oppose "marihuana" (Anglicized spelling) for the safety of their children.

As the anti-marijuana crusade gained momentum through the mid-1930's, Anslinger, once Assistant U.S. Commissioner on Prohibition, spent two years secretly drafting the "Marijuana Tax Act," a bill that sought to establish prohibition through taxation. The bill, which made no distinction between hemp and *cannabis*, referring only to "marihuana," would not ban hemp or *cannabis* outright, but instead sought to prohibit its production by imposing reporting and taxing requirements on producers, distributors and manufacturers.

In 1937, the bill was submitted to the House Ways and Means Committee -the only committee that could send a bill to the House floor without being subject to debate by other government agencies, such as Food and Drug. The Chairman of the House Ways and Means Committee at the time was a Du Pont ally. Since the bill had been prepared in secret, opposition from the American Medical Association, the National Oil Seed Institute and various hemp producers came too late. The federal testimony

entered into record by Anslinger and the FBN was primarily based on the same press clippings from Hearst's newspaper empire. Deliberations on the bill lasted roughly 90 seconds before being approved and signed into law by Franklin D. Roosevelt. Du Pont's 1937 Annual Report urged continued investment in new, but not yet accepted petrochemical products. The report anticipated "radical changes" from the "revenue raising power of government...converted into an instrument for forcing acceptance of sudden new ideas of industrial and social reorganization," an allusion to using taxation as a tool to influence social and industrial policy.

Hemp was suddenly economically unfeasible and for all intents and purposes, prohibited. It is worth noting that power exerted by an elite few was responsible for hemp's prohibition, whether this is attributed primarily to the circumstantial evidence implying industry lobbying on behalf of petrochemicals versus the Chemurgy movement, or to the clear proof of hemp falling victim to anti-drug hysteria. Clearly, the farming and industrial communities did not share these sentiments. In the spring of 1937, *Mechanical Engineering* published an article describing hemp as "the most profitable and desirable crop which can be grown." In the summer of 1937, *Popular Mechanics* wrote an article touting hemp as a "new billion dollar crop," indicating thousands of uses for the plant now that the technology to process hemp efficiently was available. The article was published in February 1938, the same month that the 1937 Tax Act went into effect.

Ironically, facing shortages of abaca from Japan-occupied Phillipines during World War II, the U.S. government reversed its stance and promoted the production of hemp once more in 1942. Promotional materials such as the short film "Hemp for Victory" were developed to encourage farmers to grow hemp and licenses were issued. In 1943, more than 140,000 acres of hemp were grown for making rope, canvas and other supplies. After the war, the program was dropped and never mentioned again. The use of hemp and other natural fibers waned while the use of synthetic fibers rapidly expanded in line with America's hegemony in industry, world affairs and international law. Only in communist countries (U.S.S.R., China, Hungary, Romania, etc.) and a few other Asian nations did labor-intensive production of hemp continue on any significant scale, mostly for coarse textiles and cordage. While most of the West and areas under its influence followed the protocols of the U.S. and obstructed or even prohibited the farming of hemp, France continued to grow hemp on a limited scale, primarily for cigarette paper.

Then, in 1991, hemp was rediscovered in the West. Several books portraying it as *the* versatile and environmentally friendly crop created new demand for hemp textiles and body-care products. Promulgating a new paradigm of sustainability coupled with the apparent injustice of hemp's prohibition, early hemp advocates managed to energize manufacturers and consumers as well as galvanize support for an inquiry into present day public policy. By 1993, worldwide hemp sales (retail receipts only) were estimated at \$5,000,000. A German translation of hemp's benefits, combined with domestic research of hemp's German history, successfully ignited a wave of hemp advocacy and manufacturing, leading to hemp's re-legalization in Germany and

eventually the UK and other European countries. By 1998, Canada had re-commercialized hemp farming in line with some thirty other countries around the world. By 1999, worldwide retail receipts were estimated at \$150,000,000 with the U.S. consumer purchasing over 60% of that amount. These numbers do not take into account the large quantities absorbed by commercial and industrial users in the U.S. and around the world, whose major purchases have justified the planting of tens of thousands of acres in these countries.

The Market for Industrial Hemp

Hemp is unique among other crops, in that every part of the plant has utility and potential market value. Hemp's oilseed makes high-grade food and beauty products. The stalks produce fiber and cellulose for everything from automotive parts and fine clothing to building products and fuel. A graphical overview of hemp's versatility is attached. A brief overview of current and future uses of hemp follows.

The Oilseed

The hemp seed, actually a tiny nut, is comprised of a hull and a meaty inner core. Whole hemp seeds have traditionally been used for birdfeed. In Canada, the U.S. and some Asian countries, toasted whole hemp seed is consumed as a snack food comparable to toasted sunflower seeds. However, most of the seed's value is derived from either dehulling the whole seed and/or crushing it for oil, as the inner core is an excellent source of desirable fatty acids and proteins.

The Oilseed: Oil

Hemp oil's primary value is its high content of the two essential fatty acids (EFA's) Omega-3 and Omega-6. Essential to tissue growth and metabolism, these critical EFA's cannot be produced by the body and must instead be present in the diet. Intake of both EFA's in sufficient amounts and proper balance is essential for prevention or treatment of a wide range of conditions, including diabetes, cardiovascular disease, menopause, osteoporosis, atopic eczema, psoriasis and acne. With an EFA content of about 75%, hemp oil not only contains one of the highest amounts of EFA's of all plant oils, but it also contains a significant amount of the Omega-3 EFA which is often deficient in the human diet. Its balanced EFA ratio, which closely matches human nutritional requirements, makes hemp oil an ideal ingredient in a variety of food, supplement and personal care products. If larger production volumes and lower prices can be achieved, hemp oil may well find industrial uses similar to those of linseed (flax), sunflower and soybean oils, which are now used in paints, inks, solvents, binders and in polymer plastics.

Nutritional Supplements

Encapsulated hemp seed oil supplements are found in natural foods markets, usually next to increasingly popular flax supplements. Flax oil, with its very high content of the Omega-3 EFA, is usually taken short term to correct Omega-3 deficiencies. However, hemp oil is the better choice for long-term consumption because it contains a more desirable balance of the two EFA's. The value of hemp oil as a broad-range oil supplement is further enhanced by the presence of a rare fatty acid, gamma-linolenic acid (GLA), and is the primary reason people buy borage and evening primrose oil, which helps to treat such ailments as neurodermatitis, arthritis and PMS.

Food

Because it is more versatile, tastier and keeps better than other high EFA oils, hemp oil is also used as a culinary ingredient. Hemp oil may be used as one would use a

fine olive oil- for sauces, flavorings, dressings, low-heat cooking and sautéing. The success of fine olive oils as well as the exotic nut and seed oils category (grapeseed, hazelnut, macadamia, etc.) provides a strong indication that pure, bottled hemp seed oil would have a moderate yet lucrative market. In addition to bottled oil, there are many fine food preparations on the market that utilize hemp seed oil as the key ingredient, such as salad dressings and other oil-based marinades, chutneys and sauces.

Cosmetics and Personal Care

Since the introduction of The Body Shop's line of hemp based body lotion, hand cream, soap and lip conditioner to the global marketplace, demand for hemp oil has grown rapidly. Revlon plans to introduce a hemp oil based line at the end of this year. Alterna, Rachel Perry, Kiss My Face and Jason's Natural Cosmetics have successful hair and skin care lines made with hemp seed oil. Based on function, Dr. Bronner's Magic Soaps changed its formula to use hemp oil instead of jojoba oil and has seen sales increase dramatically as a result. Hemp oil cosmetic products may be found in many major retailers including Wild Oats, Whole Foods, Ralph's, Kroger's and Trader Joe's markets across the U.S. Hemp oil's versatility in the personal care market is enhanced by the introduction of advanced processes that allow the oil to blend with water or be turned into gels and even solids, enabling its benefits to be incorporated into even more cosmetic formulations.

Household Products and Industrial Uses

Like soybean or linseed oils, hemp oil could also find commercial uses in ecologically sound paints and varnishes, cleansers, inks and other applications. In Europe, for example, a vegetable oil based detergent which uses hemp, sunflower and canola oils as raw materials has demonstrated high cleaning performance and rapid biodegradation in the wastewater treatment plant. Since each vegetable oil has different properties, manufacturers must review the fatty acid profile, stability and surfactant activity of each to determine its appropriate use in a given application. The key for hemp oil to expand into this market includes a drop in the price of seeds and the establishment of oil crushing on a larger scale to make hemp oil more competitive with other oils.

The Oilseed: Meal

Hemp meal, the seedcake remaining from the crush, contains a large fraction of protein, with a composition similar to that of soy. This makes it an ideal animal feed, but further processing will also yield superior products for human consumption.

Animal Feed

Since the crushed seed is usually extruded into small pellets ideal for animal feed, this segment has been an obvious market for hemp meal. French and British hemp processors have marketed processed meal as fish bait. Animals such as horses, cows and chickens respond well to hemp meal as a dietary supplement as it is high in protein as well as the residual EFA's. Recent trials in Kentucky reveal that hemp-fed cattle require less feed and digest it more efficiently. As most of the feed market

operates on the basis of “protein per pound,” soymeal is the main competitor. Hemp meal marketers would do well positioning the meal as a *supplement* for diets that require EFA’s in addition to protein to command the higher price. As the benefits of hemp are promoted, this market will develop into a clear niche.

Protein Flours and Powders

The market for high protein powders and flours for use in shakes, energy bars, baking preparations, etc. is well established. Competitive products such as soy, egg and whey protein are well priced. However, these proteins require product development to mask bland or astringent flavor profiles. Hemp’s naturally nutty flavor complements the fruit, nut and chocolate ingredients normally used in these products. Hemp meal can be finely ground and sifted to increase the protein content close to that of soy. If the costs of seeds and crushing can be reduced, the availability of hemp flours and powders will grow large enough and their price will become low enough to compete directly with other protein sources in a large and rapidly expanding market. Research and development on the production and properties of hemp protein is already underway in Canada.

The Oilseed: Hulled Hemp Seed

The hulled hemp seed or hemp “nut” remains after the removal of its hull. It contains 30-35% protein and 35-40% EFA’s by weight. This superior nutritional profile makes it ideal for a wide range of food applications.

Food

Hulled hemp seeds resemble sesame seeds in appearance and are comparable to sunflower seeds in taste. They may be incorporated in baking or simply added to foods such as soups or salads. Hulled hemp seed blended in shakes or drink mixes is an excellent way to meet daily protein and EFA needs. Hemp nuts may be ground and turned into nut butter for spreads and sandwiches. Lightly toasting the nuts will release the oil’s fragrance and enhance the flavor of the nutmeat.

Currently, hulled hemp seeds are sold in bulk and utilized in various food products ranging from snack bars to corn chips, nut butters and granolas. Nature’s Path, a well-known natural foods producer, has featured hulled hemp seeds in their Hemp Plus™ cereal, completing their line of other healthy grain based cereals such as Soy Plus™ and Flax Plus™. A large fraction of hulled hemp seeds are used in Germany by bakeries for specialty breads and pastries. In the U.S., research is being conducted to use hulled or whole hemp seeds in the production of “hemp milk” as an alternative to soy or rice based non-dairy milks, a category that is now the largest selling in the natural foods business.

The Hemp Stalk

The stalk of the hemp plant contains two types of fiber – the outer bast fiber which can be processed into long strands, and the inner woody core, or hurds, which are typically processed into material resembling wood chips. Following the harvest and field retting, a process whereby initial softening of the bast fiber occurs, the bulky

stalks are baled and transported to a local fiber processing plant. A decorticator then breaks the stalks and removes most of the hurds. Further processing steps clean, card and refine the bast fiber. Alternately, the whole stalk may be burned as biomass for fuel.

The Hemp Stalk: Bast Fiber

Hemp's bast fiber is among the longest and strongest of plant fibers, long prized for its versatility in making everything from clothing to canvas and cordage.

Textiles

The market for hemp apparel, footwear, luggage and other accessories is based on hemp's reputation as a durable fiber for longer, more comfortable wear and colorfastness. Since the mid-1990's, numerous apparel manufacturers have begun using hemp fibers in their designs. Adidas created a hemp fabric shoe. Armani designed a tuxedo made from hemp. Calvin Klein has used hemp for years and has listed it as "vegetable fiber." Two Star Dog, a grass roots hemp company, produces apparel that is featured in Nordstrom. Hemp is as versatile as any other fiber and blends well with cotton, silk, rayon, linen and wool. Currently, raw materials must be imported from Eastern Europe and China, keeping prices up for domestic producers. Local supplies of hemp fiber will encourage more business development and acceptance of hemp as a mainstream fiber for a variety of apparel and accessories. This will be accelerated by the establishment of advanced fiber processing technologies which can convert hemp into a form resembling cotton which may then be further processed on cotton equipment.

Biocomposites

Composites are materials made from a binder, usually a resin, and a reinforcement fiber. Composites in which the resin and/or fiber are made from renewable resources are often called "biocomposites." Bast fibers, such as hemp and flax, have increasingly been used as the reinforcement fiber in composites where they can achieve higher strength and a reduction in weight. Most commonly, hemp, other natural fibers and polypropylene are blended into a non-woven mat, heated and compression molded into the final part. The result is a hard and durable shape that replaces traditional plastic or fiberglass processes. Alternately, when pressed as a flat board, it can substitute for many paneling applications that currently use wood.

Automobile manufacturers are the most visible users of biocomposites containing natural fibers. Ford, GM, DaimlerChrysler, Saturn, and BMW are currently using or experimenting with such materials for their door panels, trunks, head liners and other parts. In Germany, hemp fiber has significantly increased its presence in such automotive parts since 1997. Components using hemp fiber are also in development for the recreational vehicle industry. The same technology applies to furniture makers who can replace costly and labor intensive plastic and wood manufacturing processes with one-step biocomposite molding. Hemp, with its superior tensile strength, is an outstanding raw material for this potentially huge market. Replacing fiberglass with biocomposite materials may also be safer for workers.

The hydrocarbon absorbent market is a useful home for material generated from the waste stream of a biocomposites plant. Second quality, pre-compressed material offers a solution to a common problem of absorbing oil and hydraulic fluids. The matting offers safety for workers and prevents fluids from being washed into the environment. Completing the recycling circle, the energy content (its BTU value) may be recovered from the used mats by being turned into fuel pellets and blown into a combustion chamber. There are no emission issues and significantly less ash. Energy is recovered from the fiber itself as well as what the mat yields in hydrocarbon value. This may be applied in any thermogeneration plant that uses coal for generating electricity or heat. The Department of the Navy reviewed this proposal several years ago stating domestic supply constraints as the deterrent to development.

Insulation Materials

Another emerging market for hemp and flax fibers in Europe is their use in building insulation. These mats achieve the same heat retention as fiberglass mats, yet provide better sound insulation and are safer to handle. Due to the currently small production volume, they are more expensive, thus purchased primarily by eco-conscious consumers. However, the emergence of more efficient technologies for fiber processing and mat production promises to make these products more cost competitive in the future.

Paper

The expanding role of non-woods in the papermaking process provides a timely and lucrative opportunity for hemp in the printing and writing paper sector. Several U.S. companies, such as Crane & Company, Inc., the producer of U.S. currency paper, and Living Tree Paper have begun to blend hemp fibers into their papermaking processes for additional strength, appealing to environmentally conscious buyers.

Hemp's bast fibers contain the highest cellulose (85%) and the lowest lignin content (3-5%); much of the energy and chemical intensive method for pulp processing is related to the removal of lignin, which binds the cellulose together. The short fibers from the core contain relatively high cellulose as well (70%) with a higher lignin content of 23%. By contrast, wood's lignin content runs as high as 34% with cellulose content around 50%.

In order for hemp to make significant inroads into this market, larger scale and/or more efficient pulping operations will be required to make it more competitive with other pulp sources. Today, hemp is not well suited for commercial grades of paper and is best used in various specialty and industrial paper applications. Straw and post-consumer waste are good choices for non-wood pulping material because of their availability and environmental impact and hemp demonstrates its value as a pulping material when added to strengthen lower grade pulps such as these.

The Hemp Stalk: Inner Core

Hemp's woody inner core is characterized by its low density and high absorbency. There is a large potential market if the core is processed correctly.

Animal Bedding

Currently, the vast majority of hemp hurds produced in the European Union is sold as bedding for horses and other animals. The Queen of England uses hemp bedding for her horses. Compared to the low-price competitor cereal straw, hemp hurd bedding exposes sensitive animals to less dust and fungal spores and achieves considerably higher absorbency, thus requiring less maintenance and minimizing odors. The market is becoming larger as breeders and trainers become aware of hemp core's inherent benefits. Processing modifications have allowed hemp core to extend to kitty and other animal litters.

Hydrocarbon Absorbent

Oil spills are usually cleaned up with clay and polypropylene based products. The disposal of the spent oil produces its own environmental problems along with perpetuating the use of petroleum products and the hazards associated with this commodity. Using hemp core as an absorbent for oil spills is not only efficient and environmentally safer, but also the BTUs may be recovered in the manner described above.

Nitrogen Absorbent/Fertilizer/Soil Amendment

Unsanitary conditions on bird farms are compounded by the use of wood chips in the manure trays. Inefficient absorbents with little nitrogen uptake, wood chips result in toxic sludge, agricultural runoff and health problems. Technology exists to use hemp core for the absorption of manure and convert the absorbed product into pathogen-free organic fertilizer. The health and environmental ramifications of such a change speaks for itself and the material recovered produces a closed circle for the farmer with little change to his current methods.

Hemp hurds have also been demonstrated to be an effective ingredient in potting soils and other soil amendments with a potentially large market. Since hurds compete with wood waste materials, this market is currently less profitable than that for animal bedding.

The Whole Hemp Stalk

Certain applications enable the stalk to be processed whole, the most compelling use being that of an alternative source of energy.

Biomass Fuel

Biomass (all biologically produced matter) conversion to fuel has proven technically feasible in laboratory tests and by continuous operation of pilot plants in field tests since 1973. In recent years, the production of ethanol – a proven vehicle fuel – from cellulosic biomass, such as cereal straw or wood, has moved into the commercial demonstration phase. As the “energy crop” is growing, it takes in carbon dioxide

from the air and converts it into organic carbon, which accounts for most of the fuel value of biomass. When burned, the organic carbon is converted back to carbon dioxide, creating a closed loop for the atmospheric carbon. Petroleum, by contrast, consists of fossil organic carbon. Its combustion thus results in a net increase in carbon dioxide in the atmosphere. The release of carbon dioxide from the combustion of oil, gas and coal is the main cause of the greenhouse effect, i.e. the global warming and changes in weather patterns experienced over the last decades. The use of biomass for energy is thus a recognized, long-term element in the fight against global warming.

Various technologies exist to convert biomass into the gaseous or liquid fuels on which our economy relies. For example, starch from corn grown in the midwest has traditionally been the source of some of the ethanol used as a fuel additive in the U.S. Another option for the conversion of cellulosic biomass, such as hemp stalks, to ethanol is their hydrolysis to sugar, followed by fermentation and removal of the produced ethanol by distillation. The technical and economic viability of this technology is currently being investigated in several commercial products in the U.S. Because of the unrealistically low price of petroleum, both routes are currently only competitive with governmental support. However, technological innovation and increasing scarcity of fossil fuels will eventually make fuels from biomass competitive.

Depending on variety and growing conditions, hemp is a very effective producer of biomass. If hemp is grown for seeds, the biomass represents a valuable by-product. This offers new opportunities for farmers and contributes to America's energy reserves. Baling equipment condenses the bulk of hemp stalks, reducing transportation costs from field to the conversion plant. As is the case with paper, processing locations must be located within a 50-mile radius, causing local development and creating jobs.

Hemp vs. Marijuana- Rhetoric vs. The Reality

It is important to examine the difference between hemp and marijuana. The blurring of this distinction, out of ignorance or for political purposes, is precisely the reason why U.S. farmers have not been allowed to grow this lucrative crop.

Hemp is not marijuana or vice versa, as the public has been led to believe for sixty years. Both share the same genus and according to most taxonomists the same species, *Cannabis Sativa* L. More importantly, both produce the same organic compounds known as *cannabinoids*, which are unique to the genus *Cannabis*. The two main compounds, *delta-9-tetrahydrocannabinol* (THC), i.e. the most psychoactive cannabinoid, and *cannabidiol* (CBD) are found in both hemp and marijuana.

However, both hemp and marijuana show significant differences with respect to the concentration and relative abundance of these two cannabinoids. Drug varieties, summarily referred to as marijuana, contain in their female flowers typically 2-5% of THC, but THC levels of as high as 15-20% are not uncommon. Industrial hemp varieties, on the other hand, which are licensed for farming in the European Union and Canada, must be bred to maintain a THC content of less than 0.3%. In addition, hemp and marijuana differ in their ratio of THC to CBD. CBD has been shown to block the psychoactivity of THC. Industrial hemp contains more CBD than THC, i.e. has a CBD/THC-ratio of greater than one, while marijuana contains often significantly more THC than CBD. Both the low THC content and the high CBD/THC ratio make industrial hemp unsuitable for producing psychoactive effects when smoked or eaten. The high CBD concentration also makes the theoretically conceivable concentration and recovery of THC in hemp technically difficult and economically unfeasible.

These critical distinctions are the core of the hemp industry's position.

The U.S. Code (21 CFR 802 [16]) as currently enforced defines "marihuana" as *Cannabis Sativa* L. and prohibits it from being grown in the U.S., regardless of its cannabinoid content. However, individual parts of the plant may be imported, except for foliage, seeds that can germinate or resins that can be concentrated. The lack of distinction between hemp and marijuana is the source of the current roadblock in federal government approval of hemp. As well, the current anti-drug environment has prompted U.S. officials to de facto modify or even ignore their own laws, and most recently propose changes to the current regulations to remove some of the exemptions in an already misguided law.

The government has a history of changing its position and rationale for hemp prohibition, in many cases, often tripping over its own contradictory rhetoric. Fortunately, at the time of this writing, "Drug Czar" Gen. Barry McCaffrey of the Office of National Drug Control Policy (ONDCP) has recently announced his

resignation. It is hoped that U.S. government policy toward industrial hemp will change to reflect the facts discussed herein. Nevertheless, should his successor adhere to the same ill-conceived policies of the past, the following examines the uninformed and specious arguments traditionally used to maintain hemp prohibition.

“Hemp sends the wrong message to children”

This is a statement made by ONDCP, both in public and in private interviews. This agency reasons that the idea of hemp being used for so many practical applications sends a contrary message to youth at a time when the ONDCP is campaigning on the evils of marijuana. The argument goes: if a child sees a hemp shoe, s/he may think hemp is cool and since hemp and marijuana are the “same” (by the government’s own self-sealing logic) think likewise of marijuana.

In fact, it is the current refusal of the ONDCP and DEA to distinguish between an agricultural crop and a drug crop that is sending the wrong message to children. A new information-enabled generation is rapidly learning the truth about industrial hemp and will become far more skeptical of the government’s pronouncements as time passes. This presents a credibility problem in the government’s efforts to educate children about the real dangers associated with drugs such as heroin and crack cocaine, a far more important job of the ONDCP and DEA.

“Hemp will confuse law enforcement officials”

This argument is based on the perception that hemp and marijuana look exactly alike and growers can hide marijuana plants in a hemp field. In fact, hemp is grown for its stalk and seed. Maximizing the yields of hemp requires a high plant density. Thus, seeds are planted close together in long thin rows and the stalks grow very close together. On the other hand, marijuana plants are grown for the buds or flowering tops, which means they are best spaced several feet apart to maximize access to sunlight and thus flower and resin production. This makes it easy to tell the difference between a hemp and marijuana field. It also discredits the notion that hemp fields could be used to camouflage marijuana production. This would be futile since a marijuana plant with insufficient space to flower would either not produce or else be obvious to inspectors.

Further to this point, the argument continues that even though the mature hemp and marijuana plants are markedly different in appearance (marijuana is shorter, full of flowering tops, hemp taller with seeds), the plants look the same in the early stages of growth. This, too, is a weak argument considering the spacing required for either plant to succeed.

In addition to these basic agronomic facts, cross-pollination between hemp and marijuana fields would reduce the THC value of the marijuana, discouraging planting anywhere near hemp fields. Farmers who plant field corn and sweet corn know about cross-pollination all too well. Highly airborne hemp pollen can affect marijuana cultivation many miles away.

Finally, a survey of the thirty-one other industrialized nations, which allow cultivation of industrial hemp and still enforce laws prohibiting marijuana, provides a sense of reason. Law enforcement in these countries has reported few problems caused by the similarity of industrial hemp and marijuana. Crop thefts were common shortly after re-legalization in the U.K. and Canada but quickly subsided once the population realized the difference. Involuntary dispersal of mature hemp seeds through birds and loss during transportation has also produced feral plants in the vicinity of hemp fields. However, although all countries growing hemp do prohibit the cultivation and use of marijuana, law enforcement does not consider hemp farming a serious contributor to the proliferation of marijuana.

“Hemp foods and cosmetics are confounding our federal and corporate drug testing programs”

This argument derives from the possibility that trace elements of THC, known to be present in hemp seeds and oil, may show up in workplace drug tests that have, since the 1980's, become a ubiquitous feature of American life. The truth is that even people who frequently consume food items containing hemp seeds and oil are not likely to fail a workplace urine test for marijuana. While studies in 1997 showed that consuming hemp food may cause a positive test for marijuana, seed cleaning practices in Canada and the EU now achieve THC levels much lower than those found in the mid-1990's. Consequently, a recent toxicological study was commissioned by the Agricultural Research and Development Initiative, a program funded by the Canadian Federal and Manitoba Provincial governments, as well as the North American Industrial Hemp Council. The study monitored concentrations of THC metabolites in the urine of volunteers who consumed THC via hemp oil in various doses representative of the moderate to large-scale daily consumption of hemp food products now available in the U.S. market.

The results clearly demonstrated that users of hemp food products were not likely to exceed the 50ppb (part per billion) screening threshold for the THC metabolite in urine used by most corporate and federal drug tests. Some volunteers exceeded the more stringent 20ppb cutoff used by few employers and law enforcement agencies, yet the routinely conducted confirmation testing, which employs more specific analytical methods, always found the THC metabolite levels much below the respective 10ppb cutoff. Thus, the consumption of hemp foods will not cause positive tests for marijuana as long as the hemp industry maintains current standards of THC levels in hemp seeds and drug testing firms do confirmation testing of urine samples which screen positive. Due to the inefficient transfer of THC through the skin, the likelihood that users of hemp cosmetics may test positive is close to nil.

“There is no market for industrial hemp”

At the height of tensions between the hemp industry and the ONDCP/DEA, the USDA published a report on hemp's potential citing only a “small, thin market” in the U.S. The report indicated that the market already has plenty of alternatives to hemp, suggesting that this was reason enough to continue the ban in the face of alleged enforcement problems. The numbers for retail receipts cited above as well as

that going into industry bear out the fact that there is absolutely a significant market for hemp (Ford's 1999-2000 use of hemp fiber was 5,000,000 lbs. and is expected to triple by 2002). It should also be noted that the USDA study based its findings on import statistics, which only track imports of hemp raw materials and many imported hemp products were not counted in its assessment.

The public's awareness of hemp, the corresponding demand for hemp products and the space devoted to hemp on store shelves has increased every year since 1996. This is remarkable considering that the growth comes in spite of illegal government seizures and border embargoes, unfounded police raids on legitimate hemp stores, misinformation campaigns and most recently the raid and seizure of hemp on the Lakota Sioux's Pine Ridge reservation at Wounded Knee. It is even more remarkable to note that the market has still developed despite these enormous resources being pitted against a largely grass roots industry with limited access to money or sophisticated management, marketing and lobbying.

It is also worth noting that \$500,000,000 is spent annually by the DEA on the *Domestic Cannabis Eradication/Suppression Program*, an anti-marijuana task force which purports to search and destroy marijuana fields. Unfortunately, according to the annual reports on this effort from both the Wisconsin Department of Justice, Division of Narcotics Enforcement (1996) and the DEA National Data Summary (1992), the majority (94-99.9%) of that cut down and destroyed was not marijuana, but in fact *ditchweed* (feral, non-psychoactive hemp). Ironically enough, this *ditchweed* derives from the highly airborne hemp pollen still growing wild from the previously mentioned hemp cultivation efforts during World War II.

Finally, one should really ask why a federal agency would even raise the issue of perceived profitability when determining whether or not a crop should be grown in the U.S. If the contention is made that developing and enforcing regulations for an agricultural crop would require funding that may outweigh the crop's market potential- an argument with no historical precedent- it appears that the government's own records suggest half a billion dollars of taxpayer money is available for reapportionment.

“Hemp is a ‘Stalking Horse’ for the legalization of marijuana”

There can be no doubt that the resurfacing of the information and markets for industrial hemp was brought about by those willing to make bold statements as to its history and versatility and without concern that they would be painted as marijuana advocates- because they were: most notably Jack Herer and his controversial and provocative *The Emperor Wears No Clothes*. There is also no doubt that in the early days of the hemp industry, clothing and accessories often featured the hemp leaf as a clue that it was made from the hemp plant. In turn, this practice raised the ire of anti-drug advocates and legislators who felt that hemp products were, in themselves, promoting marijuana. The result was an unfair scapegoating of the hemp plant as the culprit as opposed to the symbolism itself, which, by the way, appears much more

commonly on T-shirts and fabrics made from more widely available (and environmentally destructive) cotton.

Nearly ten years later, the hemp picture has evolved and the composition of current hemp producers and advocates is much more likely to be farmers, legislators and business people whose primary motivation is the reestablishment of a crop with great economic and environmental promise rather than the legalization of marijuana. Just like every other social and political issue, the hemp issue involves a balancing of competing interests. In this case, the interests of environmental sustainability, bio-regionalism and business must reconcile with the asserted interests of law enforcement. However, rather than rationally weigh the competing interests, those facing the issue have been intimidated by law enforcement into over-regulating hemp for fear of being called “soft on drugs.”

Legislators in thirty-one countries and fifteen states have been able to deal with the hemp issue without being confused by the drug issue, notwithstanding appeals from the DEA, ONDCP and law enforcement. In countries where hemp has been re-legalized, there has not been any significant change in laws concerning marijuana. It is clear that nobody is going to accidentally legalize marijuana.

Poppy seeds provide perspective. Poppy flowers, of which there are dozens of varieties, are popular in backyard gardens. The species *Papaver somniferum* includes many varieties of poppies, only one of which, the “red scarlet” poppy, produces opium and derivative narcotics (such as heroin) from its pods which contain significant amounts of concentrated opiates (primarily morphine and codeine). While the DEA has targeted red scarlets, home gardeners continue to cultivate the other non-opium producing varieties of *Papaver somniferum*. The poppy seeds that are commonly consumed as a condiment in baked goods such as bagels, breads, muffins and cakes derive from one of these other non-opium varieties of *Papaver somniferum*, commonly called the “breadseed poppy.” The Controlled Substances Act specifically exempts the poppy seed as a result of the market for human consumption. Poppy seeds can contain trace amounts of opiates at levels many times higher than THC in hemp seed and these opiates are metabolized into the urine at higher concentration than the trace THC. Concentrating the trace opiates in breadseed poppy seeds to an active level is theoretically possible at enormous cost, effort and inefficiency; however, the DEA and ONDCP have not attempted to ban non-opium variety poppies based on this highly speculative scenario.

Poppy seed bagels and flowers are enjoyed by children of all ages, yet children do not confuse poppy seeds and poppy flowers with smoking opium, nor do they perceive a “message” that opium is good. Home garden and breadseed variety poppy plants look similar to the opium producing red scarlet poppy, yet the DEA seems able to tell the difference. As the trace opiate levels in poppy seeds are higher than the trace THC in hemp seed, eating poppy seeds can produce a false positive for narcotic use on a drug test at the 300 ppb cutoff for opiates in urine; however, government agencies and corporations have adapted by raising the threshold for a test-positive

beyond the level of ambiguity (from 300 ppb to 2000 ppb). The condiment and home gardening markets for poppies are smaller than the potential markets for hemp, yet the DEA has not argued for banning non-opium poppy plants for lack of a large market. Finally, the DEA has not suggested that breadseed and home garden poppies are a threat to the controlled status of opium, in spite of the fact that these plants all share the same genus and species.

Reflection on Americans' daily consumption of poppy seed bagels and muffins along with their morning coffee shows how hollow and baseless law enforcement's arguments are against industrial hemp. The government's conscious denial of established customs and practices with respect to an analogous plant to *Cannabis sativa*, the drug versus non-drug varieties of *Papaver somniferum*, sabotages its own credibility while creating a muddling of logic that deprives our country of a tremendous renewable resource.

Hemp and an Untapped Voting Constituency

It is often remarked that politics makes for strange bedfellows. It is also commonly held that politicians who wish to lead will do well to follow the people. It is an interesting and startling observation, therefore, to note that there exists in this country a remarkably strong voting constituency of people who support industrial hemp. This constituency cuts across demographics of age, class, race and field of industry, yet draws most of its power from resources that politicians have not yet managed to harness.

Speaking broadly, this highly diverse group includes farmers, environmentalists, students, rural labor, minorities, senior citizens, technology entrepreneurs and a wide range of people in traditional industries such as food, medicine, social services and manufacturing whose experience has yielded cynicism and dissatisfaction with the status quo. Another stronghold of constituents is the 18-29 year old age group, the children of the baby boomers and now the largest age group in America as of 1999. These groups have come to view industrial hemp as practical solutions to vexing problems in industry and the environment and have no qualms about expressing their support. The common uniting element between all these people is an education about the facts regarding hemp.

These voters are alternately deeply connected to or alienated from politics and tend to care about real-life social, civil or business issues that do not receive center stage in political debates. They see a damaged society and planet and seek practical, reasonable and sustainable change. Not necessarily beholden to traditional conservative vs. liberal musings, they can quickly distinguish useful ideas from lip service. Politicians who take an active stance on this issue may find themselves surprised and rewarded by this block. Together, they make up a powerful “swing” vote because they are not necessarily tied to one major party or another.

More specifically, America’s 18-29 year old has yet to be wooed by traditional politics. Considering the times influencing their coming of age, they are generally very skeptical of rhetoric without practicality, style without substance. Today’s younger generation is more likely than not to be mistrustful of government as well as the existing social and industrial order. They are the innovators, the activists and the foot soldiers of our age; they are the people that given time will actually turn the promises into reality. Best of all, the vast majority of this age group are unclaimed. Until marriage, home ownership and family life present social and political realities that compel choice, many do not vote and if they do, with little loyalty to party.

This 18-29 year old age group is decidedly educated and supportive when it comes to industrial hemp, more so than any other American generation. A recent survey conducted with 3,500 members of this age segment revealed that 80% supported industrial hemp as a means to curtail deforestation and 60% would vote for a political

candidate who came out in favor of legalizing industrial hemp. At the time of this writing, there are a number of such politicians currently in Congress, with many more running for office. A partial list includes Rep. Tammy Baldwin (D) WI, Rep. Tom Campbell (R) CA, Rep. Barney Frank (D) MA, Rep. Maurice Hinchey (D) NY, Rep. James McDermott (D) WA and Rep. James McGovern (D) MA.

There are other indications that the legalization of hemp farming in the U.S. has become an important consideration for these voters. Within two weeks of Reform Party candidate Jesse Ventura appearing in the debates and announcing his support for industrial hemp during his race for Governor of Minnesota, his poll numbers soared from 7% to 38%, in part due to support for this issue. During the election, Ventura caused the largest registration of 18-29 year olds in U.S. history, on his way to a remarkable victory over the status quo. Today, Minnesota democrats have since dropped their opposition and now include industrial hemp as part of their platform, lest they end up on the wrong side of a strong issue. During the current presidential election, clear support for industrial hemp has been voiced by the Green Party and the Libertarian Party, with the Democrats and Republicans not yet taking a position.

Industrial hemp bills have been passed in North Dakota, Hawaii, Minnesota, Illinois and Maryland. Industrial hemp resolutions have been passed in Arizona, California, Kentucky, Montana, Virginia and Vermont. Legislation is in process in South Dakota, Iowa, Maine, New Hampshire, New Mexico, Oregon and Tennessee. Voter initiatives have taken place in Alaska, Colorado and Missouri.

While the mainstream media continues to avoid or tread lightly with regard to these facts, a powerful, silent, largely untapped voting block sits ready, willing and able to put politicians into office who espouse these views for the right reasons. Supporting industrial hemp means supporting true reform because it is inherently local and environmentally friendly in nature, values that are becoming increasingly important to American voters. It also means for many voters an opportunity to show their growing dismay with an irrational, overreacting and unproductive governmental policy towards any subject that happens to get close to the issue of drug control.

Conclusion

At the dawn of a new century, Americans must begin to ask more questions about the nature of our political, economic and social systems. Have we truly maintained the ideals of the Constitution and the Bill of Rights or have these been sacrificed at the altar of political expediency? Have we maintained and increased our resources to the benefit of our people or have we allowed them to be squandered by a small few who happen to influence the lawmakers that permit them such license? What are the likely consequences of our present path and what is the price of doing nothing?

More specifically, let us ask why the federal government has prevented any enactment of the aforementioned state hemp legislation. The pretense for sixty years has been that hemp is the same as marijuana, a “dangerous drug.” Unfortunately, the contention that marijuana is dangerous has yet to be reconciled with the fact that there has never been one recorded case in human history of anyone dying of this drug. Indeed, in 1988, the DEA's Administrative Law Judge Francis Young concluded:

“In strict medical terms marijuana is far safer than many foods we commonly consume. For example, eating 10 raw potatoes can result in a toxic response. By comparison, it is physically impossible to eat enough marijuana to induce death. Marijuana in its natural form is one of the safest therapeutically active substances known to man. By any measure of rational analysis marijuana can be safely used within the supervised routine of medical care.”

Since “danger” is the core of the argument used to deprive industrialists and farmers of profits, voters of the democratic process and humanity of nature's gifts, the hemp industry is forced into the awkward situation of having to either ignore or else defend marijuana's relatively benign nature. Regardless of which position is taken, both create political opportunities for hemp's detractors.

Industrial hemp is the most versatile crop on earth and has been for thousands of years. It makes markets in industries currently plagued by environmental chaos, providing solutions as well as profits. The proper use of this crop will encourage the development of social, economic and political systems that return the power over land use to the people who live and work on it and will create broad based regional prosperity and independence. The arguments used against hemp are based on ignorance and misinformation. One only needs to look to Canada, Asia or Europe for workable economic and law enforcement models. There is a giant, untapped voting block of hemp-educated Americans who have the power to elect politicians that will work to create and protect the rights that allow its cultivation. There is nothing else to keep America from joining the rest of the industrialized world in hemp cultivation except overcoming the contention that “hemp is marijuana, a dangerous drug”- a fiction which continues to justify the hemp ban and which now must be brought to light by asserting the truth.

History, research and modern experience have established that hemp can provide a remarkably wide range of benefits for humans and their environment. All that remains is to accept it and move forward. With broad-based political support behind us and environmental renewal and a potential economic bonanza before us, the choice to fully deregulate and commercialize the entire hemp plant is clearly one of common sense.

Bibliography

Janet N. Abramovitz and Ashley T. Mattoon. *Paper Cuts: Recovering the Paper Landscape*. WorldWatch Institute, 1999.

Ivan Bocsa and Michael Karus. *The Cultivation of Hemp: Botany, Varieties, Cultivation and Harvesting*. HempTech Publications, Sebastopol, CA, 1998.
2nd, completely revised German edition, *Landwirtschaftsverlag*, Münster-Hiltrup, 2000.

Lyster H. Dewey. Article on Hemp. United States Department of Agriculture Yearbook, Pages 541-554, 1901.

Peter Dragla. *Perceivable Differentiation Between Industrial Hemp and Marijuana Revealed by DG Test*. Ridgetown College/University of Guelph, Ridgetown and Industrial Hemp Seed Development Company, Pain Court, Ontario, Canada, 1999

Udo Erasmus. *Fats that Heal, Fats that Kill*. Alive Books Publishing, Burnaby, B.C., Canada, 2nd Edition, 1993

Gero Leson, Petra Pless and John W. Roulac. *Hemp Foods & Oils for Health*. HempTech Publications, Sebastopol, CA. 2nd revised edition, 1999.

Gero Leson and Petra Pless. *Evaluating Interference of THC in Hemp Food Products With Employee Drug Testing*. Study Summary. Leson Environmental Consulting, Berkeley, CA. July 2000.

Available at: www.naihc.org/hemp_information/content/THC_emp_drug_testing.html
Full manuscript submitted for publication to the *Journal of Analytical Toxicology*.

George C. Meadway C, R. Braithwaite Regional Laboratory for Toxicology, City Hospital NHS Trust, Birmingham, UK. "Opiate concentrations following the ingestion of poppy seed products--evidence for 'the poppy seed defence' " *Forensic Sci Int* 1998 Aug 31; 96(1):29-38

Suzanne Montfort and Ernest Small. A comparison of the biodiversity friendliness of crops with special reference to hemp (*Cannabis sativa* L.). *Journal of the International Hemp Association*. Vol. 6, No.2, 53-63

National Data Summary from The Domestic Cannabis Eradication/Suppression Program, U.S. Department of Justice, Drug Enforcement Administration, 1992.

Robert A. Nelson. *Hemp Husbandry*. Rex Research Archives, 1999.

nova Institute. *Study on Markets and Price Situation of Natural Fibres (Germany and EU)*. Commissioned by: Fachagentur Nachwachsende Rohstoffe e.V. Project No. 99NR163. Hürth, Germany, March 2000.

nova Institute. Proceedings of the 3rd BIORESOURCE HEMP SYMPOSIUM, Wolfsburg, Germany, September 13 –16, 2000. <http://www.bioresource-hemp.de/>

PaoloRanalli, (Ed.). *Advances in Hemp Research*. Food Products Press, New York/London, 1999.

John Roulac. *Hemp Horizons*. Chelsea Green Publishing Company, White River Junction, VT, 1997.

Gordon Scheifele. *Report on Exploring the Feasibility of Growing Industrial Low THC in Northwestern Ontario, Canada*. University of Guelph, Thunder Bay, Ontario, Canada, 1998.

V.P. Stynik and A.F. Stelmah. "The Character of Inheritance of Differences in Cannabinoid Content in Hemp (*Cannabis sativa* L.)." *Journal of the International Hemp Association*. Vol. 6, No. 1, 8-9, 1999.

Michael L. Smith, Eric T. Shimomura, Jacquelyn Summers, and Buddha D. Paul
Division of Forensic Toxicology, Office of the Armed Forces Medical Examiner, Armed Forces Institute of Pathology, Washington, D.C. "Detection Times and Analytical Performance of Commercial Urine Opiate Immunoassays Following Heroin Administration" *Journal of Analytical Toxicology*, ISSN 0146-4760, Volume 24, Number 7, October, pp. 522-529

Barrie Webster, *Nutraceuticals in Manitoba Industrial Hemp*. Project 'ARDI 98-161'. Final Report June 4, 1999

Taxation of Marihuana. Hearings Before the House Committee on Ways and Means on H.R. 6385, 75th Congress 1st Session 8, 1937.

US Department of Justice, Drug Enforcement Agency, "In the Matter of Marijuana Rescheduling Petition," [Docket #86-22], (September 6, 1988), p. 57.

David West. *Hemp and Marijuana: Myths and Realities*. Prepared for the North American Industrial Hemp Council, 1998.

Wisconsin Data from Cannabis Enforcement and Suppression Effort, Annual Report. Wisconsin State Dept. of Justice, Division of Narcotics Enforcement, 1996.

Hemp Internet Resources

About Hemp.Com	www.abouthemp.com
Global Hemp News Service	www.globalhemp.com
Hemp History Library	www.hempology.org
Hemp Industries Association	www.thehia.org
North American Industrial Hemp Council	www.naihc.org
Vote Hemp.Com	www.votehemp.com

Health Canada. Commercial Cultivation of Industrial Hemp, Policy Paper, 1997.
Executive Summary available online at:
<http://www.hc-sc.gc.ca/hpb-dgps/therapeut/htmleng/hemp.html>

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Hemp Processing & Marketing

