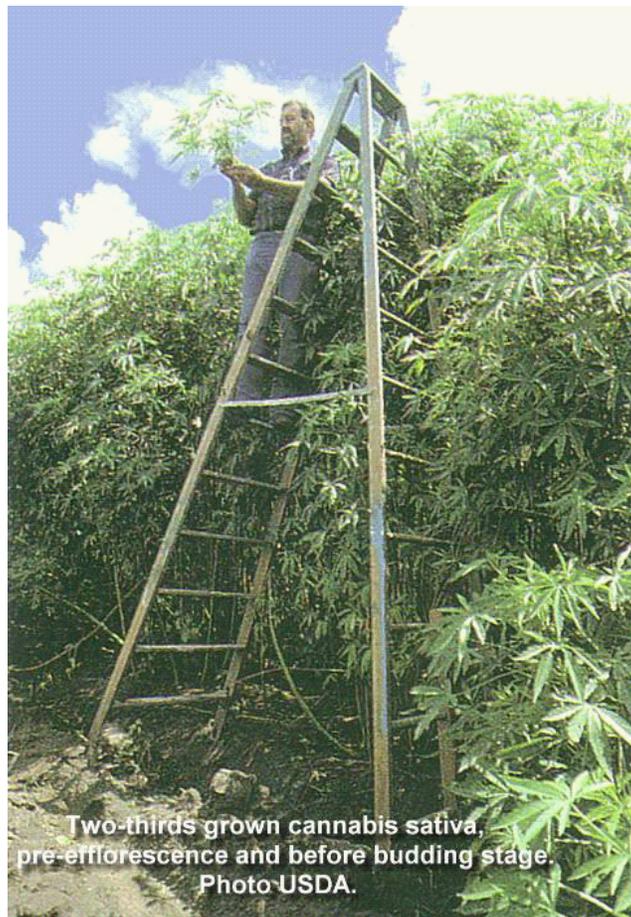


The Politics of Hemp

*How it can save
America*



Two-thirds grown cannabis sativa,
pre-efflorescence and before budding stage.
Photo-USDA.

The Marijuana Conspiracy - The reason hemp is illegal

Posted March 20th, 2009 by Dan Hughes



(Nothing to do with its effects on the mind and body)

By Doug Yurchey - Article from [The Dot Connector](#)

They say marijuana is dangerous. Pot is not harmful to the human body or mind. Marijuana does not pose a threat to the general public. Marijuana is very much a danger to the oil companies, alcohol, tobacco industries and a large number of chemical corporations. Big businesses, with plenty of dollars and influence, have suppressed the truth from the people. The truth is, if marijuana was utilized for its vast array of commercial products, it would create an industrial atomic bomb! The super rich have conspired to spread misinformation about the plant that, if used properly, would ruin their companies.

Where did the word 'marijuana' come from? In the mid 1930s, the M-word was created to tarnish the good image and phenomenal history of the hemp plant – as you will read. The facts cited here, with references, are generally verifiable in the *Encyclopedia Britannica* which was printed on hemp paper for 150 years:



✓ All schoolbooks were made from hemp or flax paper until the 1880s. (Jack Frazier. *Hemp Paper Reconsidered*. 1974.)

✓ It was *legal to pay taxes with hemp* in America from 1631 until the early 1800s. (*LA Times*. Aug. 12, 1981.)

✓ *Refusing to grow hemp* in America during the 17th and 18th centuries was *against the law!* You could be jailed in Virginia for refusing to grow hemp from 1763 to 1769 (G. M. Herdon. *Hemp in Colonial Virginia*).

✓ George Washington, Thomas Jefferson and other founding fathers *grew hemp*. (Washington and Jefferson Diaries. Jefferson smuggled hemp seeds from China to France then to America.)

✓ Benjamin Franklin owned one of the first paper mills in America, and it processed hemp. Also, the War of 1812 was fought over hemp. Napoleon wanted to cut off Moscow's export to England. (Jack Herer. *Emperor Wears No Clothes*.)

✓ For thousands of years, 90% of all ships' sails and rope were made from hemp. The word 'canvas' is Dutch for *cannabis*. (*Webster's New World Dictionary*.)

✓ 80% of all textiles, fabrics, clothes, linen, drapes, bed sheets, etc., were made from hemp until the 1820s, with the introduction of the cotton gin.

✓ The first Bibles, maps, charts, Betsy Ross's flag, the first drafts of the Declaration of Independence and the Constitution were made from hemp. (*U.S. Government Archives*.)

✓ The first crop grown in many states was hemp. 1850 was a peak year for Kentucky producing 40,000 tons. Hemp was the largest cash crop until the 20th century. (*State Archives*.)

- ✓ Oldest known records of hemp farming go back 5000 years in China, although hemp industrialization probably goes back to ancient Egypt.
- ✓ Rembrandt's, Van Gogh's, Gainsborough's, as well as most early canvas paintings, were principally painted on hemp linen.
- ✓ In 1916, the U.S. Government predicted that by the 1940s all paper would come from hemp and that no more trees need to be cut down. Government studies report that 1 acre of hemp equals 4.1 acres of trees. Plans were in the works to implement such programs. (*U.S. Department of Agriculture Archives.*)
- ✓ Quality paints and varnishes were made from hemp seed oil until 1937. 58,000 tons of hemp seeds were used in America for paint products in 1935. (Sherman Williams Paint Co. testimony before the U.S. Congress against the 1937 Marijuana Tax Act.)
- ✓ Henry Ford's first Model-T was built to run on *hemp gasoline* and the car *itself was constructed from hemp!* On his large estate, Ford was photographed among his hemp fields. The car, 'grown from the soil,' had hemp plastic panels whose impact strength was 10 times stronger than steel. (*Popular Mechanics, 1941.*)
- ✓ In 1938, hemp was called '*Billion Dollar Crop.*' It was the first time a cash crop had a business potential to exceed a billion dollars. (*Popular Mechanics, Feb. 1938.*)
- ✓ *Mechanical Engineering Magazine* (Feb. 1938) published an article entitled '*The Most Profitable and Desirable Crop that Can be Grown.*' It stated that if hemp was cultivated using 20th century technology, it would be the single largest agricultural crop in the U.S. and the rest of the world.

The following information comes directly from the United States Department of Agriculture's 1942 14-minute film encouraging and instructing 'patriotic American farmers' to grow 350,000 acres of hemp each year for the war effort:

"...[When] Grecian temples were new, hemp was already old in the service of mankind. For thousands of years, even then, this plant had been grown for cordage and cloth in China and elsewhere in the East. For centuries prior to about 1850, all the ships that sailed the western seas were rigged with hempen rope and sails. For the sailor, no less than the hangman, hemp was indispensable... Now with Philippine and East Indian sources of hemp in the hands of the Japanese... American hemp must meet the needs of our Army and Navy as well as of our industries... The Navy's rapidly dwindling reserves. When that is gone, American hemp will go on duty again; hemp for mooring ships; hemp for tow lines; hemp for tackle and gear; hemp for countless naval uses both on ship and shore. Just as in the days when Old Ironsides sailed the seas victorious with her hempen shrouds and hempen sails. Hemp for victory!"

Certified proof from the Library of Congress, found by the research of Jack Herer, refutes claims of other government agencies that the 1942 USDA film '*Hemp for Victory*' did not exist.

Hemp cultivation and production do not harm the environment. The USDA Bulletin #404 concluded that hemp produces four times as much pulp with at least four to seven times less pollution.

From *Popular Mechanics*, February 1938:

"It has a short growing season... It can be grown in any state... The long roots penetrate and break the soil to leave it in perfect condition for the next year's crop. The dense shock of leaves, 8 to 12 feet above the ground, chokes out weeds. ...Hemp, this new crop can add immeasurably to American agriculture and industry." In the 1930s, innovations in farm machinery would have caused an industrial revolution when applied to hemp. This single resource could have created millions of new jobs generating thousands of quality products. Hemp, if not made illegal, would have brought America out of the Great Depression.

THE CONSPIRACY

William Randolph Hearst (Citizen Kane) and the Hearst Paper Manufacturing Division of Kimberly Clark owned vast acreage of timberlands. The Hearst Company supplied most paper products. Patty Hearst's grandfather, a destroyer of nature for his own personal profit, stood to lose billions because of hemp.

In 1937, DuPont patented the processes to make plastics from oil and coal. DuPont's Annual Report urged stockholders to invest in its new petrochemical division. Synthetics such as plastics, cellophane, celluloid, methanol, nylon, rayon, Dacron, etc., could now be made from oil. Natural hemp industrialization would have ruined over 80% of DuPont's business.

Andrew Mellon became Hoover's Secretary of the Treasury and DuPont's primary investor. He appointed his future nephew-in-law, Harry J. Anslinger, to head the Federal Bureau of Narcotics and Dangerous Drugs.

Secret meetings were held by these financial tycoons. Hemp was declared dangerous and a threat to their billion dollar enterprises. For their dynasties to remain intact, hemp had to go. These men took an obscure Mexican slang word: 'marijuana' and pushed it into the consciousness of America.

MEDIA MANIPULATION

A media blitz of 'yellow journalism' raged in the late 1920s and 1930s. Hearst's newspapers ran stories emphasizing the horrors of marijuana. The menace of marijuana made headlines. Readers learned that it was responsible for everything from car accidents to loose morality.

Films like *Reefer Madness* (1936), *Marijuana: Assassin of Youth* (1935) and *Marijuana: The Devil's Weed* (1936) were propaganda designed by these industrialists to create an enemy. Their purpose was to gain public support so that anti-marijuana laws could be passed.

Examine the following quotes from *The Burning Question*, aka *Reefer Madness*:

- a violent narcotic;
- acts of shocking violence;
- incurable insanity;
- soul-destroying effects;
- under the influence of the drug he killed his entire family with an ax;
- more vicious, more deadly even than these soul-destroying drugs (heroin, cocaine) is the menace of marijuana!

Reefer Madness did not end with the usual 'the end.' The film concluded with these words plastered on the screen: 'Tell your children.'

In the 1930s, people were very naive, even to the point of ignorance. The masses were like sheep waiting to be led by the few in power. They did not challenge authority. If the news was in print or on the radio, they believed it had to be true. They told their children, and their children grew up to be the parents of the baby boomers.

On April 14, 1937, the prohibitive Marijuana Tax Law, or the bill that outlawed hemp, was directly brought to the House Ways and Means Committee. This committee is the only one that can introduce a bill to the House floor without it being debated by other committees. The Chairman of the U.S. Senate, Ways and Means Committee, at the time, Robert Doughton, was a *DuPont* supporter. He insured that the bill would pass Congress.

Dr. James Woodward, a physician and attorney, testified too late on behalf of the American Medical Association. He told the committee that the reason the AMA had not denounced the Marijuana Tax Law sooner was that the Association had just discovered that marijuana was hemp.

Few people, at the time, realized that the deadly menace they had been reading about on Hearst's front pages was in fact passive hemp. The AMA understood cannabis to be a *medicine* found in numerous healing products sold over the last hundred years.

In September of 1937, hemp became illegal. The most useful crop known became a drug and our planet has been suffering ever since.

Congress banned hemp because it was said to be the most violence-causing drug known. Harry Anslinger, head of the Drug Commission for 31 years, promoted the idea that marijuana made users act extremely violent. In the 1950s, under the Communist threat of McCarthyism, Anslinger then said the exact opposite: marijuana will pacify you so much that soldiers would not want to fight.

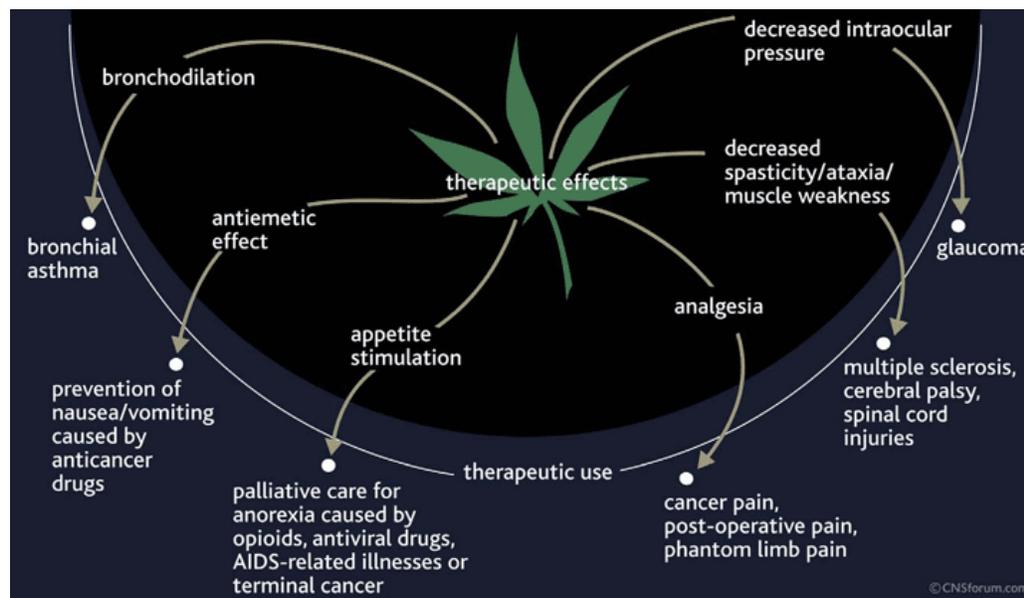
Today, our planet is in desperate trouble. Earth is suffocating as large tracts of rain forests disappear. Pollution, poisons and chemicals are killing people. These great problems could be reversed if we industrialized hemp. Natural biomass could provide all of the planet's energy needs that are currently supplied by fossil fuels. We have consumed 80% of our oil and gas reserves. We need a renewable resource. Hemp could be the solution to soaring gas prices.

THE WONDER PLANT

Hemp has a higher quality fiber than wood fiber. Far fewer caustic chemicals are required to make paper from hemp than from trees. Hemp paper does not turn yellow and is very durable. The plant grows quickly to maturity in a season where trees take a lifetime.

All plastic products should be made from hemp seed oil. Hempen plastics are biodegradable! Over time, they would break down and not harm the environment. Oil-based plastics, the ones we are very familiar with, help ruin nature. They do not break down and will do great harm in the future. The process to produce the vast array of natural (hempen) plastics will not ruin the rivers as *DuPont* and other petrochemical companies have done. Ecology does not fit in with the plans of the oil industry and the political machine. Hemp products are safe and natural.

Medicines should be made from hemp. We should go back to the days when the AMA supported cannabis cures. 'Medical Marijuana' is given out legally to only a handful of people while the rest of us are forced into a system that



relies on chemicals. Pot is only healthy for the human body.

World hunger could end. A large variety of food products can be generated from hemp. The seeds contain one of the highest sources of protein in nature. Also: They have two essential fatty acids that clean your body of cholesterol. These essential fatty acids are not found anywhere

else in nature! Consuming pot seeds is the best thing you could do for your body. Eat uncooked hemp seeds.

Clothes should be made from hemp. Hemp clothing is extremely strong and durable over time. You could hand clothing, made from pot, down to your grandchildren. Today, there are American companies that make hemp

clothing; usually 50% hemp. Hemp fabrics should be everywhere. Instead, they are almost underground. Superior hemp products are not allowed to advertise on fascist television.

Kentucky, once the top hemp producing state, made it *illegal to wear* hemp clothing! Can you imagine being thrown into jail for wearing quality jeans?

The world is crazy. But that does not mean you have to join the insanity. Get together. Spread the news. Tell people, and that includes your children, the truth. Use hemp products. Eliminate the word 'marijuana.' Realize the history that created it. Make it politically incorrect to say or print the M-word. Fight against the propaganda (designed to favor the agenda of the super rich) and the bullshit. Hemp must be utilized in the future. We need a clean energy source to save our planet. *Industrialize hemp!*

The liquor, tobacco and oil companies fund more than a million dollars a day to Partnership for a Drug-Free America and other similar agencies. We have all seen their commercials. Now, their motto is: '*It's more dangerous than we thought.*' Lies from the powerful corporations, that began with Hearst, are still alive and well today.

The brainwashing continues. Now, the commercials say: If you buy a joint, you contribute to murders and gang wars. The latest anti-pot commercials say: If you buy a joint... you are promoting terrorism! The new enemy (*terrorism*) has paved the road to brainwash you any way they see fit.

There is only one enemy: the friendly people you pay your taxes to, the war-makers and nature destroyers. With your funding, they are killing the world right in front of your eyes.

Half a million deaths each year are caused by tobacco. Half a million deaths each year are caused by alcohol. No one has ever, ever died from smoking pot!!

In the entire history of the human race, not one death can be attributed to cannabis. Our society has outlawed grass but condones the use of the *killers*: tobacco and alcohol.

Hemp should be declassified and placed in drug stores to relieve stress. Hardening and constriction of the arteries are bad, but hemp usage actually enlarges the arteries, which is a healthy condition. We have been so conditioned to think that smoking is harmful. That is not the case for passive pot.

Ingesting THC, hemp's active agent, has a positive effect: relieving asthma and glaucoma. A joint tends to alleviate the nausea caused by chemotherapy. You are able to eat on hemp. This is a healthy state of being.

[one personal note. During the pregnancy of my wife, she was having some difficulty gaining weight. We were in the hospital. A nurse called us to one side and said: "*Off the record, if you smoke pot... you'd get something called the munchies and you'll gain weight.*" I swear that is a true story.]

The stereotype for a pothead is similar to a drunk, bubble-brain. Yet, the truth is one's creative abilities can be enhanced under its influence. The perception of time slightly slows and one can become more sensitive. You can more appreciate all arts, be closer to nature and generally *feel* more under the influence of cannabis. It is, in fact, the exact opposite state of mind and body as the drunken state. You can be more aware with pot.

The pot plant is an *alien* plant. There is physical evidence that cannabis is not like any other plant on this planet. One could conclude that it was brought here for the benefit of humanity. Hemp is the *only* plant where the males appear one way and the females appear very different, physically!

No one ever speaks of males and females in regard to the plant kingdom because plants do not show their sexes. Except for cannabis. To determine what sex a certain, normal, earthly plant is, you have to look internally, at its DNA. A male blade of grass (physically) looks exactly like a female blade of grass. The hemp plant has an intense sexuality. Growers know to kill the males before they fertilize the females. Yes, folks, the most potent pot comes from 'horny females.'

The reason this amazing, very sophisticated, ET plant from the future is illegal has nothing to do with how it physically affects us.

Pot is illegal because billionaires want to remain billionaires!

"And I will raise up for them a plant of renown, and they shall be no more consumed with hunger in the land." – Ezekiel 34:29.

p.s. I think the word 'drugs' should not be used as an umbrella-word that covers all chemical agents. Drugs have come to be known as something bad. Are you aware there are legal drugstores?! Yep, in every city. Unbelievable. Each so-called drug should be considered individually. Cannabis is a medicine and not a drug. We should dare to speak the truth no matter what the law is.

I suspect it's true that hemp can be used to end hunger, treat/cure many diseases, end poisonous cotton industry, replace oil for plastics, and halt deforestation, and if we're talking about the US, just a few percent of the fallow land is supposedly enough to make energy for the whole country (cars, electricity, etc). It would be a serious blow to the oligarchy and their tyrannical centralization plans. Look at the unscrupulous methods they used to criminalize it. (Anslinger / Hearst)!

FROM: [fleskebille](#)

Watch: *The Hemp Revolution*

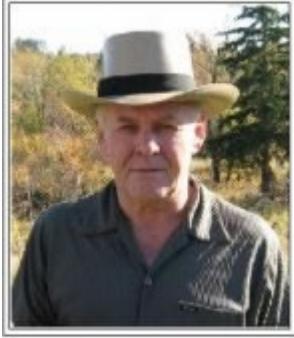
September 09, 2008

Making a hemp advocacy documentary is an uphill cinematic battle because of the unintentional humor that surfaces. It is difficult to keep a straight face when you're told that hemp can be used to build "anything from a 2x4 to the body of a stealth jet bomber"; or how hemp packaging would allow you to "eat the container for dessert" in fast-food joints; or that commercial hemp could be "the greatest economic engine in the history of the human race." Of course, the truth is that these assertions are perfectly legitimate. Unfortunately, hemp has become so marginalized in our society that the myriad benefits of the substance appear as ridiculous pipe dreams, when in fact they are achievable realities. Australian producer-director Anthony Clarke does a commendable job in researching and outlining hemp's numerous strengths. He loosely divides his work into six sections--hemp for paper, textiles, fuel, medicine, and "inspiration" and the U.S. government's role in squelching all of these uses--supplying substantial and convincing evidence throughout. Clarke also puts hemp in its proper historical context and examines the combination of dubious forces--DuPont, Hearst, racist groups, and a commissioner of narcotics named Harry Anslinger, who had time (and idle employees) on his hands because of the repeal of prohibition--that led to hemp's criminalization in 1938. Clarke talks with a range of people to illustrate his points, from well-known authorities such as Dr. Lester Grinspoon and Dr. Andrew Weil to the head of the Netherlands' drug policy to Everyman hemp-seed chefs and hemp outfitters.

WATCH THE VIDEO:

<http://www.youtube.com/watch?v=710EmFfLWDg&feature=Playlist&p=EE448A9F68EAE205&index=0&playnext=1>





My name is Rick Simpson.

Throughout man's history hemp has always been known as the most medicinal plant in the world. Even with this knowledge hemp has always been used as a political and religious football.

WATCH *RUN FROM THE CURE*: http://www.youtube.com/watch?v=0psJhQHk_GI

Hemp Medicine's Emperor's Political Exile in Europe

- a message from Rick Simpson

On November 25th, 2009, one day before I was crowned the Freedom Fighter of the Year 2009 at the Cannabis Cup in Amsterdam, I received a word that I have been raided again by the RCMP. I contacted Tim Hunter at the Amherst attachment and asked I was being charged. Of course, he refused to give me straight answer. All he would say was that the RCMP wanted to talk to me.

After openly growing hemp in my backyard this past summer and announcing this fact to the public on tom Young's open line talk show in June, how could the RCMP not be aware of my activities? The truth is they knew exactly what I was doing. RCMP officers were even sending people that needed help to me. I can only surmise that the purpose of this raid was to keep me from returning to Canada.

If I return home, I will be arrested and put in jail without bail or medicine. I am not afraid of their jails but I cannot go without my medicine, the system has nothing that could help me with my conditions. So for me to return to Canada would be like committing suicide. I would be thrown in jail and denied my medicine and a short time later you would hear in the news that Rick Simpson died of natural causes. I cannot tell the people of Canada who are depending on my presence to help their medical conditions how sorry I am. But it was not me who caused this situation.

It seems the goal is to keep me from returning home and they succeeded. But to what end? All hemp magazines on this planet are now telling their readers how to heal themselves with this wonderful medicine. If governments want to live in denial, it will be short-lived. We are gaining tens of thousands of followers every day. You cannot stop the truth.

For me, going to the Cannabis Cup was a great adventure and I would like to thank Greenhouse Seeds for making this trip possible. To stand before hundreds of people and being crowned as the Freedom Fighter of the Year was a great honour. But it is an honour that comes with a price. Most people who have worn the tricorn hat have gone to jail for spreading the truth.

To have this honour bestowed on me and to join the ranks of people like Jack Herer and Eddy Lepp has given my life even more purpose.

Jack Herer believed as I do that the key to hemp's complete legalisation is in the magnificent medicine this plant can produce. Once the public becomes aware of the fact that properly made hemp medicine can cure or control practically any medical condition, who is going to stand against the use of hemp?

I must also mention the great work done by Steve Hagar and High Times magazine. Cannabis cures cancer right on their cover. It is so refreshing to know that the system has no control over hemp publications. What a shame are so-called free press and news media refuse to print the truth.

I must also tip my tricorn hat to the Weed World out of the UK. They were the first hemp magazine to cover my work. They even released a special edition in September 2009 featuring a number of articles that I wrote about hemp medicine and other aspects of the hemp movement. I must also acknowledge the great work done by Bayer & Romsy Hemp Cosmetics and Konoptikum hemp magazine of the Czech Republic. This publication has also done much to spread the truth about hemp in Europe.

Presently, I am staying with friends in Europe but it saddens me to be unable to be with my family and loved ones during Christmas. For the time being, it seems I will be seeking asylum in Europe. This may not be a bad thing since seminars about hemp oil are being arranged in many countries. I hate to go begging but if anyone out there has an extra few dollars they can donate to us, it would greatly ease the burden on me. Of course it costs money to live in Europe and we are expending a great deal putting on seminars and spreading the word. So any help you could provide would be greatly appreciated.

They say everything happens for a reason, so I will simply put my head down and continue forward. To anyone in Canada or the US requiring help, simply follow the information we provided at www.phoenixtears.ca. Almost anyone can produce this medicine without difficulty, if they follow the instructions. Again, I apologize to everyone for not returning. But as you can see, my hands are tied.

We are at the dawn of new age in medicine and a new day for mankind. Not only can hemp save the world, it can eliminate a great deal of human suffering and can even put an end to starvation. What are we waiting for? Join with me and let us put an end to this madness. It can only survive if we continue to sit on our backsides and do nothing. Stand up and be counted and let us give ourselves a chance to heal.

Best wishes,
Rick Simpson

The current restrictions against hemp were put in place and maintained, not because hemp is evil or harmful, but for big money to make more big money, while we suffer and die needlessly. Look at a proposal such as this; if we were allowed to grow hemp in our back yards and cure our own illnesses, what do you think the reaction of the pharmaceutical industry would be to such a plan? Many large pharmaceutical companies that still exist today sold hemp based medicines in the 1800's and early 1900's. They knew then what I have recently found out. Hemp oil if produced properly is a cure-all that the pharmaceutical industry can't patent.

Two years ago I contacted the Liberals, the Conservatives and the New Democratic Party about this situation. I also provided them with evidence to back up what I was saying. No one lifted a finger, in most cases I was lucky to get a reply. I contacted the R.C.M.P. along with many other organizations and Public Interest TV shows, with little or no response.

Why are all these people trying to avoid such a simple truth? If I am in some way wrong in what I have been saying then I invite the system to come and prove it. I would be happy to put on a public demonstration of what this oil can do. That would answer this question for the Canadian public once and for all. It seems unbelievable that we have a law in Canada that will not allow us to cure our own diseases with a natural herbal remedy.

While much of the evidence for the effectiveness of Hemp is reports from patients and doctors, it is important to realize that this reporting leads to restrictions of drugs and their withdrawal from the market. Such was the case with doctors reporting the birth defects from Thalidomide and heart problems with the Fen-Phen combination of drugs. Further reports led to new uses for Thalidomide as a drug to treat leprosy rather than morning sickness. Anecdotal evidence (reports and observation by patients or doctors) usually indicates to a doctor that a treatment or drug should

be altered, discontinued or changed.

In addition to the evidence, much research has been done and a list of a few of the researchers and their papers or publications is here. [Penicillin was approved for use with less experience and data than is available on the effectiveness of Hemp - only six patients].

The results of the cases can be readily replicated by any practitioner, medical or otherwise, anywhere, to cure malignant melanomas and more importantly, save lives. The topical application of hemp oil salves or balms helps to control or cure various skin conditions. Taken orally, the oil tends to seek out and destroy cancer cells in the body, but as with any drug, too much can cause side effects; most notable with hemp oil is drowsiness. Unlike opiates and their derivatives, hemp oil is not addictive.

For those who may find it incredible that the medical establishment would ignore or even disdain such research we remind the reader that the history of the medical establishment includes examples of mule-like stubbornness, incompetence, mediocrity, greed, arrogance, and stupidity. Consider the case of Dr. Ignas Semmelweis:

In 1847, Dr. Semmelweis, a respected Hungarian physician who was concerned about the high mortality rate of women giving birth in hospital, instituted a procedure at one hospital whereby doctors washed and disinfected their hands before delivering babies. Immediately, the mortality rate dropped from THIRTY percent to near zero. Seven other hospitals followed suit with similar results.

The European medical establishment recognized Dr. Semmelweis's achievement by blocking his applications for further research funds, vilifying and ostracizing him, and, ultimately, causing him to lose his prestigious positions at maternity hospitals. In America, the newly formed American Medical Association added insult to injury by threatening to revoke the license of any doctor caught washing his hands. Dr. Semmelweis was so distressed that women continued to die that he suffered a mental breakdown that eventually led to his death in 1865.

Don't expect a doctor working inside the system to buck the system. The risks are still too great!

The advice she or he offers you is controlled by the large medical industry that makes its money from expensive cancer fighting drugs and treatments. It is an industry that doesn't look favorably on natural supplements or other cancer treatments that they cannot patent or make a large profit from. Years from now the current conventional cancer treatments used by doctors will on the whole be viewed in the same light that we view the old medical practice of blood-letting to cure illnesses.

Man Heralded for Curing Cancer Seeks Asylum in Europe

Bonnie King Salem-News.com

Canadian authorities have still not laid charges ten days after the police action.

(SALEM, Ore.) - There's a man from Athol, Nova Scotia, Canada who has caused a stir around the world. About five years ago, he made the shocking claim to have cured cancer. As unbelievable as that sounds, there is viable evidence to support his claim.

You may not have heard of Rick Simpson, many people have not yet had the chance. He's well known globally in the cannabis community, but the general public has been slow in receiving his whole story.

Simpson makes and distributes a medicinal cannabis extract popularly known as "hemp oil". He does so without any profit motive. Many patients have claimed to be cured of their ailments, often terminal cancer, by miniscule amounts of this extract.



Rick Simpson holding hemp oil. Photo: Christian Laurette

This pioneer for alternative health solutions was in Europe in November, and the Royal Canadian Mounted Police (RCMP) took the opportunity to raid Simpson's home in Canada. As his house, office, and garden were being trampled through by police, Simpson was accepting an International Freedom Fighter award, thousands of miles away.

"While he has been touring in Europe his residence was raided by the RCMP and rumor has it the DEA was involved as well," explains friend Desmond Wynnd.



January 2010 Issue

"The newest issue of "High Times" that came out a week or two ago has a lengthy article on his story and it's felt by many this is what prompted the latest raid. He is now seeking political asylum in Europe."

The 22nd Annual High Times Cannabis Cup was just held in Amsterdam, and there Rick Simpson received the acclaimed honor of "Freedom Fighter of the Year". The special event came on the heels of a European tour Simpson had just completed.

Jack Herer, well-known as "the Hemperor", author of *Emperor Wears No Clothes*, had anxiously awaited joining Simpson for the tour in early fall. Sadly, Herer was afflicted with a heart attack in September passed away, but his assistant Chuck Jacobs was able to attend in his stead. Jack Herer and Rick Simpson are of like minds in that they truly believe hemp can save the world. One person at a time.

For five years, Simpson has been diligently working on the behalf of *saving lives*, challenging the traditional remedies for skin cancer and other cancers, diabetes, as well as many chronic illnesses. He aspires to enlighten the medical community and bring the discussion of curing cancer to a new level. That discussion is widely believed to be more politically motivated than cure goal-oriented.

Though Rick Simpson has helped so many, there are forces that want to stop him, at any cost.

As of December 3rd, Canadian authorities had still not charged Simpson, ten days after the police action. Initially there were discrepancies in available information from the two involved agencies that carried out this police action.

The Royal Canadian Mounted Police first claimed that such an action would have been undertaken by the Amherst Police Department, as Simpson's home falls within their jurisdiction. Amherst PD denied that they incited this action when reached for comment, and deferred inquiry for detail to the RCMP.

Rick Simpson wrote, "If I return home, I will be arrested and put in jail without bail or medicine. I am not afraid of their jails but I cannot go without my medicine, the system has nothing that could help me with my conditions. So for me to return to Canada would be like committing suicide. I would be thrown in jail and denied my medicine and a short time later you would hear in the news that 'Rick Simpson died of natural causes'."

"It seems the goal is to keep me from returning home and they succeeded. But to what end? All hemp magazines on this planet are now telling their readers how to heal themselves with this wonderful medicine. If governments want to live in denial, it will be short-lived. We are gaining tens of thousands of followers every day. You cannot stop the truth."

"For the time being, it seems I will be seeking asylum in Europe."

The Canadian government's lack of tolerance for marijuana has been building the last few years, a reaction, some believe, to America's own drug war. Canadians are feeling the brunt. "They're doing a great job directing hate toward Americans when it's undeserved. I haven't met a bad American yet. In the end, we have to take care of ourselves and each other," Wynnd said.

One theory on limiting a person's ability to share information is to incarcerate them. That's a pretty easy solution. A fellow Canadian, Marc Emery, can vouch for that, out on bail for selling cannabis seeds. He is currently scheduled to be extradited to the United States for a sentence of

five years in US federal prison.

Perpetrators of the incarceration strategy believe that eventually the subject may lose support of their advocates, the costs will mount up, and just getting through the drama of arrest, red tape and humiliation that follows will be enough to distract even the most passionate, motivated activists.

But Rick isn't like "most" activists.

He's been arrested twice in the past, and his medicinal Cannabis plants confiscated. Both times, he was able to reason with the judicial system and continue living freely. Where the maximum penalty has been 12 years imprisonment in one of these instances, the courts instead levied a \$2,000 fine.

Most of us have been duped into completely and blindly accepting that there is no cure for cancer.

—Christian Laurette, producer

"Last time he was arrested, the judge wouldn't send him to jail because the judge believed it would be a crime to lock up Rick Simpson, it's all public record," said Wynnd. "During his last trial he had doctors and patients lining up to testify for him. Even Narcotic officers have sent people to Rick so he could help them."

"Mr. Simpson is in an unusual position, because unlike other people engaged in the drug trade, he was not engaged in trafficking for financial gain," said Judge Carole Beaton. "He was engaged in an altruistic activity and was firm in his belief that he was helping others," she said after Rick Simpson's sentencing for his second offense in healing dying cancer patients with hemp oil.

Rick Simpson didn't start out as a crusader to stamp out cancer. He started out as an average guy, first as a steel worker, then in maintenance at a hospital in the boiler room. In his early twenties, Simpson suffered through the loss of a cousin to cancer. That long, exasperating experience changed him forever. He heard some reports about hemp's healing qualities, and wondered if things would have gone differently for his cousin, had hemp been an option.

For someone who had never even smoked marijuana, this was a very foreign, open-minded idea. The thought provoked some personal research though and later proved very beneficial.

After 25 years working at the hospital, Simpson was in a serious accident causing a temporary nervous-system shutdown, within hours he developed an unbearable ringing in his ears. The doctors tried to find a solution for over a year, and gave up. Not willing to accept his life sentence of daily drugs that altered his memory and other side effects, he asked about medical marijuana, to no avail. So, he began his own research, and experimented with making oil. What he discovered...worked.

To be clear, Rick Simpson's Hemp Oil isn't hemp oil in the truest sense. Hemp is the Cannabis (marijuana) plant, specifically the stalk and leaves raised mainly for industrial use, with extremely low THC. Rick Simpson's oil is made exclusively from the Cannabis flowers, or buds. Not to be confused with hemp seed oil, a very different product, Rick Simpson's hemp oil is a very pure cannabis extract made from high quality buds with a very high THC content.

In 2003, Simpson had three spots on his skin that his doctor believed to be skin cancer. The doctor removed and biopsied one, which then became infected and didn't heal. Almost on a whim,

Simpson applied hemp oil directly to that sore and the other two spots. In only four days, all three cancerous spots were gone. A miracle? Maybe so, but it isn't a lone event.

Once he started sharing his success story with others, people lined up to try the hemp oil. Jack Herer is an avid supporter of Simpson's, always ready to demonstrate his personal success as the oil healed many long-term diabetic lesions on his legs. Herer would be the first to say that Rick Simpson's Hemp Oil is miraculous.

Rick Simpson has never charged a patient for the hemp oil he creates. He not only teaches people how to make the extract and provides it to the ailing folks who request it, but he also uses it for a variety of his own medical issues. He freely lists the [recipe on his site](#).

What will happen next for Rick Simpson remains to be seen. One thing is for sure though, raiding and seizing his home does not make the police look like the good guys. This type of action only propogates further division in society, turning civilians and police away from one another.

"People are dying needlessly when there's a cure we all can grow on our own, or have provided to us," Desmond Wynn said. "This is all a waste of energy, when we could be helping sick people. That's all Rick is trying to do."

***"Why are all these people trying to avoid such a simple truth? If I am in some way wrong in what I have been saying then I invite the system to come and prove it. I would be happy to put on a public demonstration of what this (hemp) oil can do."
—Rick Simpson***

WATCH THE VIDEO REPORT BELOW, FROM RICK SIMPSON'S SITE: PhoenixTears.CA
http://www.youtube.com/watch?v=uomQey0HVGw&feature=player_embedded

WATCH "Run From The Cure", A Documentary: http://www.youtube.com/watch?v=0psJhQhk_GI
(VIEW ALL 7 FILES AT <http://www.youtube.com/chrychek>)

ADDITIONAL INFORMATION:

Excerpt from the High Times interview: <http://hightimes.com/activism/hager/6014>

Rick Simpson's official statement: www.phoenixtears.ca.



Make the medicine!

For those of you who have watched the documentary "Run from the Cure", this should answer any questions about producing your own oil. I recommend that people grow their own hemp either in a small indoor grow system or outdoors. Growing it yourself will eliminate the high cost associated with buying hemp from drug dealers. The cost of hemp can vary greatly from dealer to dealer and so can the quality of the hemp. For anyone new to growing hemp a good book or video on the subject is a necessity. If you go to Cannabis Culture, the good people there should be able to point you in the right direction.

Caution:

Oils that drug dealers sell can have many contaminants and often little or no THC. From my experience, most hemp oil available on the street should be avoided for medicinal use. Make your own oil or have someone you trust produce the oil to assure a very pure, high quality oil is produced.

How much to make and take?

One pound (500g) of bone-dry hemp buds will usually produce about 2 ounces (55 - 60 mL) of high-grade oil. This amount of oil will cure most serious cancers; the average person can ingest this amount in about three months. This oil is very potent so one must begin treatment with small doses. A drop of oil about half the size of a grain of rice, two to four times a day is a good beginning. After four or five days, start increasing your daily dosage very gradually. As time goes on the body builds a tolerance to the oil and more and more can be taken. In cases where people are in a great deal of pain, I recommend that their dosage be quickly increased until it kills the pain. High quality hemp oil will stop pain even when morphine is not effective. The oil can be applied to external injuries for pain relief in minutes.

Will I get high?

Following the dosage previously described, many people can take the full treatment and never get high. In regards to hemp, getting "high" is a joke, even if a person does take too much oil the effect wears off quickly and no harm is done. No one has ever died from the use of hemp medicine.

Will I become addicted?

Hemp oil does not cause your body to crave more. It is non-addictive, harmless and effective for practically any medical condition.

Is this the same as hemp seed oil?

No! This is hemp oil, made from the bud and small leaves of the hemp plant. It is the essential oil of the hemp plant. Health food store sells oil made from hemp seed that is often mislabeled as hemp oil. Although seed oil is very beneficial, it does not contain enough THC to have any effect on cancer and other serious illnesses.

Are hemp and marijuana the same?

The word marijuana is one of over four hundred slang terms used worldwide to describe the cannabis and/or hemp plant.

Are all hemp plants the same?

When buying or growing hemp, procure a strain that has the highest possible THC content. To energize someone suffering from depression, I recommend a good Sativa strain. For most other medical conditions, I strongly suggest that Indica strains be used. Indicas relax a person and provide them with more rest and sleep.

How do I use it?

High quality hemp oil can be vapourized, ingested or used topically. Add the oil to creams and salves for external use.

Where can I get information about making the oil?

For someone new to making the oil I suggest that you go to "Run From The Cure". There you can watch our documentary in seven segments. Segment #4 shows how the oil can be produced at home or one can go to Phoenix Tears Movie and download the full documentary. You will need a high-speed internet connection and there is no charge. The process in the video could only be described as crude at best, but the oil that is produced will cure cancer. In reality, this medicine should be produced in a controlled environment, using distilling equipment, etc. to reclaim the solvent and to purify the oil. Most people do not understand distilling and do not have access to the required equipment. This is the reason such a simple method is described in the documentary, so if need be just about anyone can produce the oil. As in the video, again we stress that this process, if not done properly can be dangerous and we bear no responsibility if this educational information is misused.

My process:

Starting material:

I generally work with a pound or more of good grade hemp starting material. You can use just one ounce. An ounce will usually produce 3 or 4 grams of oil. The amount of oil produced per ounce of hemp will vary from strain to strain, but it all has that wonderful healing power.

- 1 - Place the completely dry starting material in a plastic bucket.
- 2 - Dampen the material with the solvent you are using. Many solvents can be used. I like to use pure naphtha but it costs \$500 for a 45-gallon drum. You can use 99% isopropyl alcohol, which you can find in your local drug stores. Alcohol absorbs more chlorophyll from the plant material than naphtha does. This gives oils made with alcohol a darker colour but does not diminish the potency of the oil to any noticeable degree. Ether, naphtha or butane and many other solvents can produce oils that are amber and transparent. Granted these clear oils do look better but dark oil can be just as potent. If the process is done properly, little or no solvent residue is left in the oil. I have been consuming oils produced using different solvents for eight years with no harmful effects. You will require about two gallons of solvent to strip the THC off one pound of dry starting material. 500 milliliters of solvent should be more than enough to strip the THC from one ounce of hemp starting material.
- 3 - Crush the plant material using a stick of clean untreated (chemical free) wood or some such device. Even though the starting material has been dampened with the solvent, you will find that the material can be readily crushed.
- 4 - Add solvent until the starting material is completely covered.
Use the stick to work the plant material. As you are doing this, the THC dissolves off the plant material into the solvent.
- 5 - Continue this process for about 3 minutes.
- 6 - Pour the solvent-oil mix off the plant material into another bucket. You have just stripped the plant material of about 80% of its THC.
- 7 - Second wash - again add solvent to the plant material and work it for another 3 minutes to get the other 20%.
- 8 - Pour this solvent-oil mix into the bucket containing the first mix that was poured off previously.
- 9 - Discard the twice-washed plant material.
- 10- Pour the solvent-oil mix through a coffee filter into a clean container.
- 11- Boil the solvent off. I have found that a rice cooker will do this boil off very nicely. The one I have has two heat settings - high and low - and will hold over a half gallon (2.5 liters) of solvent-oil mix.
- 12- Add solvent-oil mix to the rice cooker until it is about $\frac{3}{4}$ full.

Make sure you are in a very well ventilated area and set up a fan to carry the solvent fumes away. The fumes are very flammable. Be sure to stay away from red-hot elements, sparks, cigarettes etc. that could ignite the fumes.

- 13- Plug the rice cooker in and set it on high heat.

- 14- Continue adding solvent-oil mix as the level in the rice cooker decreases until it is all in the cooker.
- 15- Add a few drops of water to the solvent-oil mix as the level comes down for the last time. The amount of water added depends on how much starting material you had in the beginning. If I am producing oil from a pound of good bud, I usually add about ten drops of water.
- 16- When there is about one inch of solvent-oil-water mix left in the cooker, put on your oven mitts, pick the unit up and gently swirl the contents
- 17- Continue swirling until the solvent has been evaporated off. The few drops of water help release the solvent residue and protect the oil somewhat from too much heat. When the solvent has been boiled off, the cooker that I use automatically goes to low heat. This avoids any danger of overheating the oil. At no time should the temperature of the oil go over 290F degrees (140 C).
- 18- Put on your oven mitts and remove the pot containing the oil from the rice cooker.
- 19- Gently pour the oil into a small stainless steel container.
- 20- Place this container in a dehydrator or put in on a gentle heating device such as a coffee warmer. It may take a few hours but the water and volatile turpines will be evaporated from the oil. When there is no longer any activity on the surface of the oil the medicine is ready for use.
- 21- Pour the hot oil into a bottle; or as in the video suck it up into a plastic syringe. Putting the oil in a plastic syringe makes it very easy to dispense the medicine.

When the oil cools off it has the consistency of thick grease. Some strains will produce very thick oil and you may have trouble squeezing it out of the syringe. If this happens, place the syringe in warm water a few minutes prior to use.

To anyone starting to use hemp oil as a medication, here are some simple facts.

Hemp oil will lower blood pressure and if you are on blood pressure medication, you may find that this medication is no longer needed. The same is true for diabetics. I have seen hemp oil control blood sugar to the extent that insulin was no longer needed.

I am not a doctor and I do not have the right to tell people what they should do. Personally, I would not consider taking any cancer treatments currently in use by our medical system, I do not recommend that hemp oil be taken along with chemotherapy. What would be the sense of making your own cure and then allowing the medical system to give you massive doses of poison?

From my experience with hemp medicine, I have found that most pharmaceutical medications are no longer needed once a person starts using hemp oil. Hemp oil seems to mix well with most natural medications but I have had a few reports from people trying to take hemp oil and pharmaceuticals who experienced stomach pain etc. All problems ceased when they stopped taking the prescription drugs.

To anyone who is going to act on this information to help a loved one, I welcome you to the world of real medicine. Again, I caution you to be very careful when boiling the solvent off. The fumes are very flammable. Be sure to stay away from red-hot elements, sparks, cigarettes etc. that could ignite the fumes.

I wish you the best luck and health.

Warmest regards,

Rick Simpson.

<http://www.phoenixtears.ca/make.php>

Hemp Oil Dosage Information

It takes the average person about 90 days to ingest the full 60 gram treatment. I suggest that people start with 3 doses per day about half the size of a grain of dry rice. A dose such as this would equal about 1/4 of a drop. After four days at this dosage, increase your doses every four days until you are at the point where you are ingesting about 1 gram in 24 hours, so each dose should equal 1/3 of a gram.

It takes the average person about 5 weeks to get to the point where they can ingest a gram per day. Once they reach this dosage they can continue at this rate until the cancer disappears. A gram is just slightly less than 1ml.

By using this method it allows the body to build up its tolerance slowly, in fact, I have many reports from people who took the oil treatment and never got 'high'. We all have different tolerances for any medication. Your size and body weight have little to do with your tolerance for hemp oil.

Be aware when commencing treatment with hemp oil that it will lower your blood pressure, so if you are currently taking blood pressure medication, it is very likely that you will no longer need it.

When people are taking the oil, I like to see them stay within their comfort zone, but the truth is, the faster you take the oil the better the chance of surviving. At the end of their treatment most people continue taking the oil but at a much reduced rate. 6 to 12 grams a year would be a good maintenance dose. I do not like to see people overdosing on the oil, but an overdose does no harm. The main side effect of this medication is sleep and rest which plays an important role in the healing process. Usually, within an hour or so of taking a dose, the oil is telling you to lay down and relax. Don't fight the sleepy feeling, just lay down and go with it. Usually within a month, the daytime tiredness associated with this treatment fades away but the patient continues to sleep very well at night. The only time I would recommend that people start out with larger doses would be to get off addictive and dangerous pain medications. When people who are using such medications begin the oil treatment, they usually cut their pain medications in half. The object is to take enough oil to take care of the pain and to help the patient get off these dangerous pharmaceutical drugs. Taking the oil makes it much easier for the patient to get off these addictive chemicals.

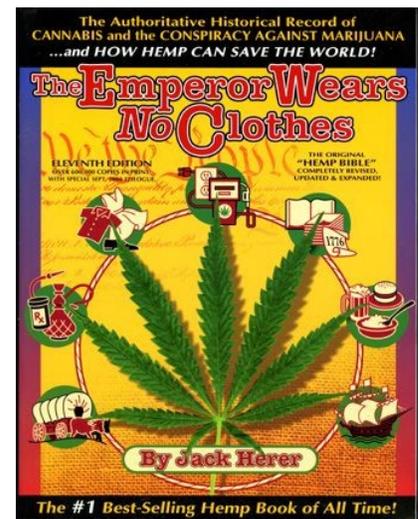
I simply tell people the oil will do one of two things; it will either cure your cancer or in cases where it is too late to affect a cure, the oil will ease their way out and they can at least die with dignity. Hemp oil has a very high success rate in the treatment of cancer, unfortunately many people who come to me have been badly damaged by the medical system with their chemo and radiation etc. The damage such treatments cause have a lasting effect and people who have suffered the effects of such treatments are the hardest to cure. It should also be mentioned that the oil rejuvenates vital organs like the pancreas. Many diabetics who have taken the oil find that after about six weeks on the oil that they no longer require insulin since their pancreas is again doing its job.

Properly made hemp medicine is the greatest healer on this planet bar none. Once you experience what this medication can do you will understand why history and I call hemp medicine a cure all.

<http://www.phoenixtears.ca/index.php>

Download a free e-book of The Emperor Wears No Clothes

www.scribd.com/doc/14448996/The-Emperor-Wears-No-Clothes-Jack-Herer



HEMP FACTS

- 1) Hemp is among the oldest industries on the planet, going back more than 10,000 years to the beginnings of pottery. The Columbia History of the World states that the oldest relic of human industry is a bit of hemp fabric dating back to approximately 8,000 BC.
- 2) Presidents Washington and Jefferson both grew hemp. Americans were legally bound to grow hemp during the Colonial Era and Early Republic. The federal government subsidized hemp during the Second World War and US farmers grew about a million acres of hemp as part of that program.
- 3) Hemp Seed is nutritious and contains more essential fatty acids than any other source, is second only to soybeans in complete protein (but is more digestible by humans), is high in B-vitamins, and is a good source of dietary fiber. Hemp seed is not psychoactive and cannot be used as a drug. See <http://TestPledge.com>
- 4) The bark of the hemp stalk contains bast fibers which are among the Earth's longest natural soft fibers and are also rich in cellulose; the cellulose and hemicelluloses in its inner woody core are called hurds. Hemp stalk is not psychoactive. Hemp fiber is longer, stronger, more absorbent and more insulative than cotton fiber.
- 5) According to the Department of Energy, hemp as a biomass fuel producer requires the least specialized growing and processing procedures of all hemp products. The hydrocarbons in hemp can be processed into a wide range of biomass energy sources, from fuel pellets to liquid fuels and gas. Development of biofuels could significantly reduce our consumption of fossil fuels and nuclear power.
- 6) Hemp grows well without herbicides, fungicides, or pesticides. Almost half of the agricultural chemicals used on U.S. crops are applied to cotton.
- 7) Hemp produces more pulp per acre than timber on a sustainable basis, and can be used for every quality of paper. Hemp paper manufacturing can reduce waste-water contamination. Hemp's low lignin content reduces the need for acids used in pulping, and its creamy color lends itself to environmentally friendly bleaching instead of harsh chlorine compounds. Less bleaching results in less dioxin and fewer chemical by-products.
- 8) Hemp fiber paper resists decomposition, and does not yellow with age when an acid-free process is used. Hemp paper more than 1,500 years old has been found. Hemp paper can also be recycled more times than wood based paper.
- 9) Hemp fiberboard produced by Washington State University was found to be twice as strong as wood-based fiber-board .
- 10) Eco-friendly hemp can replace most toxic petro-chemical products. Research is being done to use hemp in manufacturing biodegradable plastic products: plant-based cellophane, recycled plastic mixed with hemp for injection-molded products, and resins made from the oil, to name just a very few examples.

Today's Hemp Industry

AUSTRALIA:

Tasmania research trials began in 1995. Victoria commercial production since 1998. New South Wales has research. In 2002 Queensland began production.

AUSTRIA

has a hemp industry including production of hempseed oil, medicinals and Hanf magazine.

CANADA

started to license research crops in 1994 on an experimental basis. In addition to crops for fibre, one seed crop was experimentally licensed in 1995. Many acres were planted in 1997. Licenses for commercial agriculture saw thousands of acres planted in 1998. 30,000 acres planted in 1999, including organic acreage. In 2000, due to speculative investing, 12,250 acres were sown. In 2001 ninety-two farmers grew 3,250 acres.

CHILE

grows hemp mostly for seed oil production.

CHINA

is the largest exporter of hemp paper and textiles. The fabrics are of excellent quality. (ma)

DENMARK

planted its first modern hemp trials in 1997. Committed to utilizing organic methods.

FINLAND

has had a resurgence of hemp (hampu) beginning in 1995 with several small test plots. A seed variety for northern climates has been developed: FIN-314.

FRANCE

harvested 10,000 tons in 1994. France is the main source of low-thc producing hempseed.

GERMANY

only banned hemp in 1982, but research began in 1992 and many technologies and products are being developed. Clothes and paper are being made from imported raw materials. Germany lifted the ban on growing hemp November, 1995. Mercedes and BMW use hemp fiber for composites. (hanf)

GREAT BRITAIN

lifted hemp prohibition in 1993. Animal bedding, paper and textiles have been developed. A government grant was given to develop new markets for natural fibers. 4,000 acres were grown in 1994. Subsidies of \$230 Eng. pounds per acre are given by the govt. for growing.

HUNGARY

is rebuilding their hemp industry, and is one of the biggest exporters of hemp cordage, rugs and hemp fabric to the U.S. They also export hemp seed and hemp paper. Fiberboard is also made.

INDIA

has large stands of naturalized Cannabis and uses it for cordage, textiles, and seed oil.

JAPAN

has a religious tradition which requires that the Emperor wear hemp garments, so there is a small plot maintained for the imperial family only. They continue to import for cloth and artistic applications.

NETHERLANDS

is conducting a four year study to evaluate and test hemp for paper, and is developing processing equipment. Seed breeders are developing new strains of low-thc varieties.

NEW ZEALAND

started hemp trials in 2001. Various cultivars are being planted in the North and South.

POLAND

currently grows hemp for fabric and cordage and manufactures hemp particle board. They have demonstrated the benefits of using hemp to cleanse soils contaminated by heavy metals.

ROMANIA

is the largest commercial producer of hemp in Europe. Total acreage in 1993 was 40,000 acres. Some of it is exported to Hungary for processing. They also export to Western Europe and the United States. One company is moving toward organic production.

RUSSIA

maintains the largest hemp germ plasm collection in the world at the N.I. Vavilov Scientific Research Institute of Plant Industry (VIR) in Saint Petersburg. They are in need of funds.

SLOVENIA

grows hemp and manufactures currency paper.

SPAIN

grows and exports hemp pulp for paper and produces rope and textiles. (cañamo)

SWITZERLAND

is a producer of hemp and hosts one of the largest hemp events: Cannatrade.

EGYPT, KOREA, PORTUGAL, THAILAND

, and the

UKRAINE

also produce hemp.

USA

- The United States granted the first hemp permit in over 40 years to Hawaii for an experimental quarter acre plot in 1999. The license has been renewed since. Importers and manufacturers have thrived using imported raw materials. Twenty-two states in the United States have introduced legislation. VT, HI, ND, MT, MN, IL, VA, NM, CA, AR, KY, MD, WV have legislated for support, research, or cultivation with bills or resolutions. The National Conference of State Legislators has endorsed industrial hemp for years

Hemp Industries Association

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Email: info@thehia.org & <http://thehia.org> & <http://hempstores.com> & <http://testpledge.com>

Join our internet protest!



We at Phoenix Tears are asking you to join with us in this worldwide internet protest. Our aim is to bring hemp, man's oldest known and safest medication, back into widespread medicinal use.

Our research, backed by hundreds of other studies done worldwide, has proven properly made hemp medicine provides relief or cures many diseases, even cancer. Throughout thousands of years of medicinal use hemp has been known as a panacea, which means cure-all and not without good reason. We have provided hemp medicine to hundreds of people with various medical conditions and the results speak for themselves.

Governments and corporations have used the word "marijuana" to demonize hemp to the public. Marijuana is one of over 400 slang terms used worldwide to describe the cannabis hemp plant. The public has been told that hemp is a dangerous and addictive drug while scientific studies have proven that this is not true. The essential oil made from the bud of the female hemp plant is the most therapeutically active substance known to man. Millions of people enjoy smoking hemp, but this is the least effective way to use the plant medicinally. The real medical miracles occur when the oil is ingested or used topically on skin infections or diseases - then watch what happens! Hemp is real medicine straight from Mother Nature, not some concoction of chemicals and poisons produced in a pill factory somewhere.

Our aim is to produce hemp medicine on a large scale and make it available to the public on a donation basis. Whether you have the money or not, as long as you have the medical condition you get the medicine, no one has the right to put a price tag on your health.

Our history is littered with corruption, ignorance, wars, diseases and death. How many wars must be fought before the human race realizes that war is senseless and is humanity at its worst. Restricting the use of the most medicinal plant on earth is also mankind at our self-destructive worst. Why are so many people willing to believe a pack of lies about hemp without even looking into the truth of the matter for themselves? One would think everyone should be concerned when in the end for most of us; our very lives will depend on this medicine being available.

Big money and the governments they control, for many decades have told us that hemp is dangerous, we say prove it, and forget the double talk. We are more than willing to produce our evidence to the public. The people who have been restricting hemp's use should do the same.

In Canada, people with serious medical conditions are put through a bureaucratic hell called the Marijuana Access Program. Approximately 2000 people in Canada have been given a license to possess hemp. Imagine, 2000 out of a population of over thirty million. People with this license can then purchase hemp from the government at a 1500% markup. The government pays \$328.00 for a kilogram of hemp and then they sell it to licensees for about \$6000.00 kg. Isn't it gratifying to know the government has such compassion for poor and suffering medicinal users.

The Marijuana Access Program was put in place so the government could pretend to be helping people, while they make huge profits from medicinal users. Anyone can buy a kilogram of much higher quality hemp from growers for less than the government charges, which leaves the question, who are the drug dealers? Even people who have been granted a license to possess hemp are not allowed to collect the resin or produce the essential oils. The resin and the oils produced from it are the real medicine. You can smoke hemp joints until the cows come home but it will not cure your cancer and the government knows it.

Opinion polls tell us that over ninety percent (90%) of people in Canada want hemp legalized for medicinal use. Why is our government not doing what their citizens want? Government and all they control must see the error of their ways. Practically all of our Canadian institutions are being controlled by government. Our medical system, legal and policing systems, the Royal Canadian Legion, even the "free press" and other news media are all controlled by government corruption and there are many others. We are not advocating retribution or violence against anyone, what we are demanding is change. The real truth about hemp and its medicinal value must be told to end this insanity of hemp's medicinal restriction.

If the human race and this planet ever needed hemp, it is now. The earth has been poisoned by rampant capitalism

and the immune systems of humans and other species have been compromised. People today are dying of diseases that were practically unknown forty years ago. Even the food we eat in many cases is not fit for human consumption.

We are in the middle of a cancer epidemic while the "powers that be" restrict the use of a natural drug that can put an end to much of this needless suffering and death. When hemp's restriction is lifted, it will provide tens of thousands of jobs and it will put many farmers back on the land where they belong. Hemp can also solve all our energy requirements while it detoxifies the land it is planted in.

In reality, there is no downside for the human race or this planet if hemp is grown everywhere. Just harvesting seed from the hemp plant and providing it to the people in need will help put an end to starvation on this earth. No more of those horrible images of children starving to death. Growing hemp on a grand scale would also take the criminal element out of this wonder plant. When hemp is grown like corn what does it cost to produce it? What is a pound of corn worth? That should answer the question.

The corruption that is the law put in place against hemp is also what fuels the criminal element. If this law is changed hemp becomes of very little value, hence it is no longer of any criminal interest. When last I checked, somewhere to the tune of 80% of drug related deaths from the use of street drugs are attributed to pharmaceutical medications. How many people do you know of that have died from using hemp?

Within our medical system there are doctors that will prescribe hemp, but they are few and far between and I have yet to find one. If your doctor is like the ones I have come in contact with they will say things like; hemp is still under study, when indeed they know a lot more than they are telling you. Doctors who refuse to prescribe hemp are not healers; they are nothing but drug dealers for the pharmaceutical firms.

Take a look at all these organizations like the Cancer Society etc. Now ask yourself where all the money they have collected has gone? Do you really believe any of these organizations want to cure any thing? The bottom line is, if they did, they would be out of work! If indeed the public would like to donate money to a real cause, your support will be appreciated by everyone. Please send donations to Phoenix Tears, c/o Rick Simpson, 344 Little Forks Rd., G.D. Springhill, NS B0M 1X0. We already have the cure, all we need is the right to produce it.

I wish I could say otherwise but our legal system is no better than our medical system. Do you think that lawyers don't know that the law against hemp is based on corruption? Of course they do, they just don't want to give up the income they are making supposedly defending people facing hemp charges. It seems that most professionals are willing to sell their souls to go along with the system and thicken their wallets.

This is our watch. It is time to bring this dark chapter in man's history to an end. Is the human race to stand by and let big corporations kill our loved ones and ruin the planet we live on? As I have said many times, the people are the real power in any country, all we have to do is stand as one and this nightmare is brought to an end. The power that created the human race did not intend for us to destroy ourselves through ignorance and corruption. If something is not done right now there is no future for mankind, I urge everyone out there to educate themselves about hemp. Help bring hemp's restriction to an end. Stand up and be counted. <http://www.phoenixtears.ca/protest.php>

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PRESS RELEASE

SACRAMENTO, CA Governor Arnold Schwarzenegger vetoed AB 684, The California Industrial Hemp Farming Act, yesterday evening, rejecting the will of the vast majority of Californians who supported the legislation. The landmark, bi-partisan legislation would have followed North Dakota in establishing guidelines for the farming of industrial hemp which is used in a wide variety of everyday consumer products, including food, body care, clothing, paper, and auto parts. The new law would have established a five-year pilot project in four counties to allow farmers to legally supply numerous California manufacturers that currently must import hemp raw materials (including seed, oil and fiber) from Canada and elsewhere. The pilot would have given the hemp industry an opportunity to assess the crop's impact on the state economy and allowed law enforcement to measure any negative effects hemp farming might have had on their drug eradication efforts.

"Governor Schwarzenegger's veto message ignores the fact that California regularly enacts laws that face federal scrutiny and even litigation," says Patrick Goggin, California Council for Vote Hemp, the nation's leading industrial hemp farming advocacy group. "The vetoed bill is no different than numerous other bills the Governor has signed that asserted the State's right to regulate where the U.S. Congress has not."

AB 684 would have clarified that the cultivation of industrial hemp is legal only on the condition it contains no more than three tenths of one percent (0.3%) tetrahydrocannabinol (THC). The legislation was jointly authored by Democratic Assemblyman Mark Leno and Republican Assemblyman Chuck DeVore.

"The Governor's environmental credentials should take a hit because of this veto," comments David Bronner, President of both the Hemp Industries Association (HIA) and Dr. Bronner's Magic Soaps. "Industrial hemp is about sustainable agriculture that saves our forests, reduces use of agricultural chemicals, and cuts carbon emissions by replacing petroleum based products like fiberglass in insulation and natural fiber composites. Governor Schwarzenegger has again embraced an irrational

approach to one of the most environmentally beneficial crops known to man," said Bronner.

California businesses spend millions of dollars each year importing hemp from Canada, China and Europe. Demand for hemp products has been growing rapidly in recent years. The North American hemp market now exceeds an estimated \$300 million in annual retail sales. From natural soaps to healthy foods, there are a wide variety of "Made in California" hemp producers that could benefit from an in-state source of hemp seed, fiber and oil.

John Roulac founder of California hemp food manufacturer Nutiva is not discouraged by the veto. "The funny thing is we are not going away. At a time when resources are running low and polar caps are melting-the general public is moving towards health and sustainable solutions. Regardless of what any politician says or does- we will just build a billion dollar hemp foods marketplace. Every main stream grocery and natural food stores isle will have stacks of hemp food in the coming decade. It is hard to even think of a food category that hemp will not be player in."

Vote Hemp's goal was to release California farmers from the over-reaching prohibition on industrial hemp cultivation and reintroduce the crop to the state. AB 684 would have allowed California to follow North Dakota's lead and assert its right to regulate industrial hemp under the U.S. Constitution, the federal law, and recent U.S. Circuit Court decisions.

AB 684 would have revitalized commercial industrial hemp farming in California, which occurred in the state until shortly after World War II. Support for state action on industrial hemp farming has been growing among U.S. manufacturers whose appetite for hemp fiber, seed and oil is fueling the increased demand. For example, in the automotive industry, industrial hemp is used in the natural fiber composites that have rapidly replaced fiberglass as the material of choice for vehicle interiors. At least 3 million cars in North America already have hemp-based components in them.

Hemp is a versatile crop, and its sales are growing as an organic food and body care ingredient. Imports of hemp seed from Canada grew 300% between 2006 and 2007. Today, more than thirty industrialized nations grow industrial hemp and many export it to the U.S. Incredibly, hemp is the only crop that is legal for Americans to import yet illegal to grow.

Some notable organizations that supported the industrial hemp bill include the Sierra Club, Organic Consumers Association, California Certified Organic Farmers, and Rainforest Action Network.

The Governor's veto message, along with additional background on the bill, can be found online at: <http://www.votehemp.com/state/california.html>

CONTACT: Patrick Goggin 415-312-0084

More information about hemp legislation and the crop's many uses can be found at <http://www.votehemp.com/> . BETA SP and DVD Video News Releases featuring footage of hemp farming in other countries are available upon request by contacting Adam Eiding at 202-744-2671.

<http://www.enn.com/agriculture/article/23874>

Governor's Veto Message:

To the Members of the California State Assembly:

I am returning Assembly Bill 684 without my signature.

As I indicated last year, I appreciate and applaud the Legislature's interest in actually expanding California's economy; however, I am concerned about the impact of the particular type of expansion that is being proposed. I recognize and am proud of that fact that California is a national and world leader in the production of high-quality agricultural commodities. Our state has a rich agricultural environment and we must strive to protect and promote farming, ranching and agri-business in California, while preserving natural resources and protecting consumers.

Given these facts, I would like to support the expansion of a new agricultural commodity in this State. Unfortunately, I am very concerned that this bill would give legitimate growers a false sense of security and a belief that production of "industrial hemp" is somehow a legal activity under federal law.

Under federal law, all cannabis plants, regardless of variety or THC content, are simply considered to be "marijuana", which is a federally regulated controlled substance. Any person in the United States that wishes to grow cannabis plants for any purpose, including industrial purposes, must first obtain permission and register with the U.S. Drug Enforcement Administration (DEA). Failure to do so would be a violation of federal law and could subject an individual to criminal penalties.

In addition, California law enforcement has expressed concerns that implementation of this measure could place a drain on their resources and cause significant problems with drug enforcement activities. This is troubling given the needs in this state for the eradication and prevention of drug production.

For these reasons, I am unable to sign this bill.

Sincerely,
Arnold Schwarzenegger

AlterNet / By Bruce Mirken

The Marijuana Cancer Cure Cult

It's not as far-fetched as it sounds, but some enthusiasts may be going too far.

January 26, 2010



In his 1971 State of the Union speech, President Richard Nixon declared war on cancer, prompting passage of the National Cancer Act, aimed at making the "conquest of cancer a national crusade." Just four years later, scientists from the National Cancer Institute [published a study](#) demonstrating that a group of compounds taken from a common, widely cultivated plant shrank lung tumors that had been implanted in mice, extending their survival.

In a world that made sense, this plant and the anticancer drugs it produced would have been rushed into further testing, and we'd have known in a few years whether they had potential as treatments for human cancers. Instead, research proceeded at a glacial pace, with almost no further progress till the 1990s. Since then, vast quantities of lab and animal data have confirmed those early findings, but studies of these plant compounds in actual human beings with cancer remain nearly nonexistent.

What got in the way was Nixon's other war, the "war on drugs." The plant in question was *cannabis sativa* -- marijuana -- public enemy number one in that other war, and discovering that marijuana had beneficial properties was the last thing the U.S. government wanted to do.

Dr. Manuel Guzman of Complutense University in Madrid, lead author of the only human study yet published of a cannabinoid as cancer treatment, puts it slightly more diplomatically. The lack of immediate followup to those early reports "remains a mystery to me," he says. Guzman cites a number of obstacles to human trials, including the fact that cannabinoids are "still seen by many doctors and regulatory agencies as drugs of abuse," as well as "lots of paperwork" and a lack of commercial interest in natural compounds that can't be patented.

Complicating things further, the relative vacuum created by the lack of human studies and the hostility of the U.S. government to the whole question of marijuana's beneficial effects has left the field wide open for zealots who promote cannabis as a "cure" for cancer as if it were already a proven fact rather than a possibility in desperate need of serious study.

A Protective Effect?

Instead of researching cannabinoids as anticancer drugs, federal officials have continued to falsely imply that marijuana causes lung cancer. For example, a 2002 brochure for parents, "[Talk to Your Child About Marijuana](#)," still available on the Office of National Drug Control Policy Web site, advises, "Smoking marijuana is as least as bad as smoking cigarettes."

In fact, the largest, most well-controlled studies have consistently failed to find an increased risk of lung cancer or other typically tobacco-related cancers among marijuana smokers. These include a 65,000-patient 1997 study conducted at [Kaiser Permanente in Oakland, California](#) and a 2006 [case-control study](#) (in which patients with cancer were matched with similar patients without cancer to compare risk factors) from the UCLA lab of Dr. Donald Tashkin, one of the world's leading experts on the pulmonary effects of drugs.

In the UCLA study, there was a consistent trend -- albeit short of statistical significance -- toward lower cancer risk among even the heaviest marijuana smokers. This was a surprise to some, given that marijuana smoke contains many of the same carcinogenic compounds as tobacco smoke. The researchers wrote:

Although purely speculative, it is possible that such inverse associations may reflect a protective effect of marijuana. There is recent evidence from cell culture systems and animal models that 9-tetrahydrocannabinol, the principal psychoactive ingredient in marijuana, and other cannabinoids may inhibit the growth of some tumors by modulating key signaling pathways leading to growth arrest and cell death, as well as by inhibiting tumor angiogenesis. These antitumoral associations have been observed for several types of malignancies including brain, prostate, thyroid, lung, and breast.

In an October 2003 review in the journal [Nature Reviews: Cancer](#), Guzman detailed the extensive body of test-tube and animal research showing that cannabinoids inhibit tumors of the lung, uterus, skin, breast, prostate and brain (including gliomas, the type of tumor that killed Sen. Edward Kennedy). He also noted: "Cannabinoids have favorable drug-safety profiles and do not produce the generalized toxic effects of conventional chemotherapies. Cannabinoids are selective antitumor compounds, as they can kill tumor cells without affecting their non-transformed counterparts."

Such selectivity is exactly what you want in an anticancer drug. The reason chemotherapy can be so awful is that most chemo drugs aren't selective enough; they kill cancer cells, but are also toxic to healthy cells, leading to vomiting, hair loss and other miseries.

The 'Cure'?

Nearly all of the evidence about cannabinoids as anticancer drugs comes from lab studies using cell cultures or animals with experimentally implanted tumors. The annals of medical research are littered with drugs that looked promising in the lab but didn't work in people. Still, that doesn't stop some enthusiasts from touting cannabis as a cure for cancer, sometimes making even open-minded scientists and medical marijuana advocates nervous.

When I worked at the Marijuana Policy Project, we received several impassioned emails imploring us to tell Sen. Kennedy that cannabis could cure his brain tumor. Others touted Canadian Rick Simpson's "Healing Hemp Oil" Web site, [Phoenix Tears](#).

In a series of videos, letters and other materials on the site, Simpson -- who has had repeated run-ins with law enforcement over his cannabis-related activities and was, according to a Dec. 14 posting, staying in Europe indefinitely to avoid arrest -- promotes what he calls "hemp oil" as a "simple herbal cure for cancer. I have used these extracts to cure three areas of skin cancer on my own body, also, I have cured cancers for others." Simpson also touts hemp oil for pain and a variety of other conditions.

The site includes video and written instructions for making the preparation. The procedure involves using a solvent such as naphtha or isopropyl alcohol to extract the THC from marijuana, then boiling off the solvent using a rice cooker to leave a thick oil with a high THC concentration.

Simpson warns readers away from conventional cancer treatments: "Hemp oil has a very high success rate in the treatment of cancer, unfortunately many people who come to me have been badly damaged by the medical system with their chemo and radiation etc. The damage such treatments cause have a lasting effect and people who have suffered the effects of such treatments are the hardest to cure."

He offers numerous stories and testimonials describing seemingly hopeless cancers cured by hemp oil, but no controlled, scientific experiments.

And critics find plenty to worry about. First, they note, despite warnings and disclaimers on the site, the procedure for making the medicine is risky. Mitch Earleywine, author of *Understanding Marijuana* and a professor of psychology at the State University of New York at Albany, calls the do-it-yourself procedure "outrageously dangerous. Even if you don't light yourself on fire, you may end up with leftover solvent that would slowly poison the healthiest of us."

There's a reason scientists don't base conclusions on anecdotes, Earleywine explains. "Cancer remits spontaneously sometimes, which is a good thing. Unfortunately, it leads to superstitious conditioning so people think that whatever they did last must be the source of the cure. Especially with some cancers, where a great many people die, all the spontaneous recoveries associated with hemp oil get remembered while all those that don't either get forgotten or attributed to the horrors of the disease."

Earleywine stresses that he is not dismissing the possibility that some form of cannabis might be an effective cancer treatment. "THC killing tumors is actually true," he says, "but we're not at the human stage [of research]."

Simpson is dismissive of critics who cite the lack of human studies. "How are you going to do controlled studies when it is illegal in Canada to do so?" he said in an emailed response to questions.

In fact, researcher Mark Ware of McGill University in Montreal has done clinical trials of medical cannabis in Canada, including a study comparing several different cannabis preparations in [use by chronic pain patients](#).

Simpson calls the idea of spontaneous cancer remissions "nonsense." As for possible risks of his preparation, he argues, "It is irresponsible to give people liver toxic chemicals, chemotherapy and radiation, so if they are talking about irresponsible why do not look at their own medical system? It is not irresponsible to save people's lives with a harmless natural, non-addictive medicine from nature. If you watch our documentary, you will see that I use a simple water purification process to get rid of solvent residue. I have been ingesting oil for over eight years and I have supplied this oil to thousands of people who also have experienced no problems with solvent residue."

While cautious about reports that are "solely anecdotal," Paul Armentano, deputy director and resident science wonk at the National Organization for the Reform of Marijuana Laws, lays blame for the lack of proper data at the foot of prohibition. "It is a shame that lone individuals must try and engage in the work that the medical establishment should be undertaking, yet have turned a blind eye to," he says. "Unfortunately, what we have is speculation rather than hard science, and we only have the politicization of cannabis to blame."

The Long and Winding Research Road

The one human study of a cannabinoid cancer treatment published thus far was conducted by Dr. Guzman and colleagues and published online in June 2006 by the [British Journal of Cancer](#). The scientists infused a THC solution directly into the tumors of nine patients with glioblastoma multiforme, a deadly form of brain cancer, for whom standard treatments had failed. This small pilot study wasn't aimed at proving that THC worked, simply that it was safe to administer to these otherwise doomed patients .

It proved entirely safe, with no negative effects attributed to the THC and no "overt psychoactive effects." And while there were no miracle cures, there were glimmers of possible efficacy. In one patient with an "extremely aggressive" cancer, tumor growth was curbed for nine weeks. In another, symptoms improved, although tumor growth was not stopped. And in some cases, lab tests with cells taken from tumor biopsies showed that THC decreased the number of viable cancer cells.

Guzman and colleagues noted that THC may not be the best cannabinoid to use as a cancer treatment, as others have been shown more potent in lab tests. And while the direct infusion technique delivered a high THC concentration to specific locations, it may not have reached all parts of these large tumors.

Still, the results were positive enough that the researchers urged further tests, including studies of cannabinoids in

combination with other cancer drugs. Guzman is hoping to do more studies, but notes that with all the bureaucratic, procedural and financial hurdles, "The way ahead is long and winding."

But if more human studies aren't happening yet, lab work continues to produce intriguing results. Just this month, the journal *Molecular Cancer Therapeutics* [published a new study](#) providing the first evidence that combination cannabinoid therapy is more potent than using THC or other cannabinoids as single agents.

Sean McAllister and colleagues from the California Pacific Medical Center Research Institute in San Francisco tested THC, cannabidiol (CBD) and both drugs combined on human glioblastoma cell lines. In two of the three cell lines tested, the THC/CBD combination proved the most potent -- more so than would be expected by just adding the anticancer effects of the two drugs together, suggesting a synergistic action.

"Combinations, compared to individual drug treatments with specific cannabinoid-based compounds, may represent an improvement for the treatment of patients with glioblastoma and perhaps additional cancers," McAllister says. "It is also possible that other constituents of *Cannabis sativa* which are not structurally related to cannabinoids could improve antitumor activity when combined."

That leads to an obvious question: Why not use the whole plant -- whether smoked, vaporized, or in some sort of extract like Simpson's? "In regard to brain cancer, it is highly unlikely that effective concentrations of either Δ^9 -THC or CBD could be reached by smoking cannabis," McAllister says. "In regard to additional cancers, I feel defined formulations and dosing will be needed in order to effectively treat patients."

McAllister says his team is moving toward "clinical trials in both breast and brain cancer, but it is a slow process." The next step, he says, will be to try to replicate his test-tube results in animals. "No agency in the U.S. would allow me to move forward to clinical trials without some form of proof of concept data in a relevant preclinical in vivo model."

That may be an accurate assessment, but Armentano thinks it's too cautious "given the long established safety of cannabinoids, including THC which is already a legal pharmaceutical, and CBD, which is non-psychoactive, is not a central nervous system depressant and has no risk of overdose."

Not only is there abundant evidence that cannabinoids kill cancer cells, Armentano says, "Investigators now even understand the mechanism of action; in other words, they know how and why cannabinoids kill cancerous cells and halt the spread of malignant tumors."

The question of whether these cannabis compounds can cure cancer in people, he says, "ought to have been already answered decades ago."

Bruce Mirken is a San Francisco-based writer and media consultant who served as director of communications for the Marijuana Policy Project from 2001 to 2009.

http://www.alternet.org/drugs/145159/the_marijuana_cancer_cure_cult/?page=entire



Willie Nelson: Hemp and the Family Farm

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October 09, 2006

Willie Nelson called me one day and asked if he could appear as a guest in our Time 4 Hemp Studios. To discuss how hemp can help the family farm. On 6/6/91 we taped live. I later went on the 91'hemp tour and we were able to get all ten shows into 99 cities in 44 states.

Check out my other hemp related videos and music at www.digitalHemp.com/
<http://www.youtube.com/watch?v=k6tA3HxA9oQ&NR=1>

Manitoba Harvest Hemp Foods & Oils - Harvest Video

December 09, 2006

Short clip put together by Manitoba Harvest to give you a glimpse into hemp seed harvesting.

<http://www.youtube.com/watch?v=SDNDdv7hU-U&NR=1>

Manitoba Harvest CBC National News Oct 31, 2007

Manitoba Harvest Hemp Foods & Oils featured on the Made in Canada show. CBC National News.

http://www.youtube.com/watch?v=6A1Y574YL_4&feature=related

Harvest of hemp as a biogas substrate

Hemp is being harvested for the utilization as a substrate for biogas production.

A standard forage harvester is used to cut and chop hemp. The hemp is then collected and pressed into a silage tube for storage or used directly in the biogas process (anaerobic digestion).

The video was uploaded by Thomas Prade, PhD student at the Swedish University of Agricultural Sciences (www.SLU.se) in Alnarp, Sweden. Researchers involved in the project: Sven-Erik Svensson, Thomas Prade

The field trials are part of a research project financed by Lunds Energi AB and Partnerskap Alnarp

<http://www.youtube.com/watch?v=bcZK-9GXPAY&NR=1>

Hemp Farming

[hempworkerscoop](#)

February 21, 2009 - Hemp farmers and processors speak about the viability and practical details of hemp farming.

Great shots of big hemp fields, plants and seeds. Hemp is a viable sustainable alternative crop for North America

<http://www.youtube.com/watch?v=wspw-SdyGDE&feature=related>

Hemp Building Materials

Hemp can make a cement-like substance that is stronger & lighter than traditional cement.

<http://www.youtube.com/watch?v=8AzbWzWk8A&NR=1>

Description: OldBuilders HEMP HOUSE

The First completed hemp building in Ireland Clones, County Monaghan

Other acknowledgements

This small hemp building is built similar to a standard timber frame house with a mix of hemp shiv and hydraulic lime structured around the timber. Finish is with a Lime rendering inside and out. Such building methods have the ability to be CO2 negative for

the construction and result in a healthy breathable energy saving home. This 42 sq meter building is to be used as office space. For further information please contact [www . oldbuilders . com](http://www.oldbuilders.com) 086 8236451, or Eco Habitats on 07842276.
http://www.youtube.com/watch?v=TMNBz0qx_Gc&NR=1

and

Building with Hemp Part One of Two

<http://www.youtube.com/watch?v=FcctSvVFheA&NR=1>

and Part Two of Two

<http://www.youtube.com/watch?v=b6eMdqJbQI4&NR=1>

Ron Paul & Hemp for American Farmers

[Economist articles in description]

A video consisting of an US Government history lesson about hemp which leads into an argument for hemp and then Ron Paul's Hemp legislation. Hemp has the potential to be a huge boon for American farmers and the US economy all while helping the environment and improving US security by lowering our reliance on foreign oil...and Ron Paul is the only candidate in favor of legislation to allow American Farmers to grow it.

(Economist - 6/23/07)

Nowadays farmers are banned from growing hemp without a permit from the Drug Enforcement Administration (DEA), which usually refuses to grant one. So many hemp products in America—food, lotions, clothing, paper and so forth—are imported from China or Canada, where farmers have been allowed to grow hemp commercially since 1998.

Hemp grows so easily that **few pesticides or even fertilizers are needed**. "Feral" hemp is said to grow by the roadside in Iowa and Nebraska. Barbara Filippone, owner of a hemp fabric company called Enviro Textiles, says demand has rocketed—sales are growing by 35% a year. Nutiva, a California-based hemp company that sells hemp bars, shakes and oils, saw sales rise from under \$1m three years ago to \$4.5m last year. "Hemp is the next soy," predicts John Roulac, Nutiva's founder.

American farmers would love to grow hemp. North Dakota, which in 1999 became the first state to allow industrial hemp farming, has taken the lead. This week two farmers from the state filed a lawsuit to force the DEA to issue permits to grow hemp; the farmers had applied for permits back in February, thus far to no avail. Ron Paul, a Texas congressman and presidential candidate, could win over farmers in Iowa because of his pro-hemp lobbying. In February he introduced a bill in Congress that would allow Americans to grow it.

<http://www.youtube.com/watch?v=vDLiHJFPWsM>

U.S. State Industrial Hemp Legislation

To date, [twenty-eight states](#) have introduced hemp legislation and sixteen have passed legislation; nine ([Hawaii](#), [Kentucky](#), [Maine](#), [Maryland](#), [Montana](#), [North Dakota](#), [Oregon](#), [Vermont](#) and [West Virginia](#)) have removed barriers to its production or research.

All state hemp bills and resolutions introduced since 1995 are archived in individual state pages, which are accessed in the clickable map of the United States below. The bills are also listed on a [single table on our State Legislation page](#).



Please see our [State Legislation page](#) for much more information.

U.S. Federal Industrial Hemp Legislation

On April 2, 2009 Rep. Ron Paul introduced [H.R. 1866](#), the "Industrial Hemp Farming Act of 2007," with ten original co-sponsors: Tammy Baldwin (D-WI), Wm. Lacy Clay (D-MO), Barney Frank (D-MA), Raúl Grijalva (D-AZ), Maurice Hinchey (D-NY), Tom McClintock (R-CA), George Miller (D-CA), Dana Rohrabacher (R-CA), Pete Stark (D-CA), and Lynn Woolsey (D-CA).

Please see our [Federal Legislation page](#) for much more information.

State Hemp Resolution

We have crafted a draft of a resolution, which is intended to be passed by state legislatures, that urges Congress to recognize industrial hemp as a valuable agricultural commodity and to pass legislation that removes barriers to state regulation of the commercial production of industrial hemp. This is also a great way to educate state legislators and get a hemp farming bill passed in the future as well.

The Medicine Plant

Wednesday, 10 March 2010 09:29

Cannabis – "The Medicine Plant"

by Al Byrne, co-founder, Patients Out of Time

It has been 80 years since an American medical school taught its students about the clinical applications of cannabis utilized to treat the ill. It will be 10 years in the spring of 2010 that Patients Out of Time has been re-establishing clinical cannabis knowledge in the medical and nursing communities.

Much is written these days of a need for more cannabis research. We are all for more work to be done to find unknown and exciting possibilities for cannabis treatment but we have enough science now to know beyond any line of credible doubt that cannabis is a medicine and a safe one. The research Patients Out of Time has assembled is world-wide in scope. It is an enormous collection of science from around the globe. An assemblage of medical cannabis science from the earliest research through that conducted up until 2002 can be found at www.drugscience.org. Here Dr. Jon Gettman and Patients Out of Time, with the assistance of other groups, have posted a copy of [The Petition to Reschedule Cannabis](#).

The Petition, defined as a demand in this instance, asks the federal government to consider the submitted research and rule up or down if cannabis is medicine. After taking the full three years allowed by law the DEA finally passed the request to the Department of Health and Human Services. At present that institution is almost two years late by law in answering the petition's request. Patients Out of Time can only assume that HHS is unwilling to admit cannabis is medicine for political reasons. The Petition's authors await the new Surgeon General who is the responsible agent to answer this demand.

A lot has been written and debated, almost always by lay folks who have no medical education, about the shortcomings of cannabis and especially that the medical demand for cannabis is nothing but a cover for cannabis legalization for recreational use. Cannabis used medically does not work for all patients. No medicine has that capability. But it is the safest plant substance for a human to use in any capacity known to mankind. It is not just the oft quoted DEA Administrative Law Judge Young that reached that conclusion, it is held by every toxicologist that ever studied the LD-50 (LD or lethal dose, the amount of a substance that kills 50% of those tested) of cannabis. It can't kill you no matter how much you inhale or ingest.

As for the medical cannabis movement being a sham, accused by talking heads of no medical validity including federal government anti-cannabis professionals, to be a movement of doctors, nurses, scientists and advocates from around the world who have entered into a huge conspiracy, even creating mounds of false documentation that they deluded their professional counterparts into thinking was real, so they could smoke marijuana in their living rooms - is absurd. Yet that plays well in the media, the fire fanned by federal government propaganda. In reality the sophistication of the medical cannabis research grows exponentially around the world.

On April 15-17, 2010 in Warwick (Providence), RI, [The Sixth National Clinical Conference on Cannabis Therapeutics](#) will be held at the Crowne Plaza Hotel. Speakers from Canada, Jamaica, Brazil, Israel and the US will present their state-of-the-art findings. Dr. Mechoulam, pioneer cannabis researcher and the investigator that isolated and identified delta-9- THC in cannabis will discuss his 45 plus years in the field of cannabis science and his latest findings which include the use of cannabis for head trauma and PTSD symptoms exhibited by injured Israeli soldiers, male and female. Dr. Andrew Weil, author and world famous alternative medical educator and physician will address the attendees by a live video feed during a benefit dinner party. Dr. Lyle Craker, Professor at the U. of Massachusetts will address his years-long struggle to grow and study medical cannabis strains at his university. Speakers will discuss cannabis use as an oral medicine, as a topical as well as an inhalant. Participants will hear of cannabis use for osteoporosis, as an ophthalmic preparation, for muscle spasms, MS, Parkinson's, epilepsy, bipolar disorder and social anxiety, pain, and it's interaction with opioids and other medications.

If this conference and the research that will be presented is somehow an excuse for legalization it's news to us at Patients Out of Time. We are the leading cannabis educational group on the North American continent. Our IRS designation is an "educational charity" and all members are unpaid volunteers. We do have a complimentary organization in Europe, The [International Association for Cannabinoid Medicines](#) (IACM) that holds its cannabis educational forums on odd numbered years while Patients Out of Time holds ours on the even years. We are also led by the four living federally supplied cannabis patients and a cadre of clinical cannabis MD's and RN's with years of clinical cannabis experience in all medical fields from addictions to hospice.

In this respect we are a unique organization in the cannabis debate. Other cannabis organizations are essentially for legalization of cannabis that includes the use as a medicine. Patients Out of Time finds this approach by groups like MPP and NORML to be confusing the media and public with two messages from one source that are different in content and execution. We have no opinion about legal cannabis for recreation, only on its medical use. Our organization does not use words such as Americans, National or the slang term marijuana to identify its purpose, the first word in our name and in our minds is – patients. Patients Out of Time is not headed by a spokesperson that is a professional administrator, a lawyer or a fund raiser as are the other cannabis groups named - our President is a nurse.

Patients Out of Time, founded in VA in 1995 as a non-profit, has established its credibility as an organization that provides accurate and unimpeachable documentation of medicinal cannabis efficacy. In our years of existence, holding five national conferences, the production of dozens of medical cannabis lectures available on You Tube and Google video, books and other published documents, our work has never been challenged as inaccurate by any individual, organization or government. We will keep that level of quality in our work.

As patients or those of you who care for the ill or a special person, cannabis should be available to you or them as an option to exercise in maintaining health or treating illness. This to us is a given but all is not easy and this cannabis debate is complicated by health professionals themselves. As you may have concluded at the start of this essay, Patients Out of Time saw a need unfulfilled. The need of course was the lack of knowledge held by nurses and doctors about cannabis the medicine. While we have educated scores of health professionals, the vast number remain uninformed about medicinal cannabis. No doctor, nurse practitioner, physician's assistant or registered nurse is about to give a medicine to a patient without understanding the risks of such administration. You may bark to the world about its safety and reliability but to a health professional that is not enough.

Professionals want a product that is known to be safe, its origin and rearing documented. What strain is it? Were pesticides used? Fertilizers? Is it free of contaminants? What is the proper dose of this strain? Legitimate, responsible questions that need to be and can be answered. First the health professional needs to know what to ask let alone understand the answer. That is where we come in as a group and where you can make a difference, in your own life and others as well.

The conferences I have referenced are being placed on-line at the web site of the University of California, San Francisco School of Medicine. Direct link is available at www.medicalcannabis.com. The 2008 forum held in Monterey, CA is on-line and the 2006 forum held in Santa Barbara, CA in 2006 will be available late March 2010. This professionally directed education of cannabis efficacy is available to your doctor and your nurse. It is up to you to tell them about this site. It is up to you to ensure the entire network of patients and groups you work with are informed of this accredited knowledge base. It is your effort that will make the media look at the site, the huge cache of cannabis education, the dozens of organizations that have signed on to [our support list](#), the partnership that Patients Out of Time has forged with the ANA and the AMA to educate US physicians and nurses about cannabis. Your effort is needed. Now.

Please do your part. Encourage your care providers to attend the April 2010 forum. See that they and others know the science is good and available on-line.

Keep us in your thoughts because all of us are Patients Out of Time.

- Al Byrne

Thursday, 18 February 2010 10:14

UC Studies Show Marijuana Has Therapeutic Value, Reports to Legislature

First results in United States in 20 years from clinical trials of smoked cannabis - February 17, 2010

Researchers from the University of California's Center for Medicinal Cannabis Research (CMCR) have found "reasonable evidence that cannabis is a promising treatment" for some specific, pain-related medical conditions. Their findings, presented today to the California legislature and public, are included in a report available on the CMCR web site at <http://www.cmcr.ucsd.edu>.

"We focused on illnesses where current medical treatment does not provide adequate relief or coverage of symptoms," explained CMCR director, Igor Grant, MD, Executive Vice-Chair of the Department of Psychiatry at the UCSD School of Medicine. "These findings provide a strong, science-based context in which policy makers and the public can begin discussing the place of cannabis in medical care."

Researchers have completed five scientific clinical trials, with more in progress. These studies showed that cannabis can be helpful in easing pain in selected syndromes caused by injury or diseases of the nervous system and possibly for painful muscle spasms due to multiple sclerosis.

"These scientists created an unparalleled program of systematic research, focused on science-based answers rather than political or social beliefs," said Senator John Vasconcellos, original author of The Medical Marijuana Research Act of 1999 (SB847) which led to the creation of the CMCR.

Study results have been published in high-impact medical journals, garnering national and international attention which prompted leading experts to come together and foster scientific dialog on the possible uses of cannabis as a therapeutic agent. More study will be necessary to figure out the mechanisms of action and the full therapeutic potential of cannabinoid compounds, according to the UC researchers.

About The Center for Medicinal Cannabis Research:

The CMCR was created in 2000 (through the passage of SB847) to conduct clinical and pre-clinical trials of cannabinoids, including smoked marijuana, to provide evidence, one way or the other, to answer the question "Does marijuana have therapeutic value?" The program's purpose is to oversee objective, high-quality, medical research that would enhance understanding of the efficacy and adverse effects of marijuana as a pharmacological agent. The project was never to be construed as encouraging or sanctioning the social or recreational use of marijuana. <http://www.cmcr.ucsd.edu>

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Media Contact: Kim Edwards, 619-543-6163, kedwards@ucsd.edu

Saturday, 23 January 2010 12:34

WAMM Settles with U. S. Department of Justice

In September, 2002, federal agents raided the grounds of the Wo/Men's Alliance for Medical Marijuana, located in Santa Cruz, CA, destroying a community garden belonging to chronically and terminally ill patients. WAMM, the City of Santa Cruz, and others sued the Justice Department (then headed by John Ashcroft), soon winning an injunction against further action by the government. On October 19, 2009 the Justice Department codified a policy shift announced last spring by the Obama Administration - that federal prosecutors in the legal medical marijuana states are not to prosecute individuals that are using medical cannabis "in clear and unambiguous compliance" with state laws.



Yesterday Santa Cruz and [WAMM](#) agreed to dismiss their lawsuit, with the stipulation that, if the government failed to abide by its new rules, the suit will be reinstated. Representing all the members of WAMM, Valerie and Mike Corral issued a statement to the court, reprinted here. Following the letter is a press release by the ACLU, one of several parties that represented WAMM in the lawsuit. Also, there are links to videos, including two times that Valerie Corral spoke to our Cannabis Therapeutics Conferences - in 2002 (before the raid), and again in 2004.

Physicians are in a legal/ethical quandary: Science shows that cannabis is a safe and effective medication yet the federal government has placed it in Schedule I of the Controlled Substances making it illegal for them to prescribe. In the historic rescheduling petition of NORML and ACT vs the DEA, the DEA's Administrative Law Judge, Francis Young, concluded in 1988 that cannabis must be removed from Schedule I. After reading all of the evidence, pro and con, he noted that cannabis was "one of the safest therapeutic substances known to man." If this herbal medicine is so safe, surely physicians should be able to prescribe it to their patients.

Patients Out of Time strongly believes that physicians must educate themselves on the science of medicinal cannabis and the endocannabinoid system. Once educated, physicians must be proactive and work towards ending the cannabis prohibition. It is not OK to simply shy away from or ignore this issue. Cannabis has the potential to improve the quality of life for countless patients. They need and expect your support. <http://www.medicalcannabis.com/Journal-2010/santa-cruz-vs-holder-settled>

<http://www.medicalcannabis.com/>

The Fifth National Clinical Conference on Cannabis Therapeutics

https://www.cmecalifornia.com/ce-bin/owa/pkg_disclaimer_html.display?ip_mode=secure&ip_company_code=CECA&ip_test_id=14422&ip_cookie=34055651

Education - Legislation - Advocacy

Vote Hemp is a national, single-issue, non-profit advocacy group founded in 2000 by members of the hemp industry to remove barriers to industrial hemp farming in the U.S. through education, [legislation](#) and advocacy. We work to build grassroots support for hemp through voter education, registration and mobilization, as well as defend against any new laws, regulations or policies that would prohibit or restrict hemp trade.

Industrial hemp is the non-psychoactive, low-THC, [oilseed and fiber varieties](#) of the *Cannabis sativa* plant. Hemp has absolutely no use as a recreational drug.



May 17-23, 2010 is Hemp History Week!

A joint project of Vote Hemp and the Hemp Industries Association, *Hemp History Week* is looking for patriotic Americans to anchor and organize events in their hometown as part of a national grassroots, media and public education campaign.

To sign up, please [click here](#).

Please make a donation to Vote Hemp!

Vote Hemp depends entirely on contributions from supporters like you to do our work. Your [contribution](#) to us will help in many different ways.

We had an incredibly successful year in 2009 with Oregon and Maine passing hemp farming legislation, both bills signed into law, and Montana, New Mexico, North Dakota and Vermont all passing resolutions urging the federal government to allow the states to regulate industrial hemp farming. The passage of industrial hemp legislation on the state level is just one part of our multi-faceted strategy to get hemp farmed and processed here in the U.S. once again. With your help we can continue on our mission.

Overview

Vote Hemp seeks the full normalization of and a free market for industrial hemp in America. Vote Hemp's mission is to educate consumers, business owners, farmers and legislators about the many benefits of industrial hemp and to mobilize voters to elect pro-hemp politicians. Hemp is one of the few issues on the national debate that enjoys tremendous bipartisan and cross-cultural support. Democrats and Libertarians, Greens and Republicans, farmers and hippies, global corporations and small mom-and-pop businesses are all part of the broad coalition in favor of industrial hemp.

They all have one thing in common: an education in the facts.

QUICK CLICK GUIDE — click on the titles below to view summaries

[*The Vote Hemp Treatise*](#)

[*The Vote Hemp Report*](#)

[*Common Misperceptions About Hemp and Easy Answers*](#)

[*Congressional Research Service Report on Hemp*](#)

[*Hemp is Hip, Hot and Happening: So Why Are American Farmers Being Left Out?*](#)

[*Hemp Legislation*](#)

[*National Association of State Departments of Agriculture Adopts Pro-Hemp Resolution*](#)

[*National Conference of State Legislatures Adopts Pro-Hemp Resolution*](#)

[Letter From Hawaii Legislators to President Bush](#)

[Evaluating Interference of THC in Hemp Food Products With Employee Drug-Testing — Study Summary](#)

[Assessing the Impact of THC Uptake from Hemp Oil Cosmetics on Workplace Drug-Testing](#)

[USDA Research Shows Hemp Has Potential for Paper Production](#)

[DEA Eradication Efforts Target Hemp Instead of Cultivated Marijuana](#)

<http://www.votehemp.com/>

For Immediate Release
Tuesday, October 13, 2009



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**Farmers, Hemp Industry Leaders Arrested for Planting
Industrial Hemp at DEA Headquarters in Act of Civil
Disobedience to Protest 'Reefer Madness'**

***Fed Up Captains of Hemp Industry Plant Hemp Seed on DEA's Lawn with Ceremonial
Shovels***

*DEA's Continued Blockade of State Industrial Hemp Programs Violates Common Sense as well as
Obama's Presidential Directive to Federal Agencies to Respect States' Rights*

WASHINGTON, DC — At approximately 10:00 AM this morning, North Dakota farmer Wayne Hauge, Vermont farmer Will Allen, and fed up American entrepreneurs, who have dedicated their livelihoods to developing and marketing healthy, environmentally-friendly hemp products, for the first time turned to public civil disobedience with the planting of industrial hemp seed at DEA headquarters (700 Army Navy Dr Arlington, VA 22202) to protest the ban on hemp farming in the United States. Even though the U.S. is the largest market for hemp products in the world, and industrial hemp is farmed throughout Europe, Asia and Canada, not a single American farmer has the right to grow the versatile crop which is used for food, clothing, body care, paper, building materials, auto paneling and more.

Hoping to focus the attention of the Obama Administration on halting DEA interference, North Dakota Farmer Wayne Hauge; Founder of Cedar Circle Organic Farm in Vermont Will Allen; Hemp Industries Association (HIA) President Steve Levine; Dr. Bronner's Magic Soaps President David Bronner; Vote

Hemp Communications Director Adam Eiding and Founder of Livity Outernational Hemp Clothing, Issac Nicholson were arrested while digging up the DEA's lawn to plant industrial hemp seed imported from Canada. At this time, they are currently being held in Arlington County jail and are awaiting charges. They are expected to be released later this afternoon and will be available for interviews upon release. The six protesters planted hemp seeds with ceremonial chrome shovels engraved with:

**Hemp Planting Oct. 2009 ~ DEA Headquarters ~ American Farmers Shall Grow Hemp Again
Reefer Madness Will Be Buried**

Mr. Hauge is licensed by North Dakota to cultivate and process non-drug industrial hemp, just as Canadian farmers across the border have done profitably for over ten years supplying the booming U.S. market. However, the DEA refuses to distinguish non-drug industrial hemp cultivars grown for millennia for seed and fiber and has unconstitutionally blocked all state hemp programs such as North Dakota's. Mr. Hauge, along with North Dakota State Rep. David Monson, sued the DEA in the U.S. District Court of North Dakota in 2007, and the case is currently before the Eighth Circuit Court of Appeals. "In recent years there has been strong growth in demand for hemp in the U.S., but the American farmer is being left out while Canadian, European and Chinese farmers fill the void created by outdated federal policy," said fourth-generation farmer Hauge. "When hemp is legalized, land grant universities across the nation will develop cultivars suitable to different growing regions to enhance yield and explore innovative uses such as cellulosic ethanol."

Pictures and video of the action for free and unrestricted use, along with hemp farming footage and background information are available upon request in hardcopy and online. An HIA produced video of the action will also be posted, after 6:00 PM on 10/13 at: www.votehemp.com/DEAhempplanting.html

In the back drop of the spectacle at DEA headquarters, dozens of hemp business owners in town attending the HIA convention over the weekend fanned out across Capitol Hill to lobby lawmakers in support of hemp legislation introduced by Representatives Ron Paul (R-TX) and Barney Frank (D-MA) that would permit states to cultivate non-drug industrial hemp under state industrial hemp programs. Nine states have such programs, but their implementation has been blocked by DEA bureaucratic intransigence. This spring, however, President Obama instructed federal agencies to respect state laws in a presidential directive on federal pre-emption:

"Executive departments and agencies should be mindful that in our federal system, the citizens of the several States have distinctive circumstances and values, and that in many instances it is appropriate for them to apply to themselves rules and principles that reflect these circumstances and values. As Justice Brandeis explained more than 70 years ago, 'it is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory and try novel social and economic experiments without risk to the rest of the country.'"

Source: www.whitehouse.gov/the_press_office/Presidential-Memorandum-Regarding-Preemption/

Vote Hemp and the HIA are dedicated to a free market for low-THC industrial hemp and to changes in current policy to allow U.S. farmers to once again grow this agricultural crop. Dr. Bronner's Magic Soaps President and Vote Hemp Director David Bronner stated: "Dr. Bronner's has grown into the leading natural soap brand in the U.S. since incorporating hemp oil in 1999, due in significant part to the unsurpassed smoothness it gives our soaps. As an American business, we want to give our money to American farmers and save on import and freight costs. In this difficult economy, we can no longer indulge the DEA's self-serving hemp hysteria."

Vote Hemp is a national, single-issue, nonprofit organization dedicated to the acceptance of and free market for low-THC industrial hemp and to changes in current law to allow U.S. farmers to once again grow this agricultural crop. More information about hemp legislation and the crop's many uses may be found at www.VoteHemp.com or www.HempIndustries.org. BETA SP or DVD Video News Releases featuring footage of hemp farming in other countries are available upon request by contacting Adam Eiding at 202-744-2671. http://votehemp.com/PR/10-13-09_vh_DEA_hempplanting.html

Hemp: The Solution for America's Greening Economy

August 03, 2008



http://www.visionmagazine.com/archives/0808/earth_watch.html

Let's do an experiment. Access in your mind everything you are wearing and what it's made out of. Now think about the last time you bathed. What kind of soap did you use? Look at the paper you're reading these words on. What is it made out of? Finally, what did you eat today? Was it organic and healthy? Did you answer "hemp" for any of these questions? If you did, kudos to you for saving the planet by just being yourself—you're a remarkable environmentalist. We at Vote Hemp, a non-profit hemp advocacy group, salute your conscious consumer choices. You deserve a tax cut for all the savings to the planet's ecosystems you are generating.

Oh, you're not eating, wearing and bathing in hemp? Well that's cool, because if you're reading this, you can make a change to green your life today.

If you are having a hard time answering any of the questions above, you're not alone. The vast majority of Americans are consuming unhealthy, synthetic products every day. While more people want a greener lifestyle, chances are that you're wearing at least some petrochemical-based clothing (or cotton sprayed with chemical pesticides), you bathed in petroleum-based detergent soaps, the paper in your hand came from trees, and the food you ate wasn't as nutritious as it could have been.

Because those products are not organic, biodegradable, or sustainable, they negatively impact the environment long after we are through with them and make it harder for people to have a healthy diet.

The big question in the media this year has been how to be a consumer and not destroy ourselves and the planet at the same time. How do we feed, clothe, and house a rapidly multiplying global population organically and sustainably? How do we print paper and not sacrifice forests? How do we get easily digestible protein and nutritious omega-3 essential fatty acids (EFAs) into our diets without eating meat or fish?

Cannabis, perhaps the most versatile plant known to humans, has been grown for thousands of years to make everything from durable fabric, nutritious food, and a plethora of environmentally friendly products. Because nearly everything can be made out of hemp and none of the plant goes to waste, it's the crop America needs to grow if we are to maximize our farmland while reducing pressure to cultivate and chop down all our remaining wild places.

Yet in America, farmers will be sent to jail if they grow hemp, which today is legally imported into the U.S. at a value of \$330 million a year.

It's not a surprise that the media and major corporations have recently figured out that the answer to creating many needed environmental improvements in our lives can be found in hemp. Hemp is not grown in the U.S. because the federal government continues to ban it, along with its cousin, marijuana. Essentially, our greener future is on hold because of a 51-year-old irrational fear held by politicians in Washington, DC which says that if we legalized hemp, children will be corrupted and smoke even more pot than they already do. Should we settle for the next president irrationalizing that a healthy hemp breakfast cereal eaten by an eco-conscious child wearing hemp clothing that is durable and biodegradable is justification for a war on farmers and our economy?

So are you ready to do something about this? Then it's time to make conscious decisions about how and where you spend your money.

With more hemp products in the marketplace than ever before, it is possible to be a consumer without contributing to ground water pollution from pesticides or discarded formaldehyde-treated plywood. A discarded hemp fiber board is 100 percent biodegradable and renewable every year. Paper, auto parts and building materials are just a few of the innovative uses of hemp stalks that now must be imported from other countries such as Canada, China, and Germany.
http://current.com/items/89166240_hemp-the-solution-for-america-s-greening-economy.htm

Hemp - Could Save America

The Weed That Can Change The World

From Varied Sources

2-25-4

HEMP FACTS

1) Hemp is among the oldest industries on the planet, going back more than 10,000 years to the beginnings of pottery. The Columbia History of the World states that the oldest relic of human industry is a bit of hemp fabric dating back to approximately 8,000 BC.

2) Presidents Washington and Jefferson both grew hemp. Americans were legally bound to grow hemp during the Colonial Era and Early Republic. The federal government subsidized hemp during the Second World War and US farmers grew about a million acres of hemp as part of that program.

3) Hemp Seed is far more nutritious than even soybean, contains more essential fatty acids than any other source, is second only to soybeans in complete protein (but is more digestible by humans), is high in B-vitamins, and is 35% dietary fiber. Hemp seed is not psychoactive and cannot be used as a drug. See TestPledge.com

4) The bark of the hemp stalk contains bast fibers which are among the Earth's longest natural soft fibers and are also rich in cellulose; the cellulose and hemi-cellulose in its inner woody core are called hurds. Hemp stalk is not psychoactive. Hemp fiber is longer, stronger, more absorbent and more insulative than cotton fiber.

5) According to the Department of Energy, hemp as a biomass fuel producer requires the least specialized growing and processing procedures of all hemp products. The hydrocarbons in hemp can be processed into a wide range of biomass energy sources, from fuel pellets to liquid fuels and gas. Development of biofuels could significantly reduce our consumption of fossil fuels and nuclear power.

6) Hemp grows well without herbicides, fungicides, or pesticides. Almost half of the agricultural chemicals used on US crops are applied to cotton.

7) Hemp produces more pulp per acre than timber on a sustainable basis, and can be used for every quality of paper. Hemp paper manufacturing can reduce wastewater contamination. Hemp's low lignin content reduces the need for acids used in pulping, and it's creamy color lends itself to environmentally friendly bleaching instead of harsh chlorine compounds. Less bleaching results in less dioxin and fewer chemical byproducts.

8) Hemp fiber paper resists decomposition, and does not yellow with age when an acid-free process is used. Hemp paper more than 1,500 years old has been found. It can also be recycled more times.

9) Hemp fiberboard produced by Washington State University was found to be twice as strong as wood-based fiberboard.

10) Eco-friendly hemp can replace most toxic petrochemical products. Research is being done to use hemp in manufacturing biodegradable plastic products: plant-based cellophane, recycled plastic mixed with hemp for injection-molded products, and resins made from the oil, to name just a very few examples.

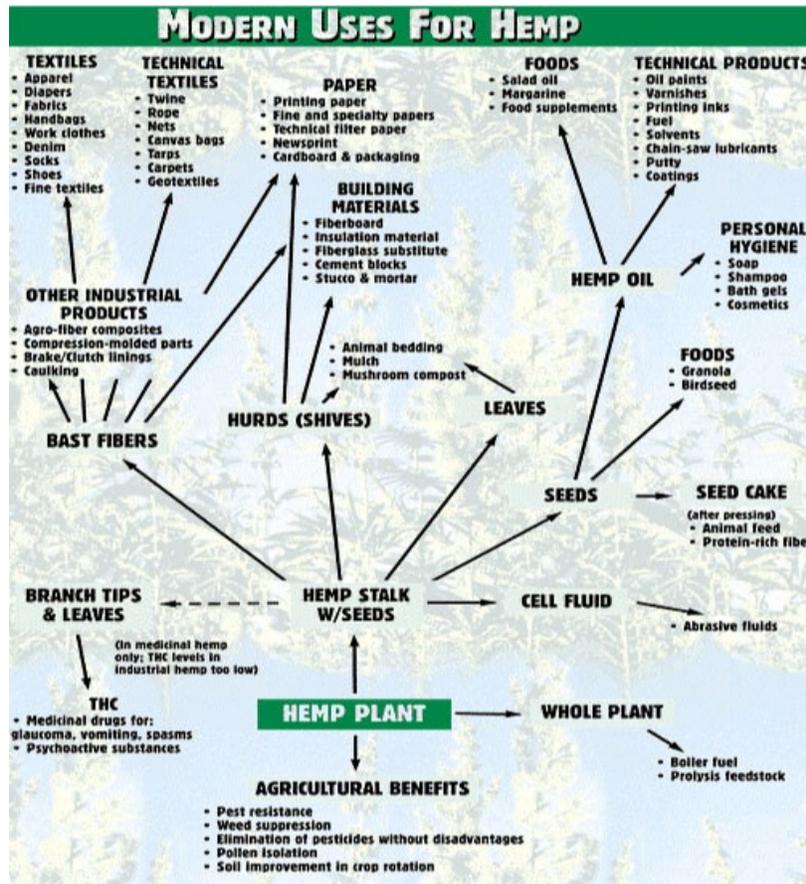
Hemp History

Hemp is among the oldest industries on the planet, going back more than 10,000 years to the beginnings of pottery. The Columbia History of the World states that the oldest relic of human industry is a bit of hemp fabric dating back to approximately 8,000 BC.



Presidents Washington and Jefferson both grew hemp. Americans were legally bound to grow hemp during the Colonial Era and Early Republic.

In 1937 Congress passed the Marihuana Tax Act which effectively began the era of hemp prohibition. The tax and licensing regulations of the act made hemp cultivation unfeasible for American farmers. The chief promoter of the Tax Act, Harry Anslinger, began promoting anti-marijuana legislation around the world. To learn more about hemp prohibition visit <http://www.JackHerer.com> or check out "The Emperor Wears No Clothes" by Jack Herer



Then came World War II. The Japanese attack on Pearl Harbor shut off foreign supplies of "manilla hemp" fiber from the Phillipines. The USDA produced a film called Hemp For Victory to encourage US farmers to grow hemp for the war effort. The US government formed War Hemp Industries and subsidized hemp cultivation. During the War and US farmers grew about a million acres of hemp across the midwest as part of that program.

After the war ended, the government quietly shut down all the hemp processing plants and the industry faded away again.

During the period from 1937 to the late 60's the US government understood and acknowledged that Industrial Hemp and marijuana were distinct varieties of the cannabis plant. Hemp is no longer recognized as distinct from marijuana since the passage of the Controlled Substances Act (CSA) of 1970. This is despite the fact that a specific exemption for hemp was included in the CSA under the definition of marijuana.

The United States government has published numerous reports and other documents on hemp dating back to the beginnings of our country. Below is a list of some of the documents that have been discovered:

- * 1797: SECRETARY OF WAR: U.S.S. CONSTITUTION'S HEMP
- * 1810: JOHN QUINCY ADAMS - RUSSIAN HEMP CULTIVATION
- * 1827: U.S. NAVY COMMISSIONER - WATER-ROTTED HEMP
- * 1873: HEMP CULTURE IN JAPAN
- * 1895: USDA - HEMP SEED
- * 1899: USDA SECRETARY - HEMP
- * 1901: USDA LYSTER DEWEY RE; HEMP & FLAX SEED
- * 1901: USDA LYSTER DEWEY 13 PAGE ARTICLE ON HEMP
- * 1903: USDA LYSTER DEWEY RE; PRINCIPAL COMMERCIAL PLANT FIBERS
- * 1909: USDA SECRETARY - FIBER INVESTIGATIONS: HEMP/FLAX
- * 1913: USDA LYSTER DEWEY - HEMP SOILS, YIELD, ECONOMICS
- * 1913: USDA LYSTER DEWEY - TESTS FOR HEMP, LIST OF PRODUCTS
- * 1916: USDA BULLETIN 404 - HEMP HURDS AS A PAPER MAKING MATERIAL
- * 1917: USDA - HEMP SEED SUPPLY OF THE NATION
- * 1917: USDA - CANNABIS
- * 1927: USDA LYSTER DEWEY RE; HEMP VARIETIES
- * 1931: USDA LYSTER DEWEY RE; HEMP FIBER LOSING GROUND
- * 1943: USDA - HEMP FOR VICTORY - DOCUMENTARY FILM
- * 1947: USDA - HEMP DAY LENGTH & FLOWERING
- * 1956: USDA - MONOECIOUS HEMP BREEDING IN THE U.S.

These documents and many more are published online by USA hemp historian extraordinaire, John E. Dvorak. His Digital Hemp History Library is the most complete source for historical hemp documents and data anywhere. To visit the Library click here.

You can also check out literary references to Industrial Hemp from Aesop's Fables to the present:

http://www.ofields.com/OFIELDS_HEMP_HISTORY.html

<http://www.thehia.org/hempfacts.htm>

Hemp: A New Crop with New Uses for North America*

Ernest Small and David Marcus

**This paper was considerably improved by criticism provided by A. McElroy.*

“Hemp” refers primarily to *Cannabis sativa* L. (Cannabaceae), although the term has been applied to dozens of species representing at least 22 genera, often prominent fiber crops. For examples, Manila hemp (abaca) is *Musa textilis* Née, sisal hemp is *Agave sisalina* Perrine, and sunn hemp is *Crotolaria juncea* L. Especially confusing is the phrase “Indian hemp,” which has been used both for narcotic Asian land races of *C. sativa* (so-called *C. indica* Lamarck of India) and *Apocynum cannabinum* L., which was used by North American Indians as a fiber plant. *Cannabis sativa* is a multi-purpose plant that has been domesticated for bast (phloem) fiber in the stem, a multi-purpose fixed oil in the “seeds” (achenes), and an intoxicating resin secreted by epidermal glands. The common names hemp and marijuana (much less frequently spelled marihuana) have been applied loosely to all three forms, although historically hemp has been used primarily for the fiber cultigen and its fiber preparations, and marijuana for the drug cultigen and its drug preparations. The current hemp industry is making great efforts to point out that “hemp is not marijuana.” Italicized, *Cannabis* refers to the biological name of the plant (only one species of this genus is commonly recognized, *C. sativa* L.). Non-italicized, “cannabis” is a generic abstraction, widely used as a noun and adjective, and commonly (often loosely) used both for cannabis plants and/or any or all of the intoxicant preparations made from them.

Probably indigenous to temperate Asia, *C. sativa* is the most widely cited example of a “camp follower.” It was pre-adapted to thrive in the manured soils around man’s early settlements, which quickly led to its domestication (Schultes 1970). Hemp was harvested by the Chinese 8500 years ago (Schultes and Hofmann 1980). For most of its history, *C. sativa* was most valued as a fiber source, considerably less so as an intoxicant, and only to a limited extent as an oilseed crop. Hemp is one of the oldest sources of textile fiber, with extant remains of hempen cloth trailing back 6 millennia. Hemp grown for fiber was introduced to western Asia and Egypt, and subsequently to Europe somewhere between 1000 and 2000 BCE. Cultivation in Europe became widespread after 500 ce. The crop was first brought to South America in 1545, in Chile, and to North America in Port Royal, Acadia in 1606. The hemp industry flourished in Kentucky, Missouri, and Illinois between 1840 and 1860 because of the strong demand for sailcloth and cordage (Ehrensing 1998). From the end of the Civil War until 1912, virtually all hemp in the US was produced in Kentucky. During World War I, some hemp cultivation occurred in several states, including Kentucky, Wisconsin, California, North Dakota, South Dakota, Minnesota, Indiana, Illinois, Ohio, Michigan, Kansas, and Iowa (Ehrensing 1998). The second world war led to a brief revival of hemp cultivation in the Midwest, as well as in Canada, because the war cut off supplies of fiber (substantial renewed cultivation also occurred in Germany for the same reason). Until the beginning of the 19th century, hemp was the leading cordage fiber. Until the middle of the 19th century, hemp rivaled flax as the chief textile fiber of vegetable origin, and indeed was described as “the king of fiber-bearing plants,—the standard by which all other fibers are measured” (Boyce 1900). Nevertheless, the Marihuana Tax Act applied in 1938 essentially ended hemp production in the United States, although a small hemp fiber industry continued in Wisconsin until 1958. Similarly in 1938 the cultivation of *Cannabis* became illegal in Canada under the Opium and Narcotics Act.

Hemp, grown under license mostly in Canada, is the most publicized “new” crop in North America. Until very recently the prohibition against drug forms of the plant prevented consideration of cultivation of fiber and oilseed cultivars in Canada. However, in the last 10 years three key developments occurred: (1) much-publicized recent advances in the legal cultivation of hemp in western Europe, especially for new value-added products; (2) enterprising farmers and farm groups became convinced of the agricultural potential of hemp in Canada, and obtained permits to conduct experimental cultivation; and (3) lobby groups convinced the government of Canada that narcotic forms of the hemp plant are distinct and distinguishable from fiber and oilseed forms. In March 1998, new regulations (under the Controlled Drugs and Substances Act) were provided to allow the commercial development of a hemp industry in Canada, and since then more than a thousand licenses have been issued. Hectares licensed for cultivation for 1998–2001 were respectively, 2,500, 14,200, 5,487, and 1,355, the decreasing trend due to a glut of seed produced in 1999 and pessimism over new potential regulations barring exports to the US. Information on the commercial potential of hemp in Canada is in Blade (1998), Marcus (1998), and Pinfold Consulting (1998). In the US, a substantial trade in hemp products has developed, based on imports of hemp fiber, grain, and oil. The American agricultural community has observed this, and has had success at the state level in persuading legislators of the advisability of experimental hemp cultivation as a means of evaluating the wisdom of re-establishing American hemp production. However, because of opposition by the federal government, to date there has only been a small experimental plot in Hawaii. Information on the commercial potential of hemp in the US is presented in the following.

Cannabis sativa is extremely unusual in the diversity of products for which it is or can be cultivated. Popular Mechanics magazine (1938) touted hemp as “the new billion dollar crop,” stating that it “can be used to produce more than 25,000 products, ranging from dynamite to Cellophane.” Table 1 presents the principal products for which the species is cultivated in Europe, all of which happen to be based on fiber. This presentation stresses the products that hold the most promise for North America, which also include a considerable range of oilseed applications (Table 2; Fig. 1).

Table 1. Hemp fiber usage in the European Union in 1999 (after Karus et al. 2000).

Class of product	Quantity consumed (tonnes)	Relative percentage
Specialty pulp (cigarette paper, bank notes, technical filters, and hygiene products)	24,882	87
Composites for autos	1,770	6
Construction & thermal insulation materials	1,095	4
Geotextiles	234	0.8
Other	650	2.2
Total	26,821	100

Table 2. Analysis of commercial *Cannabis* product potential in North America in order of decreasing value toward the right and toward the bottom.

Seeds (achenes)	Long ("bark) fiber	Woody stem core	Female floral (perigonal) bract	Whole plant
Confectionary, baked goods	Plastic-molded products	Animal bedding	Medicinal cannabinoids	Alcohol
Salad oil	Specialty papers	Thermal insulation	Essential oil (for flavor & perfume)	Fuel
Body care "cosmetics	Construction fiberboard	Construction (fiberboard, plaster board, etc.)	Insect repellent	Silage
Animal food (whole seeds for birds, presscake for mammalian livestock)	Biodegradable landscape matting & plant culture products			
Gamma-linolenic acid dietary supplements	Coarse textiles (carpets, upholstery)			
Specialty industrial oils	Fine textiles			

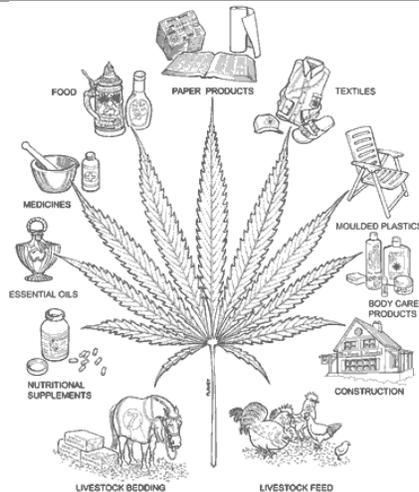


Fig. 1. Major uses of industrial hemp.

BASIC CATEGORIES OF *CANNABIS* AND THEIR FIELD ARCHITECTURE

Cannabis sativa is an annual wind-pollinated plant, normally dioecious and dimorphic, although sometimes monoecious (mostly in several modern European fiber cultivars). Figure 2 presents the basic morphology of the species. Some special hybrids, obtained by pollinating females of dioecious lines with pollen from monoecious plants, are predominantly female (so-called “all-female,” these generally also produce some hermaphrodites and occasional males). All-female lines are productive for some purposes (e.g. they are very uniform, and with very few males to take up space they can produce considerable grain), but the hybrid seed is expensive to produce. Staminate or “male” plants tend to be 10%–15% taller and are less robust than the pistillate or “female” (note the comparatively frail male in Fig. 3). So prolific is pollen production that an isolation distance of about 5 km is usually recommended for generating pure-bred foundation seed. A “perigonal bract” subtends each female flower, and grows to envelop the fruit. While small, secretory, resin-producing glands occur on the epidermis of most of the above-ground parts of the plant, the glands are very dense and productive on the perigonal bracts, which are accordingly of central interest in marijuana varieties. The root is a laterally branched taproot, generally 30–60 cm deep, up to 2.5 m in loose soils, very near the surface and more branched in wet soils. Extensive root systems are key to the ability of hemp crops to exploit deep supplies of nutrients and water. The stems are erect, furrowed, and usually branched, with a woody interior, and may be hollow in the internodes. Although the stem is often woody, the species is frequently referred to as a herb or forb. Plants vary enormously in height depending on genetic constitution and environment (Fig. 4), but are typically 1–5 m (heights of 12 m or more in cultivation have been claimed).



Fig. 2. *Cannabis sativa*. This superb composite plate by artist Elmer Smith, often reproduced at a very small scale and without explanation in marijuana books, is the best scientific illustration of the hemp plant ever prepared. 1. Flowering branch of male plant. 2. Flowering branch of female plant. 3. Seedling. 4. Leaflet. 5. Cluster of male flowers. 6. Female flower, enclosed by perigonal bract. 7. Mature fruit enclosed in perigonal bract. 8. Seed (achene), showing wide face. 9. Seed, showing narrow face. 10. Stalked secretory gland. 11. Top of sessile secretory gland. 12. Long section of cystolith hair (note calcium carbonate concretion at base). Reproduced with the permission of Harvard University, Cambridge, MA.



Fig. 3. Photograph of *Cannabis sativa*. Left, staminate (“male”) plant in flower; right, pistillate (“female”) plant in flower.



Fig. 4. United States National Institute of Health, University of Mississippi marijuana plantation site, showing variation in plant size. A tall fiber-type of hemp plant is shown at left, and a short narcotic variety (identified as “Panama Gold”) at right.

There is great variation in *Cannabis sativa*, because of disruptive domestication for fiber, oilseed, and narcotic resin, and there are features that tend to distinguish these three cultigens (cultivated phases) from each other. Moreover, density of cultivation is used to accentuate certain architectural features. Figure 5 illustrates the divergent appearances of the basic agronomic categories of *Cannabis* in typical field configurations

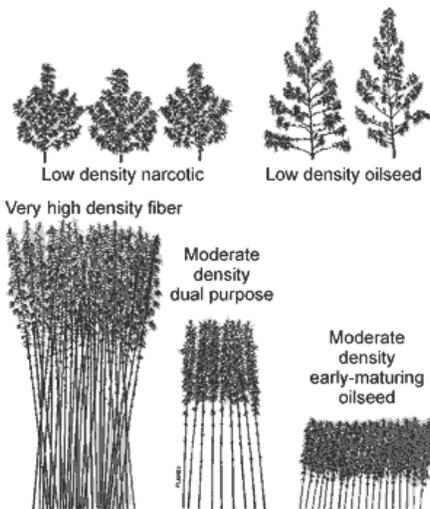


Fig. 5. Typical architecture of categories of cultivated *Cannabis sativa*. Top left: narcotic plants are generally low, highly branched, and grown well-spaced. Top right: plants grown for oilseed were traditionally well-spaced, and the plants developed medium height and strong branching. Bottom left: fiber cultivars are grown at high density, and are unbranched and very tall. Bottom center: “dual purpose” plants are grown at moderate density, tend to be slightly branched and of medium to tall height. Bottom right: some recent oilseed cultivars are grown at moderate density and are short and relatively unbranched. Degree of branching and height are determined both by the density of the plants and their genetic background.

Highly selected forms of the fiber cultigen possess features maximizing fiber production. Since the nodes tend to disrupt the length of the fiber bundles, thereby limiting quality, tall, relatively unbranched plants with long internodes have been selected. Another strategy has been to select stems that are hollow at the internodes, with limited wood, since this maximizes production of fiber in relation to supporting woody tissues. Similarly, limited seed productivity concentrates the plant's energy into production of fiber, and fiber cultivars often have low genetic propensity for seed output. Selecting monoecious strains overcomes the problem of differential maturation times and quality of male (staminate) and female (pistillate) plants (males mature 1–3 weeks earlier). Male plants in general are taller, albeit slimmer, less robust, and less productive. Except for the troublesome characteristic of dying after anthesis, male traits are favored for fiber production, in contrast to the situation for drug strains noted below. In former, labor-intensive times, the male plants were harvested earlier than the females, to produce superior fiber. The limited branching of fiber cultivars is often compensated for by possession of large leaves with wide leaflets, which obviously increase the photosynthetic ability of the plants. Since fiber plants have not generally been selected for narcotic purposes, the level of intoxicating constituents is usually limited.

An absence of such fiber-strain traits as tallness, limited branching, long internodes, and very hollow stems, is characteristic of narcotic strains. Drug forms have historically been grown in areas south of the north-temperate zone, often close to the equator, and are photoperiodically adapted to a long season. When grown in north-temperate climates maturation is much-delayed until late fall, or the plants succumb to cold weather before they are able to produce seeds. Unlike fiber strains that have been selected to grow well at extremely high densities, drug strains tend to be less persistent when grown in high concentration (de Meijer 1994). Drug strains can be very similar in appearance to fiber strains. However, a characteristic type of narcotic plant was selected in southern Asia, particularly in India and neighboring countries. This is dioecious, short (about a meter in height), highly branched, with large leaves (i.e. wide leaflets), and it is slow to mature. The appearance is rather like a short, conical Christmas tree.

Until recent times, the cultivation of hemp primarily as an oilseed was largely unknown, except in Russia. Today, it is difficult to reconstruct the type of plant that was grown there as an oilseed, because such cultivation has essentially been abandoned. Oilseed hemp cultivars in the modern sense were not available until very recently, but some land races certainly were grown specifically for seeds in Russia. Dewey (1914) gave the following information: “The short oil-seed hemp with slender stems, about 30 inches high, bearing compact clusters of seeds and maturing in 60 to 90 days, is of little value for fiber production, but the experimental plants, grown from seed imported from Russia, indicate that it may be valuable as an oil-seed crop to be harvested and threshed in the same manner as oil-seed flax.” Most hemp oilseed in Europe is currently obtained from so-called “dual usage” plants (employed for harvest of both stem fiber and seeds, from the same plants). Of the European dual-usage cultivars, ‘Uniko B’ and ‘Fasamo’ are particularly suited to being grown as oilseeds. Very recently, cultivars have been bred specifically for oilseed production. These include ‘Finola,’ formerly known as ‘Fin-314’ (Fig. 6) and ‘Anka’ (Fig. 7), which are relatively short, little-branched, mature early in north-temperate regions, and are ideal for high-density planting and harvest with conventional equipment. Dewey (1914) noted that a Turkish narcotic type of land race called “Smyrna” was commonly used in the early 20th century in the US to produce birdseed, because (like most narcotic types of *Cannabis*) it is densely branched, producing many flowers, hence seeds. While oilseed land races in northern Russia would have been short, early-maturing plants in view of the short growing season, in more southern areas oilseed landraces likely had moderate height, and were spaced more widely to allow abundant branching and seed production to develop. Until Canada replaced China in 1998 as a source of imported seeds for the US, most seeds used for various purposes in the US were sterilized and imported from China. Indeed, China remains the largest producer of hempseed. We have grown Chinese hemp land races, and these were short, branched, adapted to a very long growing season (i.e. they come into flower very slowly in response to photoperiodic induction of short days in the fall), and altogether they were rather reminiscent of Dewey's description of Smyrna. Although similar in appearance to narcotic strains of *C. sativa*, the Chinese land races we grew were in fact low in intoxicating constituents, and it may well be that what Dewey thought was a narcotic strain was not. Although some forms of *C. sativa* have quite large seeds, until recently oilseed forms appear to have been mainly selected for a heavy yield of seeds, usually recognizable by abundant branching. Such forms are typically grown at lower densities than hemp grown only for fiber, as this promotes branching, although it should be understood that the genetic propensity for branching has been selected. Percentage or quality of oil in the seeds does not appear to have been important in the past, although selection for these traits is now being conducted. Most significantly, modern selection is occurring with regard to mechanized harvesting, particularly the ability to grow in high density as single-headed stalks with very short branches bearing considerable seed.



Fig. 6. 'Finola,' the first cultivar of *Cannabis sativa* bred exclusively for grain. (Courtesy of the breeder, J.C. Callaway, Univ. Kuopio, Finland.)



Fig. 7. 'Anka,' the first registered North American bred cultivar of *Cannabis sativa*. This variety is best suited for grain production. (Courtesy of the breeder, P. Dragla, and of the Industrial Hemp Seed Development Company, Chatham, Ontario.)

CONTROLLING THE DRUG ABUSE POTENTIAL OF HEMP

As detailed below, the development of hemp as a new legal crop in North America must be considered in relation to illicit cultivation, so it is important to appreciate the scope of the drug situation. Up until the first half of the 20th century, drug preparations of *Cannabis* were used predominantly as a recreational inebriant in poor countries and the lower socio-economic classes of developed nations. After World War II, marijuana became associated with the rise of a hedonistic, psychedelic ethos, first in the United States and eventually over much of the world, with the consequent development of a huge international illicit market that exceeds the value of the hemp market during its heyday. Table 3 shows the “economic significance” (dollars generated in the black market plus dollar cost of control measures) of the illicit drug industry associated with *C. sativa*, and contrasts this with the estimated dollar value of legitimate uses. In the Netherlands, the annual value of narcotic hemp cultivation (ca. \$10 billion) exceeds the value of tulips (Collins 1999). Marijuana has become the most widely disseminated illicit species in the world (Schultes and Hofmann 1980). With the exception of alcohol, it is the most widely used recreational euphoric drug. About 25% of North Americans are believed to have used *Cannabis* illegally. According to the US National Institute on Drug Abuse (www.nida.nih.gov/Infofax/marijuana.html), more than 72 million Americans (33%) 12 years of age and older have tried marijuana. Cultivation, commerce, and consumption of drug preparations of *Cannabis* have been proscribed in most countries during the present century. The cost of enforcing the laws against *Cannabis* in North America is in the billions of dollars annually. In addition, there are substantial social costs, such as adverse effects on users, particularly those who are convicted. Tragically this includes some legitimate farmers who, faced with financial ruin because of the unprofitability of crops being grown, converted to growing marijuana.

Table 3. Comparative annual world economic significance of categories of *Cannabis* activity.

Category	World (\$)	North America (\$)	Type of investment
Recreational drugs	> 1 trillion	100s of billions	Law enforcement, eradication, education
Industrial hemp	100s of millions ^z	10s of millions	Production, development, marketing, research
Therapeutic drugs	100s of millions	10s of millions	Production, development, marketing, research
Phytoremediation	10s of thousands	nil	Research
Ornamental hemp	thousands	nil	Development

^z“The global market for hemp-derived products is valued at between \$100 million and \$200 million annually” (Pinfold Consulting 1998; De Guzman 2001).

A rather thorough analysis of the scope of the illicit marijuana industry in Canada for 1998 is reported at www.rcmp-grc.gc.ca/html/drugsituation.htm#Marihuana and summarized in MacLeod (1999). At least 800 tonnes (t) of marijuana were grown in Canada in 1998, representing a harvest of 4.7 million flowering plants. More than 50% of the marijuana available in Canada is grown domestically. An average mature plant was estimated to produce 170 g of “marketable substance.” The value of the Canadian crop is uncertain, but has been estimated to be in the billions of dollars annually (Heading 1998; MacLeod 1999).

The US Drug Enforcement Administration’s online criminal justice statistics for 2000 (cscmosaic.albany.edu/sourcebook/1995/pdf/t440.pdf) shows the following seizures and eradication of plants of *C. sativa*: 40,929 outdoor plots (2,597,796 plants), 139,580,728 ditchweed (ruderal plants), 2,361 indoor operations (217,105 plants), for a grand total of 2,814, 903 plants destroyed. Impressively, the species was grown in all 50 states (including outdoor seizures in every state except Wyoming)! It is of course impossible to know exactly how much marijuana is cultivated in the United States, and perhaps only 10% to 20% of the amount grown is seized. The profitability of the illegal crop is indicated by a comparison of the cost of a bushel of corn (roughly \$2.50) and a bushel of manicured marijuana (about \$70,000; it has been suggested that prices range from \$500 a pound, for low-quality marijuana, to more than \$5,000 a pound for “boutique” strains like “Northern Lights” and “Afghan Kush”). According to a National Organization for the Reform of Marijuana Laws (NORML) (mir.drugtext.org/marijuanane/marijuana_ranks_fourth_largest_c.htm) marijuana is at least the fourth most valuable crop in America, outranked only by corn, soybeans, and hay. It was estimated that 8.7 million marijuana plants were harvested in 1997, worth \$15.1 billion to growers and \$25.2 billion on the retail market (the wholesale value was used to compare marijuana to other cash crops). Marijuana was judged to be the largest revenue producing crop in Alabama, California, Colorado, Hawaii, Kentucky, Maine, Rhode Island, Tennessee, Virginia, and West Virginia, and one of the top five cash crops in 29 other states.

Cannabis contains a seemingly unique class of chemicals, the cannabinoids, of which more than 60 have been described, but only a few are psychoactive. Cannabinoids are produced in specialized epidermal glands, which differ notably in distribution on different organs of the plant (high concentrations occur on the upper surface of the young leaves and young twigs, on the tepals, stamens, and especially on the perigonal bract). Given this distribution, the glands would seem to be protective of young and reproductive above-ground tissues (the roots lack glands). Two classes of epidermal glands occur—stalked and sessile (Fig. 8), but in either case the glandular cells are covered by a sheath under which resin is accumulated, until the sheath ruptures, releasing resin on the surface. The resin is a sticky mixture of cannabinoids and a variety of terpenes. The characteristic odor of the plant is due to the abundant terpenes, which are not psychoactive. The more important cannabinoids are shown in Fig. 9. In the plant the cannabinoids exist predominantly in the form of carboxylic acids, which decarboxylate with time or when heated. Delta-9-tetrahydrocannabinol (Δ^9 -THC, or simply THC) is the predominant psychoactive component. Other THC isomers also occur, particularly Δ^8 -THC, which is also psychoactive. Technically, the euphoric psychological effects of THC are best described by the word psychotomimetic. Cannabidiol (CBD) is the chief non-psychotomimetic cannabinoid. A THC concentration in marijuana of approximately 0.9% has been suggested as a practical minimum level to achieve the (illegal) intoxicant effect, but CBD (the predominant cannabinoid of fiber and oilseed varieties) antagonizes (i.e. reduces) the effects of THC (Grotenhermen and Karus 1998). Concentrations of 0.3% to 0.9% are considered to have “only a small drug potential” (Grotenhermen and Karus 1998). Some cannabinoid races have been described, notably containing cannabichromene (particularly in high-THC forms) and cannabigerol monomethyl ether (in some Asian strains). The biosynthetic pathways of the cannabinoids are not yet satisfactorily elucidated, although the scheme shown in Fig. 10 is commonly accepted. At least in some strains, THC is derived from cannabigerol, while in others it may be derived from CBD. CBN and Δ^8 -THC are considered to be degradation products or analytical artifacts (Pate 1998a).

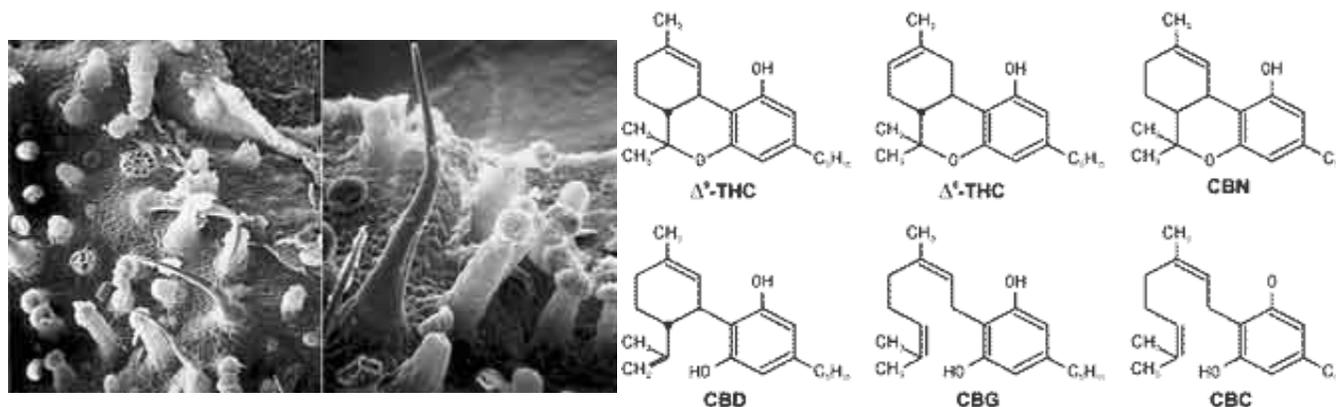


Fig. 8. Scanning electron micrographs of the abaxial surface of a perigonal bract (which envelops the fruit). These bracts are the most intoxicating part of the plant, and may contain 20% THC, dry weight. The resin is synthesized both in stalked and sessile glands. Multicellular secretory glands (of phallic appearance), some broken stalks of these (note cellular appearance), and unicellular cystolith hairs (claw-like structures) are pictured.

Fig. 9. Some important cannabinoids of cannabis resin. Δ^9 -THC (delta-9 tetrahydrocannabinol) is the chief intoxicant chemical and predominates in intoxicant strains, while the isomer Δ^8 -THC is usually present in no more than trace amounts. CBD (cannabidiol) is the chief non-intoxicant chemical, and predominates in non-intoxicant strains; it has sedative effects. The non-intoxicant CBN (cannabinol) is a frequent degradation or oxidation product. The non-intoxicant cannabichromene (CBC) is typically found in trace amounts in intoxicant strains. The non-intoxicant cannabigerol (CBG) is considered to be a precursor of the other cannabinoids (see Fig. 10).

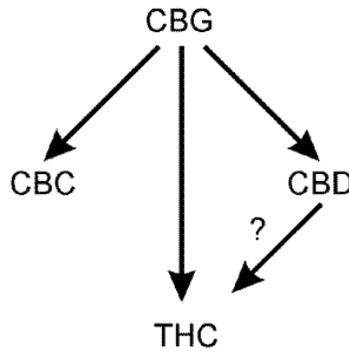


Fig. 10. Proposed biosynthetic pathways of the principal cannabinoids (after Pate 1998b).

Both in Canada and the US, the most critical problem to be addressed for commercial exploitation of *C. sativa* is the possible unauthorized drug use of the plant. Indeed, the reason hemp cultivation was made illegal in North America was concern that the hemp crop was a drug menace. The drug potential is, for practical purposes, measured by the presence of THC. THC is the world's most popular illicit chemical, and indeed the fourth most popular recreational drug, after caffeine, alcohol, and nicotine. "Industrial hemp" is a phrase that has become common to designate hemp used for commercial non-intoxicant purposes. Small and Cronquist (1976) split *C. sativa* into two subspecies: *C. sativa* subsp. *sativa*, with less than 0.3% (dry weight) of THC in the upper (reproductive) part of the plant, and *C. sativa* subsp. *indica* (Lam.) E. Small & Cronq. with more than 0.3% THC. This classification has since been adopted in the European Community, Canada, and parts of Australia as a dividing line between cultivars that can be legally cultivated under license and forms that are considered to have too high a drug potential. For a period, 0.3% was also the allowable THC content limit for cultivation of hemp in the Soviet Union. In the US, Drug Enforcement Agency guidelines issued Dec. 7, 1999 expressly allowed products with a THC content of less than 0.3% to enter the US without a license; but subsequently permissible levels have been a source of continuing contention. Marijuana in the illicit market typically has a THC content of 5% to 10% (levels as high as 25% have been reported), and as a point of interest, a current Canadian government experimental medicinal marijuana production contract calls for the production of 6% marijuana. As noted above, a level of about 1% THC is considered the threshold for marijuana to have intoxicating potential, so the 0.3% level is conservative, and some countries (e.g. parts of Australia, Switzerland) have permitted the cultivation of cultivars with higher levels. It should be appreciated that there is considerable variation in THC content in different parts of the plant. THC content increases in the following order: achenes (excluding bracts), roots, large stems, smaller stems, older and larger leaves, younger and smaller leaves, flowers, perigonal bracts covering both the female flowers and fruits. It is well known in the illicit trade how to screen off the more potent fractions of the plant in order to increase THC levels in resultant drug products. Nevertheless, a level of 0.3% THC in the flowering parts of the plant is reflective of material that is too low in intoxicant potential to actually be used practically for illicit production of marijuana or other types of cannabis drugs. Below, the problem of permissible levels of THC in food products made from hempseed is discussed.

There is a general inverse relationship in the resin of *Cannabis* between the amounts of THC present and the amount of the other principal cannabinoid, CBD. Whereas most drug strains contain primarily THC and little or no CBD, fiber and oilseed strains primarily contain CBD and very little THC. CBD can be converted to THC by acid catalyzed cyclization, and so could serve as a starting material for manufacturing THC. In theory, therefore, low-THC cultivars do not completely solve the problem of drug abuse potential. In practice, however, the illicit drug trade has access to easier methods of synthesizing THC or its analogues than by first extracting CBD from non-drug hemp strains.

Breeding for low THC cultivars in Europe has been reviewed by Bócsa (1998), Bócsa and Karus (1998), and Virovets (1996). Some researchers have claimed to have produced essentially THC-free strains, although at present no commercial cultivar seems to be 100% free of THC. THC content has proven to be more easily reduced in monoecious than in dioecious varieties. It should

be possible to select THC-free strains, and there has been speculation that genetic engineering could be helpful in this regard. As a strategic economic and political tactic, France has been attempting for several years to have the European Union (EU) adopt legislation forbidding the cultivation of industrial hemp cultivars with more than 0.1% THC, which would mean that primarily French varieties would have to be cultivated in Europe. However, the Canadian government has found that some French material has proven to be excessively high in THC.

There is certainly a need to utilize available germplasm sources in order to breed suitable cultivars for North America. A list of the 24 approved cultivars for the 2001 season in Canada is at www.hc-sc.gc.ca/hpb-dgps/therapeut/htmleng/hemp.html. Most of these are regulated by the European Organization of Economic Cooperation and Development (OECD). These cultivars are “approved” for use in Canada not on agricultural criteria, but merely on the basis that they meet the THC criterion. Indeed, most of these are unsuitable or only marginally suitable for Canada (Small and Marcus 2000), and only a very few Canadian cultivars to date have been created. In Canada, every acquisition of hemp grown at a particular place and time must be tested for THC content by an independent laboratory and, under the industrial hemp regulations, fields of hemp with more than 0.3% THC may require destruction (a slight degree of flexibility is generally exercised). Importation of experimental hemp lines (i.e. other than the approved cultivars) requires importation licenses (as well as phytosanitary clearance of the shipment by the Canadian Food Inspection Agency), and the importation licenses require an indication that the THC contents are low.

In Canada, the methodology used for analyses and sample collection for THC analysis of hemp plantings is standardized (at the Health Canada/Therapeutics Program/Hemp web site at www.hc-sc.gc.ca/hpb-dgps/therapeut/htmleng/hemp.html, see “Industrial Hemp Technical Manual” for procedures on sampling plant materials and chemical procedures for determining THC levels). The regulations require that one of the dozen independent laboratories licensed for the purpose conduct the analyses and report the results to Health Canada. Sample collection is also normally carried out by an independent authorized firm. The Canadian system of monitoring THC content has rigidly limited hemp cultivation to cultivars that consistently develop THC levels below 0.3%.

Because *C. sativa* has been a neglected crop for so long in North America, there are only negligible genetic resources available on this continent. Most germplasm stocks of hemp are in Europe, and the largest and most important collection is the Vavilov Institute gene bank in Leningrad. Figure 11 shows THC concentrations in the Vavilov collection, as well as in our own collection, largely of European germplasm. A disturbingly high percentage of the collections have THC levels higher than 0.3%, making it difficult to incorporate these into breeding programs.

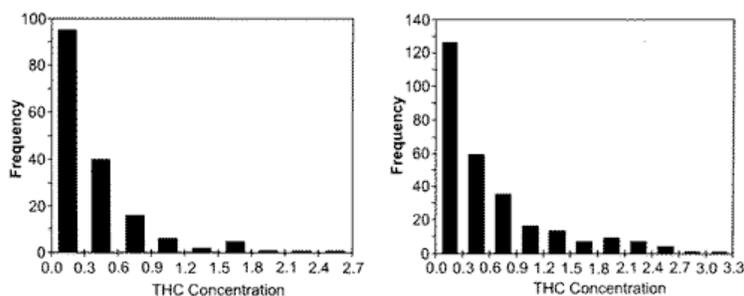


Fig. 11. Frequency histograms of THC concentration in germplasm collections. Left, collection of E. Small and D. Marcus; of the 167 accessions, 43% had THC levels >0.3%. Right, the collection of the Vavilov Institute, St. Petersburg; of the 278 accessions for which chemical analyses were reported in Anonymous (1975), about 55% had THC levels >0.3%.

Soil characteristics, latitude and climatic stresses have been found to have significant effects on THC concentrations, and there are seasonal and even diurnal variations (Small 1979; Pate 1998b). However, the range of THC concentrations developed by low-THC cultivars (those typically with $\leq 0.3\%$ THC) under different circumstances on the whole is limited, for the most part generally not varying more than 0.2 percentage points when grown in a range of circumstances, and usually less (note information in Scheifle et al. 1999; Scheifle 2000, Scheifle and Dragla 2000). Practically, this has meant in Canadian experience that a few cultivars have been eliminated from further commercial cultivation because they sometimes exceed the 0.3% level (‘Fedora 19’ and ‘Futura,’ authorized in 2000, have now been removed because some test results in several years exceeded 0.3%; ‘Finola’ and ‘Uniko B’ are under probation because of elevated levels), but on the whole most of the permitted cultivars have maintained highly consistent development of quite low levels of THC.

Hemp seeds contain virtually no THC, but THC contamination results from contact of the seeds with the resin secreted by the epidermal glands on the leaves and floral parts, and also by the failure to sift away all of the bracts (which have the highest concentration of THC of any parts of the plant) that cover the seeds. This results in small levels of THC appearing in hempseed oil and foods made with the seeds. Although most of the western hemp-growing world uses 0.3% THC as a maximum

concentration for authorized cultivation of hemp plants, regulations in various countries allow only a much lower level of THC in human food products manufactured from the seeds. Currently, up to 10 ppm THC is permitted in seeds and oil products used for food purposes in Canada. In Germany, more stringent limits were set for food in 2000: 5 ppm in food oil, 0.005 ppm in beverages, and 0.15 ppm in all other foods. The US Drug Enforcement Administration published new regulations on hemp in the Federal Register on October 9th 2001 that in effect 4 months later would ban the food use of hemp in the US because any amount of THC would be unacceptable in foods (follow links at www.hempreport.com/). These proposals are currently being challenged by the hemp industry. Limits have been set because of concerns about possible toxicity and interference with drug tests (Grotenhermen et al. 1998). An extensive analysis of literature dealing with the toxicity of hemp is in Orr and Starodub (1999; see Geiwitz 2001 for an analysis). Because hemp food products are considered to have great economic potential, there is considerable pressure on the hemp industry in North America to reduce THC levels.

The Drug Enforcement Agency and the Office of National Drug Control Policy of the US raised concerns over tests conducted from 1995 to 1997 that showed that consumption of hempseed products available during that period led to interference with drug-testing programs for marijuana use. Federal US programs utilize a THC metabolite level of 50 parts per billion in urine. Leson (2000) found that this level was not exceeded by consuming hemp products, provided that THC levels are maintained below 5 ppm in hemp oil, and below 2 ppm in hulled seeds. Nevertheless the presence of even minute trace amounts of THC in foods remains a tool that can be used by those wishing to prevent the hemp oilseed industry from developing.

FIBER USES

Based on world production of fibers in 1999, about 54.5% was synthetic (of which 60.3% was polyester), 42.9% was plant fiber (of which 78.5% was cotton), and 2.6% was wool (Karus 2000). In addition to cotton, flax is the only other significant plant fiber crop grown in temperate regions of the world (kenaf has received some enthusiastic backing in the southern US in recent years, but is most cheaply produced in India, Bangladesh, and China). Flax held 2.7% of the world plant fiber market in 1999, while hemp had only 0.3% (Karus 2000). Hemp fiber can potentially replace other biological fibers in many applications, but also, as noted below, can sometimes compete with minerals such as glass fiber and steel. As forests diminish, cultivation of annual plants as fiber sources is likely to increase. While crop residues like cereal straw will probably supply much of the need, specialty fiber plants such as hemp also have potential. The four conditions that will need to be met are (after Bolton 1995): (1) the material should be produced at a large enough scale; (2) the price should be low enough; (3) the fiber characteristics should be adequate for the end use; and (4) proven technology should be available for the processing of the new raw material. Of these criteria only point 3 is adequately met at this time for hemp in North America, but this is to be expected in a crop that has only begun to be cultivated after an absence of many years.

One of the reasons hemp fiber has been valued is because of its length. The primary bast fibers in the bark are 5–40 mm long, and are amalgamated in fiber bundles which can be 1–5 m long (secondary bast fibers are about 2 mm long). The woody core fibers are short—about 0.55 mm—and like hardwood fibers are cemented together with considerable lignin. The core fibers are generally considered too short for high grade paper applications (a length of 3 mm is considered ideal), and too much lignin is present. While the long bast fibers have been used to make paper almost for 2 millennia, the woody core fibers have rarely been so used. Nevertheless it has been suggested that the core fibers could be used for paper making, providing appropriate technology was developed (de Groot et al. 1998). In any event, the core fibers, have found a variety of uses, as detailed below. The long, lignin-poor bast fibers also have considerable potential to be used in many non-paper, non-textile applications, as noted below.

Selection for fiber has resulted in strains that have much more bark fiber tissues and much less woody core than encountered in narcotic strains, oilseed strains, and wild plants (Fig. 12). In non-fiber strains of *Cannabis*, bark can be less than one quarter of the stem tissues (i.e. more than three quarters can be woody core). By contrast, in fiber strains half of the stem tissues can be bark, and more than half of this can be the desirable long primary fibers (de Meijer 1995). Non-fiber strains rarely have as much as 15% fiber in the bark.



Fig. 12. Cross sections of stems at internodes of a fiber plant (left) and of a narcotic plant (right). Fiber cultivars have stems that are more hollow at the internodes, i.e. less wood, since this allows more energy to be directed into the production of bark fiber.

Other desirable features of hemp fibers are strength and durability (particularly resistance to decay), which made hemp useful in the past for rope, nets, sail-cloth, and oakum for caulking. During the age of sailing ships, *Cannabis* was considered to provide the very best of canvas, and indeed this word is derived from *Cannabis*. Several factors combined to decrease the popularity of hemp in the late 19th and early 20th centuries. Increasing limitation of cheap labor for traditional production in Europe and the New World led to the creation of some mechanical inventions, but too late to counter growing interest in competitive crops. Development of other natural fibers as well as synthetic fibers increased competition for hemp's uses as a textile fiber and for cordage. Hemp rag had been much used for paper, but the 19th century introduction of the chemical woodpulping process considerably lowered demand for hemp. The demise of the sail diminished the market for canvas. Increasing use of the plant for drugs gave hemp a bad image. All this led to the discontinuation of hemp cultivation in the early and middle parts of the 20th century in much of the world where cheap labor was limited. In the 19th century softer fabrics took over the clothing market, and today, hemp constitutes only about 1% of the natural fiber market. At least some production of hemp for fiber still occurs in Russia, China, the Ukraine, Poland, Hungary, the countries of the former Yugoslavia, Romania, Korea, Chile, and Peru. There has been renewed interest in England, Australia, and South Africa in cultivating fiber hemp. Italy has an outstanding reputation for high-quality hemp, but productivity has waned for the last several decades. In France, a market for high-quality paper, ironically largely cigarette paper, has developed (such paper is completely free of the intoxicating resin). Modern plant breeding in Europe has produced several dozen hemp strains, although by comparison with other fiber crops there are relatively few described varieties of hemp. Since World War II, breeding has been concerned most particularly with the development of monoecious varieties. Gehl (1995) reviewed fiber hemp development in Canada in the early 20th century, and concluded that the prospects for a traditional fiber industry were poor. However, as outlined below, there are now many non-traditional usages for hemp fiber which require consideration. Hemp long fiber is one of the strongest and most durable of natural fibers, with high tensile strength, wet strength, and other characteristics that make it technically suited for various industrial products (Karus and Leson 1996).

From 1982 to 2002 the EU provided the equivalent of about 50 million dollars to develop new flax and hemp harvesting and fiber processing technologies (Karus et al. 2000). Because of the similarities of flax and hemp, the technologies developed for one usually are adaptable to the other. In addition, various European nations and private firms contributed to the development of hemp technologies. Accordingly, Europe is far more advanced in hemp development with respect to all fiber-based applications than other parts of the world. The EU currently dedicates about 30,000 ha to hemp production. France is the leading country in hemp cultivation in the EU, and 95% of the non-seed production is used for "specialty pulp" as described below. Harvesting and processing machinery for fiber hemp is highly advanced in Europe, and some has been imported into Canada. However, there is insufficient fiber processing capacity to handle hemp produced in Canada.

Textiles

Hemp is a bast fiber crop, i.e. the most desirable ("long") fibers are found in the phloem-associated tissues external to the pith, just under the "bark." The traditional and still major first step in fiber extraction is to ret ("rot") away the softer parts of the plant, by exposing the cut stems to microbial decay in the field ("dew retting," shown in Figs. 46 and 47) or submerged in water ("water retting," shown in Fig. 13). The result is to slough off the outer parts of the stem and to loosen the inner woody core (the "hurds") from the phloem fibers (Fig. 14). Water retting has been largely abandoned in countries where labor is expensive or environmental regulations exist. Water retting, typically by soaking the stalks in ditches, can lead to a high level of pollution. Most hemp fiber used in textiles today is water retted in China and Hungary. Retting in tanks rather than in open bodies of water is a way of controlling the effluents while taking advantage of the high-quality fiber that is produced. Unlike flax, hemp long fiber requires water retting for preparation of high-quality spinnable fibers for production of fine textiles. Improved microorganisms or enzymes could augment or replace traditional water retting. Steam explosion is another potential technology that has been experimentally applied to hemp (Garcia-Jaldon et al. 1998). Decorticated material (i.e. separated at least into crude

fiber) is the raw material, and this is subjected to steam under pressure and increased temperature which “explodes” (separates) the fibers so that one has a more refined (thinner) hemp fiber that currently is only available from water retting. Even when one has suitably separated long fiber, specialized harvesting, processing, spinning and weaving equipment are required for preparing fine hemp textiles. The refinement of equipment and new technologies are viewed as offering the possibility of making fine textile production practical in western Europe and North America, but at present China controls this market, and probably will remain dominant for the foreseeable future.



Fig. 13. Water retting of hemp in Yugoslavia. (Courtesy of Dr. J. Berenji, Institute of Field and Vegetable Crops, Novi Sad.)

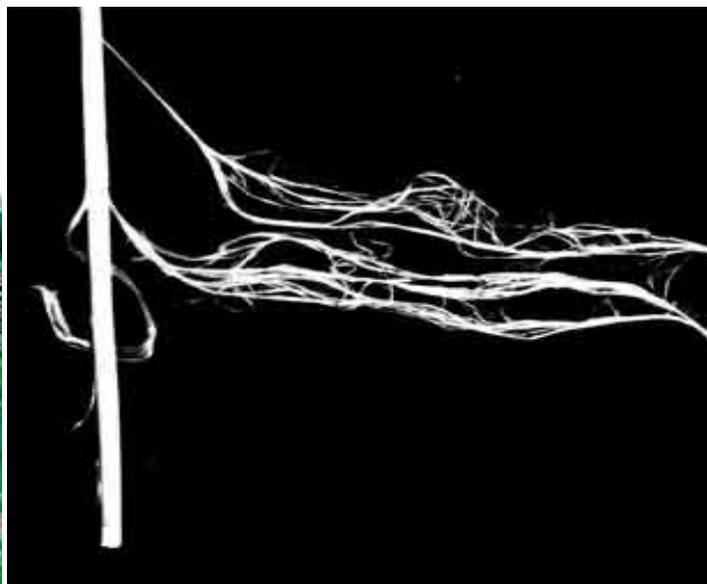


Fig. 14. Fiber in retted hemp stem. This stem was bent sharply after retting, breaking the woody central portion (hurds), leaving the bark fibers unbroken. The two portions of stem are separated in this photograph, and are joined by the tough bark fibers.

There are practical, if cruder alternatives to separate the long fiber for high-quality textile production, but in fact such techniques are used mostly for non-textile applications. This involves production of “whole fibers” (i.e. harvesting both the long fibers from the cortex and the shorter fibers from throughout the stem), and technologies that utilize shortened hemp fibers. This approach is currently dominant in western Europe and Canada, and commences with field dew retting (typically 2–3 weeks). A principal limitation is climatic—the local environment should be suitably but not excessively moist at the close of the harvest season. Once stalks are retted, dried, and baled, they are processed to extract the fiber. In traditional hemp processing, the long fiber was separated from the internal woody hurds in two steps, breaking (stalks were crushed under rollers that broke the woody core into short pieces, some of which were separated) and scutching (the remaining hurds, short fibers (“tow”) and long fibers (“line fiber,” “long-line fiber”) were separated). A single, relatively expensive machine called a decorticator can do these two steps as one. In general in the EU and Canada, fibers are not separated into tow and line fibers, but are left as “whole fiber.” In western Europe, the fiber is often “cottonized,” i.e. chopped into short segments the size of cotton and flax fiber, so that the fibers can be processed on flax processing machinery, which is very much better developed than such machinery is for hemp. In North America the use of hemp for production of even crude textiles is marginal. Accordingly, the chief current fiber usages of North American, indeed of European hemp, are non-textile.

Although always sold at a premium price, hemp clothing has a natural appeal to a sector of the population. Hemp clothes are resistant to abrasion, but are typically abrasive. However, appropriate processing and blending with other natural fibers has significantly improved the “feel” of the product, and in China hemp textiles indistinguishable from fine linens in texture are available. Weaving of hemp fibers into textiles and apparel is primarily done in China, Hungary, Romania, Russia, and the Ukraine. Processing costs are higher for industrial hemp because the fibers vary from the standard specifications for fiber length and diameter established for the equipment used in most textile and apparel factories, necessitating the use of specialty machines. The North American hemp apparel industry today is based on fiber, yarn, and fabrics imported from Eastern Europe and China. The extraction technology and spinning facilities, to say nothing of much lower labor costs, make it very difficult for the potential development of a hemp textile industry in North America. The fact that spinning facilities for natural fibers are so concentrated in China is making it increasingly difficult to competitively produce hemp fabrics elsewhere. This of course lessens the value-added future of growing hemp for a potential textile industry in North America. It is possible, however, that new technologies could change this situation, and especially in the EU development is underway to establish a fledgling domestic hemp textile industry.

In addition to textiles used in clothing, coarser woven cloth (canvas) is used for upholstery, bags, sacks, and tarpaulins. There is very little effort in North America to produce such woven products, and non-woven material (Fig. 15) can be more easily produced. Hempline in Ontario, the first firm to grow hemp for commercial purposes in North America since the second world war (starting with experimental cultivation in 1994), is the exception, and is concerned with production of fiber for upholstery and carpeting.



Fig. 15. Multi-purpose matting, fabricated from hemp. (Courtesy of Kenex Ltd., Pain Court, Ontario.)

Pulp and Paper

Van Roekel (1994) has pointed out that Egyptian papyrus sheets are not “paper,” because the fiber strands are woven, not “wet-laid;” the oldest surviving paper is over 2,000 years of age, from China, and was made from hemp fiber (Fleming and Clarke 1998). Until the early 19th century, hemp, and flax were the chief paper-making materials. In historical times, hemp rag was processed into paper. Using hemp directly for paper was considered too expensive, and in any event the demand for paper was far more limited than today. Wood-based paper came into use when mechanical and chemical pulping was developed in the mid 1800s in Germany and England. Today, at least 95% of paper is made from wood pulp.

The pulp and paper industry based on wood has considered the use of hemp for pulp, but only on an experimental basis. Hemp’s long fibers could make paper more recyclable. Since virgin pulp is required for added strength in the recycling of paper, hemp pulp would allow for at least twice as many cycles as wood pulp. However, various analyses have concluded that the use of hemp for conventional paper pulp is not profitable (Fertig 1996).

“Specialty pulp” is the most important component of the hemp industry of the EU, and is expected to remain its core market for the foreseeable future. The most important specialty pulp products made from hemp are cigarette paper (Fig. 16), bank notes, technical filters, and hygiene products. Other uses include art papers and tea bags. Several of these applications take advantage of hemp’s high tear and wet strength. This is considered to be a highly stable, high-priced niche market in Europe, where hemp has an 87% market share of the “specialty pulp” sector (Karus et al. 2000). In Europe, decortication/refining machines are available that can produce 10 t/hour of hemp fiber suitable for such pulp use. North American capacity for hemp pulp production and value-added processing is much more limited than that of Europe, and this industry is negligible in North America.



Fig. 16. Hemp cigarette paper, the most profitable paper product currently manufactured from hemp.

Hemp paper is useful for specialty applications such as currency and cigarette papers where strength is needed. The bast fiber is of greatest interest to the pulp and paper industry because of its superior strength properties compared to wood. However, the short, bulky fibers found in the inner part of the plant (hurds) can also be used to make cheaper grades of paper, apparently without greatly affecting quality of the printing surface. Hemp is not competitive for newsprint, books, writing papers, and general paper (grocery bags, coffee cups, napkins), although there is a specialty or novelty market for those specifically wishing to support the hemp industry by purchasing hemp writing or printing paper despite the premium price (Fig. 17).



Fig. 17. Hemp paper products (writing paper, notebook, envelopes).

A chief argument that has been advanced in favor of developing hemp as a paper and pulp source has been that as a non-wood or tree-free fiber source, it can reduce harvesting of primary forests and the threat to associated biodiversity. It has been claimed that hemp produces three to four times as much useable fiber per hectare per annum as forests. However, Wong (1998) notes evidence that in the southern US hemp would produce only twice as much pulp as does a pine plantation (but see discussion below on suitability of hemp as a potential lumber substitute in areas lacking trees).

Hemp paper is high-priced for several reasons. Economies of scale are such that the supply of hemp is minute compared to the supply of wood fiber. Hemp processing requires non-wood-based processing facilities. Hemp paper is typically made only from bast fibers, which require separation from the hurds, thereby increasing costs. This represents less than 50% of the possible fiber yield of the plant, and future technologies that pulp the whole stalks could decrease costs substantially. Hemp is harvested once a year, so that it needs to be stored to feed mills throughout the year. Hemp stalks are very bulky, requiring much handling and storage. Transportation costs are also very much higher for hemp stalks than for wood chips. Waste straw is widely available from cereals and other crops, and although generally not nearly as desirable as hemp, can produce bulk pulp far more cheaply than can be made from hemp. In addition to agricultural wastes, there are vast quantities of scrub trees, especially poplar, in northern areas, that can supply large amounts of low-quality wood fiber extremely cheaply. Moreover, in northern areas fast-growing poplars and willows can be grown, and such agro-forestry can be very productive and environmentally benign. And, directly or indirectly, the lumber/paper industry receives subsidies and/or supports, which is most unlikely for hemp.

Plastic Composites for the Automobile and Other Manufacturing Sectors

With respect to fiber, a “composite” is often defined as a material consisting of 30%–70% fiber and 70%–30% matrix (Bolton 1995). However, in North America particleboards and fiberboards, which generally contain less than 10% adhesive or matrix, are sometimes referred to as composites. This section addresses plastic-type composites. In plastics, fibers are introduced to improve physical properties such as stiffness, impact resistance, bending and tensile strength. Man-made fibers of glass, kevlar and carbon are most commonly used today, but plant fibers offer considerable cost savings along with comparable strength properties.

Plastic composites for automobiles are the second most important component of the hemp industry of the EU. Natural fibers in automobile composites are used primarily in press-molded parts (Fig. 18). There are two widespread technologies. In thermoplastic production, natural fibers are blended with polypropylene fibers and formed into a mat, which is pressed under heat into the desired form. In thermoset production the natural fibers are soaked with binders such as epoxy resin or polyurethane, placed in the desired form, and allowed to harden through polymerization. Hemp has also been used in other types of thermoplastic applications, including injection molding. The characteristics of hemp fibers have proven to be superior for

production of molded composites. In European manufacturing of cars, natural fibers are used to reinforce door panels, passenger rear decks, trunk linings, and pillars. In 1999 over 20,000 t of natural fiber were used for these purposes in Europe, including about, 2,000 t of hemp. It has been estimated that 5–10 kg of natural fibers can be used in the molded portions of an average automobile (excluding upholstery). The demand for automobile applications of hemp is expected to increase considerably, depending on the development of new technologies (Karus et al. 2000).



Fig. 18. C-class Mercedes-Benz automobiles have more than 30 parts made of natural fibers, including hemp. (Courtesy of T. Schloesser, Daimler-Chrysler.)

Henry Ford recognized the utility of hemp in early times. In advance of today’s automobile manufacturers, he constructed a car with certain components made of resin stiffened with hemp fiber (Fig. 19). Rather ironically in view of today’s parallel situation, Henry Ford’s hemp innovations in the 1920s occurred at a time of crisis for American farms, later to intensify with the depression. The need to produce new industrial markets for farm products led to a broad movement for scientific research in agriculture that came to be labeled “Farm Chemurgy,” that today is embodied in chemical applications of crop constituents.



Fig. 19. Henry Ford swinging an axe at his 1941 car to demonstrate the toughness of the plastic trunk door made of soybean and hemp. (From the collections of Henry Ford Museum & Greenfield Village.)

There is also considerable potential for other industries using hemp in the manner that the automobile industry has demonstrated is feasible. Of course, all other types of transportation vehicles from bicycles to airplanes might make use of such technology. Natural fibers have considerable advantages for use in conveyance (Karus et al. 2000): low density and weight reduction, favorable mechanical, acoustical, and processing properties (including low wear on tools), no splintering in accidents, occupational health benefits (compared to glass fibers), no off-gassing of toxic compounds, and price advantages. Additional types of composite using hemp in combination with other natural fibers, post-industrial plastics or other types of resins, are being used to produce non-woven matting for padding, sound insulation, and other applications.

Building Construction Products

Thermal Insulation. Thermal insulation products (Fig. 20, 21) are the third most important sector of the hemp industry of the EU. These are in very high demand because of the alarmingly high costs of heating fuels, ecological concerns about conservation of non-renewable resources, and political-strategic concerns about dependence on current sources of oil. This is a market that is growing very fast, and hemp insulation products are increasing in popularity. In Europe, it has been predicted that tens of thousands of tonnes will be sold by 2005, shared between hemp and flax (Karus et al. 2000).



Fig. 20. Spun, loosely compacted hemp insulation. (Manufactured by La Chanvrière de l'Aube, France.)



Fig. 21. Loose Isochanvre® thermal insulation being placed between Périer, Chénovotte Habitat, France.)

Fiberboard. In North America the use of nonwood fibers in sheet fiberboard (“pressboard” or “composite board”) products is relatively undeveloped. Flax, jute, kenaf, hemp, and wheat straw can be used to make composite board. Wheat straw is the dominant nonwood fiber in such applications. Although it might seem that hemp bast fibers are desirable in composite wood products because of their length and strength, in fact the short fibers of the hurds have been found to produce a superior product (K. Domier, pers. commun.). Experimental production of hemp fiberboard has produced extremely strong material (Fig. 22). The economic viability of such remains to be tested. Molded fiberboard products are commercially viable in Europe (Fig. 23), but their potential in North America remains to be determined.



Fig. 22. Experimental fiberboard made with hemp. (Courtesy Dr. K. Domier, Univ. Alberta, Edmonton.)



Fig. 23. Molded fiberboard products. (Courtesy of HempFlax, Oude Pekela, The Netherlands).

Cement (Concrete) and Plaster. Utilizing the ancient technique of reinforcing clay with straw to produce reinforced bricks for constructing domiciles, plant fibers have found a number of comparable uses in modern times. Hemp fibers added to concrete increase tensile strength while reducing shrinkage and cracking. Whole houses have been made based on hemp fiber (Fig. 24, 25). In North America, such usage has only reached the level of a cottage industry. Fiber-reinforced cement boards and fiber-reinforced plaster are other occasionally produced experimental products. Hemp fibers are produced at much more cost than wood chips and straw from many other crops, so high-end applications requiring high strength seem most appropriate.



Fig. 24. New building in France being constructed entirely of hemp. Wall castings are a conglomerate of Isochanvre® lime-hemp, for production of a 200 mm thick monolithic wall without an interior wall lining. (Courtesy of M. Périer, Chènovotte Habitat, France.)



Fig. 25. The “hemp house” under construction on the Oglala Lakota Nation (Pine Ridge Reservation), South Dakota. Foundation blocks for the house are made with hemp fiber as a binder in cement. Stucco is also of hemp. Shingles are 60% hemp in a synthetic polymer. Hemp insulation is used throughout. (Courtesy of Oglala Sioux Tribe, Slim Butte Land Use Association, and S. Sausser.)

The above uses are based on hemp as a mechanical strengthener of materials. Hemp can also be chemically combined with materials. For example, hemp with gypsum and binding agents may produce light panels that might compete with drywall. Hemp and lime mixtures make a high quality plaster. Hemp hurds are rich in silica (which occurs naturally in sand and flint), and the hurds mixed with lime undergo mineralization, to produce a stone-like material. The technology is most advanced in France (Fig. 26). The mineralized material can be blown or poured into the cavities of walls and in attics as insulation. The foundations, walls, floors, and ceilings of houses have been made using hemp hurds mixed with natural lime and water. Sometimes plaster of Paris (pure gypsum), cement, or sand is added. The resulting material can be poured like concrete, but has a texture vaguely reminiscent of cork—much lighter than cement, and with better heat and sound-insulating properties. An experimental “ceramic tile” made of hemp has recently been produced (Fig. 27).



Fig. 26. Renovation of plaster walls of a traditional timber frame 16th century house (Mansion Raoul de la Faye, Paris) with Isochanvre® lime-hemp conglomerate. (Courtesy of M. Périer,



Fig. 27. Hemp “ceramic tile.” (Courtesy of Kenex Ltd., Pain Court, Ontario.)

Chènovotte Habitat, France.)

Animal Bedding

The woody core (hurds, sometimes called shives) of hemp makes remarkably good animal bedding (Fig. 28, 29). The hurds are sometimes molded into small pellets for bedding applications (Fig. 30). Such appears to be unsurpassed for horse bedding, and also make an excellent litter for cats and other pets (Fig. 31). The hurds can absorb up to five times their weight in moisture (typically 50% higher than wood shavings), do not produce dust (following initial dust removal), and are easily composted. Hemp bedding is especially suited to horses allergic to straw. In Europe, the animal bedding market is not considered important (Karus et al. 2000), but in North America there are insufficient hemp hurds available to meet market demand.



Fig. 28. Commercial warehouse of baled hemp animal bedding. (Courtesy of Kenex Ltd., Pain Court, Ontario.)



Fig. 29. Animal bedding made from hemp hurds.



Fig. 30. Pelleted hemp hurds. (Courtesy of La Chanvrière de l'Aube, Bar sur Aube,



Fig. 31. Songbirds on hemp litter. (Courtesy of La Chanvrière de l'Aube,

France.)

Bar sur Aube, France.)

The high absorbency of hemp hurds has led to their occasional use as an absorbent for oil and waste spill cleanup. Hemp as an industrial absorbent has generated some interest in Alberta, for use in land reclamation in the oil and gas industry. Because hemp hurds are a costly product, it is likely that animal bedding will remain the most important application.

Geotextiles

“Geotextiles” or “agricultural textiles” include (1) ground-retaining, biodegradable matting designed to prevent soil erosion, especially to stabilize new plantings while they develop root systems along steep highway banks to prevent soil slippage (Fig. 32); and (2) ground-covers designed to reduce weeds in planting beds (in the manner of plastic mulch). At present the main materials used are polymeric (polythene, spun-blown polypropylene) and some glass fiber and natural fibers. Both woven and non-woven fibers can be applied to geotextiles; woven and knitted materials are stronger and the open structure may be advantageous (e.g. in allowing plants to grow through), but non-wovens are cheaper and better at suppressing weeds. Flax and hemp fibers exposed to water and soil have been claimed to disintegrate rapidly over the course of a few months, which would make them unacceptable for products that need to have long-term stability when exposed to water and oil. Coco (coir) fiber has been said to be much more suitable, due to higher lignin content (40%–50%, compared to 2%–5% in bast fibers); these are much cheaper than flax and hemp fibers (Karus et al. 2000). However, this analysis does not do justice to the developing hemp geotextile market. Production of hemp erosion control mats is continuing in both Europe and Canada. Given the reputation for rot resistance of hemp canvas and rope, it seems probable that ground matting is a legitimate use. Moreover, the ability to last outdoors for many years is frequently undesirable in geotextiles. For example, the widespread current use of plastic netting to reinforce grass sod is quite objectionable, the plastic persisting for many years and interfering with lawn care. Related to geotextile applications is the possibility of using hemp fiber as a planting substrate (biodegradable pots and blocks for plants), and as biodegradable twine to replace plastic ties used to attach plants to supporting poles. Still another consideration is the “green ideal” of producing locally for local needs; by this credo, hemp is preferable in temperate regions to the use of tropical fibers, which need to be imported.



Fig. 32. Hemp-based erosion control blanket. Top left: Close-up of 100% hemp fiber blanket. Top right: Grass growing through blanket. Bottom: Demonstration of installation of blanket, near La Rivière, Manitoba. (Courtesy of Mark Myrowich, ErosionControlBlanket.com)

OILSEED USES

The cultivation of hemp in the EU is heavily weighted toward fiber production over oilseed production. In 1999, the EU produced about 27,000 t of hemp fiber, but only about 6,200 t of hemp seeds, mostly in France, and 90% of this was used as animal feed (Karus et al. 2000). The seeds (Fig. 33) have traditionally been employed as bird and poultry feed, but feeding the entire seeds to livestock has been considered to be a poor investment because of the high cost involved (although subsidization in

Europe allows such usage, especially in France where hemp seeds are not legally permitted in human food). As pointed out later, higher yield and better harvesting practices may make whole hempseed an economical livestock feed. Moreover, seed cake left after expressing the oil is an excellent feed. Efforts are underway in Europe to add value in the form of processed products for hemp, especially cosmetics and food but, as noted below, the North American market is already quite advanced in oilseed applications.



Fig. 33. “Seeds” (achenes) of hemp, with a match for scale.

In the EU and Canada, hemp has often been grown as a dual-purpose crop, i.e. for both fiber and oilseed. In France, dual purpose hemp is typically harvested twice—initially the upper seed-bearing part of the stems is cut and threshed with a combine, and subsequently the remaining stems are harvested. Growing hemp to the stage that mature seeds are present compromises the quality of the fiber, because of lignification. As well, the hurds become more difficult to separate. The lower quality fiber, however, is quite utilizable for pulp and non-woven usages.

In North America, oilseed hemp has several advantages over fiber hemp. Hemp seed and oil can fetch higher prices than hemp fiber. Hemp seed can be processed using existing equipment, while processing of hemp fiber usually requires new facilities and equipment.

Canada is specialized on oilseed production and processing, so that hemp oil and grain are much more suitable than fiber. Because of the extensive development of oilseeds in Canada, there is extensive capacity to produce high-quality cold-pressed hemp oil. Canada in the last 5 years has made great advances in the growing, harvesting, and processing of hempseed, and indeed has moved ahead of the EU in the development of raw materials and products for the natural foods, nutraceuticals, and cosmetics industries. In the EU, a yield of 1 t/ha is considered good. In Canada, extraordinary yields of 1.5 t/ha have been realized, at least locally, although in the initial years of hempseed development in Canada yields were often less than 500 kg/ha. In 1999, the year of largest Canadian hemp acreage, yields averaged 900 kg/ha. (Ideally, hemp seed yield should be based on air dry weight—with about 12% moisture. Hemp yields are sometime uncertain, and could be exaggerated by as much as 50% when moist weights are reported.)

Canadian experience with growing hemp commercially for the last 4 years has convinced many growers that it is better to use a single-purpose cultivar, seed or fiber, than a dual-purpose cultivar. The recent focus of Canadian hemp breeders has been to develop cultivars with high seed yields, low stature (to avoid channeling the plants’ energy into stalk, as is the case in fiber cultivars), early maturation (for the short growing seasons of Canada), and desirable fatty acid spectrum (especially gamma-linolenic acid).

Food

Dehulled (i.e. hulled) hemp seed is a very recent phenomenon, first produced in quantity in Europe. Hemp seeds have been used as food since ancient times, but generally the whole seed, including the hull, was eaten. Hemp seed was a grain used in ancient China, although there has been only minor direct use of hemp seed as food by humans. In the past, hemp seed has generally been a food of the lower classes, or a famine food. Peanut-butter type preparations have been produced from hemp seed in Europe for centuries, but were rather gritty since technology for removing the hulls was rudimentary. Modern seed dehulling using mechanical separation produces a smooth, white, gritless hemp seed meal that needs no additional treatment before it is consumed. It is important to understand, therefore, that the quality of modern hemp seed for human consumption far exceeds anything produced historically. This seed meal should be distinguished from the protein-rich, oil-poor seed cake remaining after oil has been expressed, that is used for livestock feed. The seed cake is also referred to as “seed meal,” and has proven to be excellent for animals (Mustafa et al. 1999).

Hemp seeds have an attractive nutty taste, and are now incorporated into many food preparations (Fig. 34), often mimicking familiar foods. Those sold in North America include nutritional (granola-type) or snack bars, “nut butters” and other spreads, bread, pretzels, cookies, yogurts, pancakes, porridge, fruit crumble, frozen dessert (“ice cream”), pasta, burgers, pizza, salt substitute, salad dressings, mayonnaise, “cheese,” and beverages (“milk,” “lemonade,” “beer,” “wine,” “coffee nog”). Hemp seed is often found canned or vacuum-packed (Fig. 35). Alcoholic beverages made with hemp utilize hempseed as a flavorant. Hemp food products currently have a niche market, based particularly on natural food and specialty food outlets.



Fig. 34. Some North American food products made with hemp seed and/or hemp seed oil.



Fig. 35. Canned hulled hemp seed. (Courtesy of Kenex Ltd., Pain Court, Ontario.)

Edible Oil

The use of *Cannabis* for seed oil (Fig. 36) began at least 3 millennia ago. Hempseed oil is a drying oil, formerly used in paints and varnishes and in the manufacture of soap. Present cultivation of oilseed hemp is not competitive with linseed for production of oil for manufacturing, or to sunflower and canola for edible vegetable oil. However, as noted below, there are remarkable dietary advantages to hempseed oil, which accordingly has good potential for penetrating the salad oil market, and for use in a very wide variety of food products. There is also good potential for hemp oil in cosmetics and skin-care products.



Fig. 36. Hemp oil. (Courtesy of La Chanvrière de l’Aube, Bar sur Aube, France.)

Foreign sources, China in particular, can produce hemp seed cheaply, but imported seed must be sterilized, and the delays this usually requires are detrimental. Seed that has been sterilized tends to go rancid quickly, and so it is imperative that fresh seed be available, a great advantage for domestic production. An additional extremely significant advantage that domestic producers have over foreign sources is organic production, which is important for the image desired by the hemp food market. Organic

certification is much more reliable in North America than in the foreign countries that offer cheap seeds. Whereas China used to supply most of the hempseed used for food in North America, Canadian-grown seeds have taken over this market.

About half of the world market for hemp oil is currently used for food and food supplements (de Guzman 2001). For edible purposes, hempseed oil is extracted by cold pressing. Quality is improved by using only the first pressing, and minimizing the number of green seeds present. The oil varies in color from off-yellow to dark green. The taste is pleasantly nutty, sometimes with a touch of bitterness. Hemp oil is high in unsaturated fatty acids (of the order of 75%), which can easily oxidize, so it is unsuitable for frying or baking. The high degree of unsaturation is responsible for the extreme sensitivity to oxidative rancidity. The oil has a relatively short shelf life. It should be extracted under nitrogen (to prevent oxidation), protected from light by being kept in dark bottles, and from heat by refrigeration. Addition of anti-oxidants prolongs the longevity of the oil. Steam sterilization of the seeds, often required by law, allows air to penetrate and so stimulates rancidity. Accordingly, sterilized or roasted hemp seeds, and products made from hemp seed that have been subjected to cooking, should be fresh. The value of hemp oil from the point of view of the primary components is discussed below. In addition, it has been suggested that other components, including trace amounts of terpenes and cannabinoids, could have health benefits (Leizer et al. 2000). According to an ancient legend (Abel 1980), Buddha, the founder of Buddhism, survived a 6-year interval of asceticism by eating nothing but one hemp seed daily. This apocryphal story holds a germ of truth—hemp seed is astonishingly nutritional.

Fatty Acids. The quality of an oil or fat is most importantly determined by its fatty acid composition. Hemp is of high nutritional quality because it contains high amounts of unsaturated fatty acids, mostly oleic acid (C18:1, 10%–16%), linoleic acid (C18:2, 50%–60%), alpha-linolenic acid (C18:3, 20%–25%), and gamma-linolenic acid (C18:3, 2%–5%) (Fig. 37). Linoleic acid and alpha-linolenic acid are the only two fatty acids that must be ingested and are considered essential to human health (Callaway 1998). In contrast to shorter-chain and more saturated fatty acids, these essential fatty acids do not serve as energy sources, but as raw materials for cell structure and as precursors for biosynthesis for many of the body's regulatory biochemicals. The essential fatty acids are available in other oils, particularly fish and flaxseed, but these tend to have unpleasant flavors compared to the mellow, slightly nutty flavor of hempseed oil. While the value of unsaturated fats is generally appreciated, it is much less well known that the North American diet is serious nutritionally unbalanced by an excess of linoleic over alpha-linolenic acid. In hempseed, linoleic and alpha-linolenic occur in a ratio of about 3:1, considered optimal in healthy human adipose tissue, and apparently unique among common plant oils (Deferme and Pate 1996). Gamma-linolenic acid or GLA is another significant component of hemp oil (1%–6%, depending on cultivar). GLA is a widely consumed supplement known to affect vital metabolic roles in humans, ranging from control of inflammation and vascular tone to initiation of contractions during childbirth. GLA has been found to alleviate psoriasis, atopic eczema, and mastalgia, and may also benefit cardiovascular, psychiatric, and immunological disorders. Ageing and pathology (diabetes, hypertension, etc.) may impair GLA metabolism, making supplementation desirable. As much as 15% of the human population may benefit from addition of GLA to their diet. At present, GLA is available in health food shops and pharmacies primarily as soft gelatin capsules of borage or evening primrose oil, but hemp is almost certainly a much more economic source. Although the content of GLA in the seeds is lower, hemp is far easier to cultivate and higher-yielding. It is important to note that hemp is the only current natural food source of GLA, i.e. not requiring the consumption of extracted dietary supplements. There are other fatty acids in small concentrations in hemp seed that have some dietary significance, including stearidonic acid (Callaway et al. 1996) and eicosenoic acid (Mölleken and Theimer 1997). Because of the extremely desirable fatty acid constitution of hemp oil, it is now being marketed as a dietary supplement in capsule form (Fig. 38).

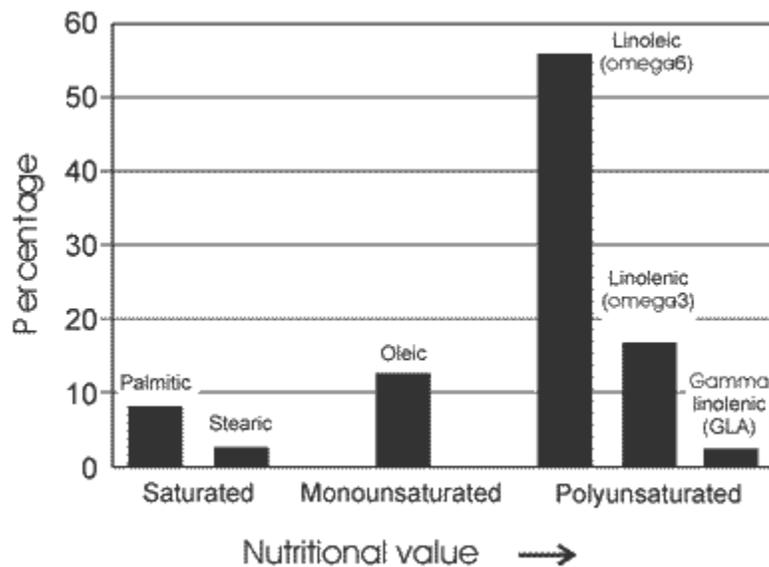


Fig. 37. Content of principal fatty acids in hempseed oil, based on means of 62 accessions grown in southern Ontario (reported in Small and Marcus 2000).



Fig. 38. Hemp oil in capsule form sold as a dietary supplement.

Tocopherols. Tocopherols are major antioxidants in human serum. Alpha- beta-, gamma- and delta-tocopherol represent the vitamin E group. These fat-soluble vitamins are essential for human nutrition, especially the alpha-form, which is commonly called vitamin E. About 80% of the tocopherols of hempseed oil is the alpha form. The vitamin E content of hempseed is comparatively high. Antioxidants in hempseed oil are believed to stabilize the highly polyunsaturated oil, tending to keep it from going rancid. Sterols in the seeds probably serve the same function, and like the tocopherols are also desirable from a human health viewpoint.

Protein. Hemp seeds contain 25%–30% protein, with a reasonably complete amino acid spectrum. About two thirds of hempseed protein is edestin. All eight amino acids essential in the human diet are present, as well as others. Although the protein content is smaller than that of soybean, it is much higher than in grains like wheat, rye, maize, oat, and barley. As noted above, the oilcake remaining after oil is expressed from the seeds is a very nutritious feed supplement for livestock, but it can also be used for production of a high-protein flour.

Personal Care Products

In the 1990s, European firms introduced lines of hemp oil-based personal care products, including soaps, shampoos, bubble baths, and perfumes. Hemp oil is now marketed throughout the world in a range of body care products, including creams, lotions, moisturizers, and lip balms. In Germany, a laundry detergent manufactured entirely from hemp oil has been marketed. Hemp-based cosmetics and personal care products account for about half of the world market for hemp oil (de Guzman 2001).

One of the most significant developments for the North American hemp industry was investment in hemp products by Anita and Gordon Roddick, founders of The Body Shop, a well known international chain of hair and body care retailers. This was a rather courageous and principled move that required overcoming American legal obstacles related to THC content. The Body Shop now markets an impressive array of hemp nutraceutical cosmetics (Fig. 39), and this has given the industry considerable credibility. The Body Shop has reported gross sales of about a billion dollars annually, and that about 4% of sales in 2000 were hemp products.



Fig. 39. Body care products offered by the Body Shop. (“Chanvre” is French for hemp.)

Industrial Fluids

The vegetable oils have been classified by “iodine value” as drying (120–200), semi-drying (100–120), and non-drying (80–100), which is determined by the degree of saturation of the fatty acids present (Raie et al. 1995). Good coating materials prepared from vegetable oil depend on the nature and number of double bonds present in the fatty acids. Linseed oil, a drying oil, has a very high percentage of linolenic acid. Hempseed oil has been classified as a semi-drying oil, like soybean oil, and is therefore more suited to edible than industrial oil purposes. Nevertheless hemp oil has found applications in the past in paints, varnishes, sealants, lubricants for machinery, and printing inks. However, such industrial end uses are not presently feasible as the oil is considered too expensive (de Guzman 2001). Larger production volumes and lower prices may be possible, in which case hemp oil may find industrial uses similar to those of linseed (flax), soybean, and sunflower oils, which are presently used in paints, inks, solvents, binders, and in polymer plastics. Hemp shows a remarkable range of variation in oil constituents, and selection for oilseed cultivars with high content of valued industrial constituents is in progress.

MEDICINAL MARIJUANA

Marijuana has in fact been grown for medicinal research in North America by both the Canadian (Fig. 40) and American governments, and this will likely continue. The possibility of marijuana becoming a legal commercial crop in North America is, to say the least, unlikely in the foreseeable future. Nevertheless the private sector is currently producing medicinal marijuana in Europe and Canada, so the following orientation to marijuana as a potential authorized crop is not merely academic.



Fig. 40. A truckload of Canadian medicinal marijuana from a plantation in Ottawa in 1971. More than a ton of marijuana was prepared for experimental research (described in Small et al. 1975).

The objectivity of scientific evaluation of the medicinal value of marijuana to date has been questioned. In the words of Hirst et al. (1998): “*The ...status of cannabis has made modern clinical research almost impossible. This is primarily because of the legal, ethical and bureaucratic difficulties in conducting trials with patients. Additionally, the general attitude towards cannabis, in which it is seen only as a drug of abuse and addiction, has not helped.*” In a recent editorial, the respected journal Nature (2001) stated: “*Governments, including the US federal government, have until recently refused to sanction the medical use of marijuana, and have also done what they can to prevent its clinical testing. They have defended their inaction by claiming that either step would signal to the public a softening of the so-called ‘war on drugs.’ ... The pharmacology of cannabinoids is a valid field of scientific investigation. Pharmacologists have the tools and the methodologies to realize its considerable potential, provided the political climate permits them to do so.*” Given these current demands for research on medicinal marijuana, it will be necessary to produce crops of drug types of *C. sativa*.

Earliest reference to euphoric use of *C. sativa* appears to date to China of 5 millennia ago, but it was in India over the last millennium that drug consumption became more firmly entrenched than anywhere else in the world. Not surprisingly, the most highly domesticated drug strains were selected in India. While *C. sativa* has been used as a euphoriant in India, the Near East, parts of Africa, and other Old World areas for thousands of years, such use simply did not develop in temperate countries where hemp was raised. The use of *C. sativa* as a recreational inebriant in sophisticated, largely urban settings is substantially a 20th century phenomenon.

Cannabis drug preparations have been employed medicinally in folk medicine since antiquity, and were extensively used in western medicine between the middle of the 19th century and World War II, particularly as a substitute for opiates (Mikuriya 1969). A bottle of commercial medicinal extract is shown in Fig. 41. Medical use declined with the introduction of synthetic analgesics and sedatives, and there is very limited authorized medical use today, but considerable unauthorized use, including so-called “compassion clubs” dispensing marijuana to gravely ill people, which has led to a momentous societal and scientific debate regarding the wisdom of employing cannabis drugs medicinally, given the illicit status. There is anecdotal evidence that cannabis drugs are useful for: alleviating nausea, vomiting, and anorexia following radiation therapy and chemotherapy; as an appetite stimulant for AIDS patients; for relieving the tremors of multiple sclerosis and epilepsy; and for pain relief, glaucoma, asthma, and other ailments [see Mechoulam and Hanus (1997) for an authoritative medical review, and Pate (1995) for a guide to the medical literature]. To date, governmental authorities in the US, on the advice of medical experts, have consistently rejected the authorization of medical use of marijuana except in a handful of cases. However, in the UK medicinal marijuana is presently being produced sufficient to supply thousands of patients, and Canada recently authorized the cultivation of medicinal marijuana for compassionate dispensation, as well as for a renewed effort at medical evaluation.



Fig. 41. Medicinal tincture of *Cannabis sativa*. (Not legal in North America.)

Several of the cannabinoids are reputed to have medicinal potential: THC for glaucoma, spasticity from spinal injury or multiple sclerosis, pain, inflammation, insomnia, and asthma; CBD for some psychological problems. The Netherlands firm HortaPharm developed strains of *Cannabis* rich in particular cannabinoids. The British firm G.W. Pharmaceuticals acquired proprietary access to these for medicinal purposes, and is developing medicinal marijuana. In the US, NIH (National Institute of Health) has a program of research into medicinal marijuana, and has supplied a handful of individuals for years with maintenance samples for medical usage. The American Drug Enforcement Administration is hostile to the medicinal use of *Cannabis*, and for decades research on medicinal properties of *Cannabis* in the US has been in an extremely inhospitable climate, except for projects and researchers concerned with curbing drug abuse. Synthetic preparations of THC—dronabinol (Marinol®) and nabilone (Cesamet®)—are permitted in some cases, but are expensive and widely considered to be less effective than simply smoking preparations of marijuana. Relatively little material needs to be cultivated for medicinal purposes (Small 1971), although security considerations considerably inflate costs. The potential as a “new crop” for medicinal cannabinoid uses is therefore limited. However, the added-value potential in the form of proprietary drug derivatives and drug-delivery systems is huge. The medicinal efficacy of *Cannabis* is extremely controversial, and regrettably is often confounded with the issue of balancing harm and liberty concerning the proscriptions against recreational use of marijuana. This paper is principally concerned with the industrial uses of *Cannabis*. In this context, the chief significance of medicinal *Cannabis* is that, like the issue of recreational use, it has made it very difficult to rationally consider the development of industrial hemp in North America for purposes that everyone should agree are not harmful.

Key analyses of the medicinal use of marijuana are: Le Dain (1972), Health Council of the Netherlands (1996), American Medical Association (1997), British Medical Association (1997), National Institutes of Health (1997), World Health Organization (1997), House of Lords (1998), and Joy et al. (1999).

MINOR USES

Biomass

It has been contended that hemp is notably superior to most crops in terms of biomass production, but van der Werf (1994b) noted that the annual dry matter yield of hemp (rarely approaching 20 t/ha) is not exceptional compared to maize, beet, or potato. Nevertheless, hemp has been rated on a variety of criteria as one of the best crops available to produce energy in Europe (Biewinga and van der Bijl 1996). Hemp, especially the hurds, can be burned as is or processed into charcoal, methanol, methane, or gasoline through pyrolysis (destructive distillation). As with maize, hemp can also be used to create ethanol. However, hemp for such biomass purposes is a doubtful venture in North America. Conversion of hemp biomass into fuel or alcohol is impractical on this continent, where there are abundant supplies of wood, and energy can be produced relatively cheaply from a variety of sources. Mallik et al. (1990) studied the possibility of using hemp for “biogas” (i.e. methane) production, and concluded that it was unsuitable for this purpose. Pinfold Consulting (1998) concluded that while there may be some potential for hemp biomass fuel near areas where hemp is cultivated, “a fuel ethanol industry is not expected to develop based on hemp.”

Essential Oil

Essential (volatile) oil in hemp is quite different from hempseed oil. Examples of commercial essential oil products are shown in Fig. 42. The essential oil is a mixture of volatile compounds, including monoterpenes, sesquiterpenes, and other terpenoid-like compounds that are manufactured in the same epidermal glands in which the resin of *Cannabis* is synthesized (Meier and Mediavilla 1998). Yields are very small—about 10 L/ha (Mediavilla and Steinemann 1997), so essential oil of *C. sativa* is expensive, and today is simply a novelty. Essential oil of different strains varies considerably in odor, and this may have economic importance in imparting a scent to cosmetics, shampoos, soaps, creams, oils, perfumes, and foodstuffs. Switzerland has been a center for the production of essential oil for the commercial market. Narcotic strains tend to be more attractive in odor than fiber strains, and because they produce much higher numbers of flowers than fiber strains, and the (female) floral parts provide most of the essential oil, narcotic strains are naturally adapted to essential oil production. Switzerland has permitted strains with higher THC content to be grown than is allowed in other parts of the world, giving the country an advantage with respect to the essential oil market. However, essential oil in the marketplace has often been produced from low-THC *Cannabis*, and the THC content of essential oil obtained by steam distillation can be quite low, producing a product satisfying the needs for very low THC levels in food and other commercial goods. The composition of extracted essential oil is quite different from the volatiles released around the fresh plant (particularly limonene and alpha-pinene), so that a pleasant odor of the living plant is not necessarily indicative of a pleasant-smelling essential oil. Essential oil has been produced in Canada by Gen-X Research Inc., Regina. The world market for hemp essential oil is very limited at present, and probably also has limited growth potential.



Fig. 42. Bottles of hemp fragrance (left) and essential oil (center), and pastilles flavored with hemp essential oil (right).

Pesticide and Repellent Potential

McPartland (1997) reviewed research on the pesticide and repellent applications of *Cannabis*. Dried plant parts and extracts of *Cannabis* have received rather extensive usage for these purposes in the past, raising the possibility that research could produce formulations of commercial value. This possibility is currently hypothetical.

Non-Seed Use of Hemp as Livestock Feed

As noted above, hemp seed cake makes an excellent feed for animals. However, feeding entire plants is another matter, because the leaves are covered with the resin-producing glands. While deer, groundhogs, rabbits, and other mammals will nibble on hemp plants, mammals generally do not choose to eat hemp. Jain and Arora (1988) fed narcotic *Cannabis* refuse to cattle, and found that the animals “suffered variable degrees of depression and revealed incoordination in movement.” By contrast, Letniak et al. (2000) conducted an experimental trial of hemp as silage. No significant differences were found between yield of the hemp and of barley/oat silage fed to heifers, suggesting that fermenting hemp plants reduces possible harmful constituents.

Hemp as an Agricultural Barrier

One of the most curious uses of hemp is as a fence to prevent pollen transfer in commercial production of seeds. Isolation distances for ensuring that seeds produced are pure are considerable for many plants, and often impractical. At one point in the 1980s, the only permitted use of hemp in Germany was as a fence or hedge to prevent plots of beets being used for seed production from being contaminated by pollen from ruderal beets. The high and rather impenetrable hedge that hemp can produce was considered unsurpassed by any other species for the purpose. As well, the sticky leaves of hemp were thought to trap pollen. However, Saeglitz et al. (2000) demonstrated that the spread of beet pollen is not effectively prevented by hemp hedges. Fiber (i.e. tall) cultivars of hemp were also once used in Europe as wind-breaks, protecting vulnerable crops against wind damage. Although hemp plants can lodge, on the whole very tall hemp is remarkably resistant against wind.

Bioremediation

Preliminary work in Germany (noted in Karus and Leson 1994) suggested that hemp could be grown on soils contaminated with heavy metals, while the fiber remained virtually free of the metals. Kozlowski et al. (1995) observed that hemp grew very well on copper-contaminated soil in Poland (although seeds absorbed high levels of copper). Baraniecki (1997) found similar results. Mölleken et al. (1997) studied effects of high concentration of salts of copper, chromium, and zinc on hemp, and demonstrated that some hemp cultivars have potential application to growth in contaminated soils. It would seem unwise to grow hemp as an oilseed on contaminated soils, but such a habitat might be suitable for a fiber or biomass crop. The possibility of using hemp for bioremediation deserves additional study.

Wildlife Uses

Hemp is plagued by bird predation, which take a heavy toll on seed production. The seeds are well known to provide extremely nutritious food for both wild birds and domestic fowl. Hunters and birdwatchers who discover wild patches of hemp often keep this information secret, knowing that the area will be a magnet for birds in the fall when seed maturation occurs. Increasingly in North America, plants are being established to provide habitat and food for wildlife. Hemp is not an aggressive weed, and certainly has great potential for being used as a wildlife plant. Of course, current conditions forbid such usage in North America.

Ornamental Forms

Hemp has at times in the past been grown simply for its ornamental value. The short, strongly-branched cultivar ‘Panorama’ (Fig. 43) bred by Iván Bósca, the dean of the world’s living hemp breeders, was commercialized in Hungary in the 1980s, and has been said to be the only ornamental hemp cultivar available. It has had limited success, of course, because there are very few

circumstances that permit private gardeners can grow *Cannabis* as an ornamental today. By contrast, beautiful ornamental cultivars of opium poppy are widely cultivated in home gardens across North America, despite their absolute illegality and the potentially draconian penalties that could be imposed. Doubtless in the unlikely event that it became possible, many would grow hemp as an ornamental.



Fig. 43. ‘Panorama,’ the world’s only ornamental cultivar, with the breeder, Ivan Bócsa. (Courtesy of Professor Bócsa.)

AGRONOMY

The following sketch of hemp cultivation is insufficient to address all of the practical problems that are encountered by hemp growers. Bócsa and Karus (1998) is the best overall presentation of hemp growing available in English. The reader is warned that this book, as well as almost all of the literature on hemp, is very much more concerned with fiber production than oilseed production. McPartland et al. (2000) is the best presentation available on diseases and pests, which fortunately under most circumstances do limited damage. The resource list presented below should be consulted by those wishing to learn about hemp production. Provincial agronomists in Canada now have experience with hemp, and can make local recommendations.

Particularly good web documents are: for Ontario (OMAFRA Hemp Series, several documents):

www.gov.on.ca/OMAFRA/english/crops/hort/hemp.html); for Manitoba (several documents):

www.gov.mb.ca/agriculture/crops/hemp/bko01s00.html); for British Columbia: (BC Ministry of Agriculture and Foods Fact Sheet on Industrial Hemp, prepared by A. Oliver and H. Joynt): www.agf.gov.bc.ca/croplive/plant/horticult/specialty/specialty.htm

In the US, extension publications produced up to the end of World War II are still useful, albeit outdated (Robinson 1935; Wilsie et al. 1942; Hackleman and Domingo 1943; Wilsie et al. 1944).

Hemp does best on a loose, well-aerated loam soil with high fertility and abundant organic matter. Well-drained clay soils can be used, but poorly-drained clay soils are very inappropriate because of their susceptibility to compaction, which is not tolerated. Young plants are sensitive to wet or flooded soils, so that hemp must have porous, friable, well-drained soils. Sandy soils will grow good hemp, provided that adequate irrigation and fertilization are provided, but doing so generally makes production uneconomical. Seedbed preparation requires considerable effort. Fall plowing is recommended, followed by careful preparation of a seedbed in the spring. The seedbed should be fine, level, and firm. Seed is best planted at 2–3 cm (twice as deep will be tolerated). Although the seedlings will germinate and survive at temperatures just above freezing, soil temperatures of 8°–10°C are preferable. Generally hemp should be planted after danger of hard freezes, and slightly before the planting date of maize. Good soil moisture is necessary for seed germination, and plenty of rainfall is needed for good growth, especially during the first 6 weeks. Seeding rate is specific to each variety, and this information should be sought from the supplier. Fiber strains are typically sown at a minimum rate of 250 seeds per m² (approximately 45 kg/ha), and up to three times this density is sometimes recommended. In western Europe, seeding rates range from 60–70 kg/ha for fiber cultivars. Recommendations for seeding rates for grain production vary widely, from 10–45 kg/ha. Densities for seed production for tall, European, dual-purpose cultivars are less than for short oilseed cultivars. Low plant densities, as commonly found in growing tall European cultivars for seed, may not suppress weed growth adequately, and under these circumstances resort to herbicides may pose a problem for those wishing to grow hempseed organically. Hemp requires about the same fertility as a high-yielding crop of wheat. Industrial hemp grows well in areas that corn produces high yields. Growing hemp may require addition of up to 110 kg/ha of nitrogen, and 40–90 kg/ha of potash. Hemp particularly requires good nitrogen fertilization, more so for seed production than fiber. Adding nitrogen when it is not necessary is deleterious to fiber production, so that knowledge of the fertility of soils being used is very important. Organic

matter is preferably over 3.5%, phosphorus should be medium to high (>40 ppm), potassium should be medium to high (>250 ppm), sulfur good (>5,000 ppm), and calcium not in excess (<6,000 ppm).

Finding cultivars suited to local conditions is a key to success. Hemp prefers warm growing conditions, and the best European fiber strains are photoperiodically adapted to flowering in southern Europe, which provides seasons of at least 4 months for fiber, and 5.5 months for seed production. Asian land races are similarly adapted to long seasons. In Canada, many of the available cultivars flower too late in the season for fiber production, and the same may be predicted for the northern US. Fiber production should also be governed by availability of moisture throughout the season, and the need for high humidity in the late summer and fall for retting, so that large areas of the interior and west of North America are not adapted to growing fiber hemp. The US Corn Belt has traditionally been considered to be best for fiber hemp. There are very few cultivars dedicated to oilseed production (such as 'Finola' and 'Anka') or that at least are known to produce good oilseed crops (such as 'Fasamo' and 'Uniko-B'). Oilseed production was a specialty of the USSR, and there is some likelihood that northern regions of North America may find short-season, short-stature oilseed cultivars ideal.

Although hemp can be successfully grown continuously for several years on the same land, rotation with other crops is desirable. A 3- or preferably 4-year rotation may involve cereals, clover or alfalfa for green manure, maize, and hemp. In Ontario it has been recommended that hemp not follow canola, edible beans, soybeans or sunflowers. However, according to Bócsa and Karus (1998), "*it matters little what crops are grown prior to hemp.*"

For a fiber crop, hemp is cut in the early flowering stage or while pollen is being shed, well before seeds are set. Tall European cultivars (greater than 2 m) have mostly been grown in Canada to date, and most of these are photoperiodically adapted to mature late in the season (often too late). Small crops have been harvested with sickle-bar mowers and hay swathers, but plugging of equipment is a constant problem. Hemp fibers tend to wrap around combine belts, bearings, indeed any moving part, and have resulted in large costs of combine repairs (estimated at \$10.00/ha). Slower operation of conventional combines has been recommended (0.6–2 ha/hour). Large crops may require European specialized equipment, but experience in North America with crops grown mainly for fiber is limited. The Dutch company HempFlax has developed or adapted several kinds of specialized harvesting equipment (Fig. 44, 45).



Fig. 44. A John Deere Kemper harvester, with circular drums that cut and chop hemp stalks, shown in operation in southern Ontario. (Courtesy of Kenex Ltd., Pain Court, Ontario.)



Fig. 45. A hemp harvester operated by HempFlax (Netherlands), with a wide mowing head capable of cutting 3 m long stems into 0.6 m pieces, at a capacity of 3 ha/hour. (Courtesy of HempFlax, Oude Pekela, The Netherlands.)

Retting is generally done in the field (Fig. 46, 47). This typically requires weeks. The windrows should be turned once or twice. If not turned, the stems close to the ground will remain green while the top ones are retted and turn brown. When the stalks have become sufficiently retted requires experience—the fibers should have turned golden or grayish in color, and should separate easily from the interior wood. Baling can be done with any kind of baler (Fig. 48). Stalks should have less than 15% moisture when baled, and should be allowed to dry to about 10% in storage. Bales must be stored indoors. Retted stalks are loosely held together, and for highest quality fiber applications need to be decorticated, scutched, hackled, and combed to remove the remaining pieces of stalks, broken fibers, and extraneous material. The equipment for this is rare in North America, and consequently use of domestically-produced fiber for high quality textile applications is extremely limited. However, as described above relatively crude fiber preparations also have applications.



Fig. 46. Windrowed fiber hemp in process of dew retting. Photograph taken in 1930 on the Central Experimental Farm, Ottawa, Canada.



Fig. 47. Shocked fiber hemp in process of dew retting. Photograph taken in 1931, near Ottawa, Canada. The shocks shed water like pup-tents, providing more even retting than windrows.



Fig. 48. Baled, retted hemp straw. (Courtesy of Kenex Ltd., Pain Court, Ontario.)

Harvesting tall varieties for grain is difficult. In France, the principal grower of dual-purpose varieties, the grain is taken off the field first, leaving most of the stalks for later harvest (Fig. 49). Putting tall whole plants through a conventional combine results in the straw winding around moving parts, and the fibers working into bearings, causing breakdown, fires, high maintenance, and frustration. Following the French example of raising the cutting blade to harvest the grain is advisable. Growing short varieties dedicated to grain production eliminates many of the above problems, and since the profitability of hemp straw is limited at present, seems preferable. Grain growers should be aware that flocks of voracious birds are a considerable source of damage to hempseed, particularly in small plantations.

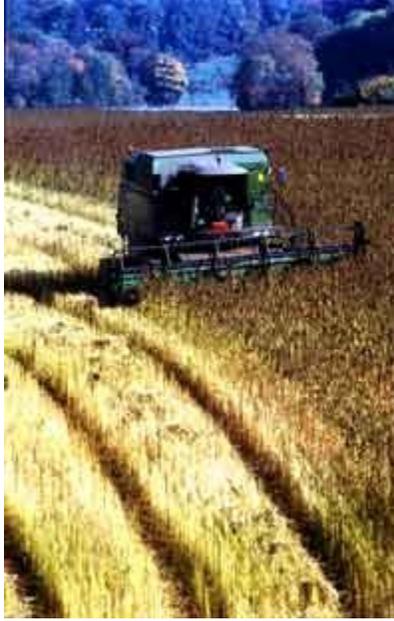


Fig. 49. Harvesting hemp in France. (Courtesy of La Chanvrière de l’Aube, Bar sur Aube, France.)

ECOLOGICAL FRIENDLINESS OF HEMP

Although the environmental and biodiversity benefits of growing hemp have been greatly exaggerated in the popular press, *C. sativa* is nevertheless exceptionally suitable for organic agriculture, and is remarkably less “ecotoxic” in comparison to most other crops (Montford and Small 1999b). Figure 50 presents a comparison of the ecological friendliness of *Cannabis* crops (fiber, oilseed, and narcotics) and 21 of the world’s major crops, based on 26 criteria used by Montford and Small (1999a) to compare the ecological friendliness of crops.

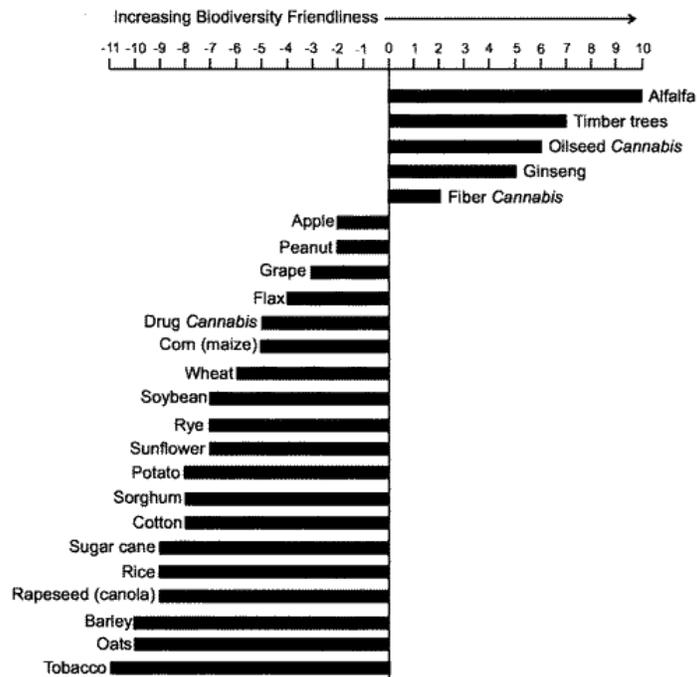


Fig. 50. A crude comparison of the biodiversity friendliness of selected major crops and three *Cannabis sativa* crops (fiber, oilseed, drug) based on 26 criteria (after Montford and Small 1999a).

The most widespread claim for environmental friendliness of hemp is that it has the potential to save trees that otherwise would be harvested for production of lumber and pulp. Earlier, the limitations of hemp as a pulp substitute were examined. With respect to wood products, several factors appear to favor increased use of wood substitutes, especially agricultural fibers such as hemp. Deforestation, particularly the destruction of old growth forests, and the world's decreasing supply of wild timber resources are today major ecological concerns. Agroforestry using tree species is one useful response, but nevertheless sacrifices wild lands and biodiversity, and is less preferable than sustainable wildland forestry. The use of agricultural residues (e.g. straw bales in house construction) is an especially environmentally friendly solution to sparing trees, but material limitations restrict use. Another chief advantage of several annual fiber crops over forestry crops is relative productivity, annual fiber crops sometimes producing of the order of four times as much per unit of land. Still another important advantage is the precise control over production quantities and schedule that is possible with annual crops. In many parts of the world, tree crops are simply not a viable alternative. "By the turn of the century 3 billion people may live in areas where wood is cut faster than it grows or where fuelwood is extremely scarce" (World Commission on Environment and Development 1987). "Since mid-century, lumber use has tripled, paper use has increased six-fold, and firewood use has soared as Third World populations have multiplied" (Brown et al. 1998). Insofar as hemp reduces the need to harvest trees for building materials or other products, its use as a wood substitute will tend to contribute to preserving biodiversity. Hemp may also enhance forestry management by responding to short-term fiber demand while trees reach their ideal maturation. In developing countries where fuelwood is becoming increasingly scarce and food security is a concern, the introduction of a dual-purpose crop such as hemp to meet food, shelter, and fuel needs may contribute significantly to preserving biodiversity.

The most valid claims to environmental friendliness of hemp are with respect to agricultural biocides (pesticides, fungicides, herbicides). *Cannabis sativa* is known to be exceptionally resistant to pests (Fig. 51), although, the degree of immunity to attacking organisms has been greatly exaggerated, with several insects and fungi specializing on hemp. Despite this, use of pesticides and fungicides on hemp is usually unnecessary, although introduction of hemp to regions should be expected to generate local problems. *Cannabis sativa* is also relatively resistant to weeds, and so usually requires relatively little herbicide. Fields intended for hemp use are still frequently normally cleared of weeds using herbicides, but so long as hemp is thickly seeded (as is always done when hemp is grown for fiber), the rapidly developing young plants normally shade out competing weeds.



Fig. 51. Grasshopper on hemp. Most insects cause only limited damage to hemp, and substantial insect damage is uncommon, so the use of insecticides is very rarely required.

BREEDING HEMP FOR NORTH AMERICA

The basic commercial options for growing hemp in North America is as a fiber plant, an oilseed crop, or for dual harvest for both seeds and fiber. Judged on experience in Canada to date, the industry is inclined to specialize on either fiber or grain, but not both. Hemp in our opinion is particularly suited to be developed as an oilseed crop in North America. The first and foremost breeding goal is to decrease the price of hempseed by creating more productive cultivars. While the breeding of hemp fiber cultivars has proceeded to the point that only slight improvements can be expected in productivity in the future, the genetic potential of hemp as an oilseed has scarcely been addressed. From the point of view of world markets, concentrating on oilseed

hemp makes sense, because Europe has shown only limited interest to date in developing oilseed hemp, whereas a tradition of concentrating on profitable oilseed products is already well established in the US and Canada. Further, China's supremacy in the production of high-quality hemp textiles at low prices will be very difficult to match, while domestic production of oilseeds can be carried out using technology that is already available. The present productivity of oilseed hemp—about 1 t/ha under good conditions, and occasional reports of 1.5 to 2 t/ha, is not yet sufficient for the crop to become competitive with North America's major oilseeds. We suggest that an average productivity of 2 t/ha will be necessary to transform hempseed into a major oilseed, and that this breeding goal is achievable. At present, losses of 30% of the seed yields are not uncommon, so that improvements in harvesting technology should also contribute to higher yields. Hemp food products cannot escape their niche market status until the price of hempseed rivals that of other oilseeds, particularly rapeseed, flax, and sunflower. Most hemp breeding that has been conducted to date has been for fiber characteristics, so that there should be considerable improvement possible. The second breeding goal is for larger seeds, as these are more easily shelled. Third is breeding for specific seed components. Notable are the health-promoting gamma-linolenic acid; improving the amino acid spectrum of the protein; and increasing the antioxidant level, which would not only have health benefits but could increase the shelf life of hemp oil and foods.

Germplasm Resources

Germplasm for the improvement of hemp is vital for the future of the industry in North America. However, there are no publicly available germplasm banks housing *C. sativa* in North America. The hundreds of seed collections acquired for Small's studies (reviewed in Small 1979) were destroyed in 1980 because Canadian government policy at that time envisioned no possibility that hemp would ever be developed as a legitimate crop. An inquiry regarding the 56 United States Department of Agriculture hemp germplasm collections supplied to and grown by Small and Beckstead (1973) resulted in the reply that there are no remaining hemp collections in USDA germplasm holdings, and indeed that were such to be found they would have to be destroyed. While hemp has been and still is cultivated in Asia and South America, it is basically in Europe that germplasm banks have made efforts to preserve hemp seeds. The Vavilov Institute of Plant Research in St. Petersburg, Russia has by far the largest germplasm collection of hemp of any public gene bank, with about 500 collections. Detailed information on the majority of hemp accessions of the Vavilov Institute can be found in Anon. (1975). Budgetary problems in Russia have endangered the survival of this invaluable collection, and every effort needs to be made to find new funding to preserve it. Maintenance and seed generation issues for the Vavilov hemp germplasm collection are discussed in a number of articles in the Journal of the International Hemp Association (Clarke 1998b; Lemeshev et al. 1993, 1994). The Gatersleben gene bank of Germany, the 2nd largest public gene bank in Europe, has a much smaller *Cannabis* collection, with less than 40 accessions (detailed information on the hemp accessions of the Gatersleben gene bank are available at fox-serv.ipk-gatersleben.de/). Because hemp is regaining its ancient status as an important crop, a number of private germplasm collections have been assembled for the breeding of cultivars as commercial ventures (de Meijer and van Soest 1992; de Meijer 1998), and of course these are available only on a restricted basis, if at all.

The most pressing need of the hemp industry in North America is for the breeding of more productive oilseed cultivars. At present, mainly European cultivars are available, of which very few are suitable for specialized oilseed production. More importantly, hempseed oil is not competitive, except in the novelty niche market, with the popular food oils. As argued above, to be competitive, hemp should produce approximately 2 t/ha; at present 1 t/ha is considered average to good production. Doubling the productive capacity of a conventional crop would normally be considered impossible, but it needs to be understood just how little hemp has been developed as an oilseed. There may not even be extant land races of the kind of hemp oilseed strains that were once grown in Russia, so that except for a very few very recent oilseed cultivars, there has been virtually no breeding of oilseed hemp. Contrarily, hemp has been selected for fiber to the point that some breeders consider its productivity in this respect has already been maximized. Fiber strains have been selected for low seed production, so that most hemp germplasm has certainly not been selected for oilseed characteristics. By contrast, drug varieties have been selected for very high yield of flowers, and accordingly produce very high yield of seeds. Drug varieties have been observed to produce more than a kilogram of seed per plant, so that a target yield of several tonnes per hectare is conceivable (Watson and Clarke 1997). Of course, the high THC in drug cultivars makes these a difficult source of germplasm. However, wild plants of *C. sativa* have naturally undergone selection for high seed productivity, and are a particularly important potential source of breeding germplasm.

Wild North American hemp is derived mostly from escaped European cultivated hemp imported in past centuries, perhaps especially from a revival of cultivation during World War II. Wild Canadian hemp is concentrated along the St. Lawrence and lower Great Lakes, where considerable cultivation occurred in the 1800s. In the US, wild hemp is best established in the American Midwest and Northeast, where hemp was grown historically in large amounts. Decades of eradication have exterminated many of the naturalized populations in North America. In the US, wild plants are rather contemptuously called "ditch weed" by law enforcement personnel. However, the attempts to destroy the wild populations are short-sighted, because they are a natural genetic reservoir, mostly low in THC. Wild North American plants have undergone many generations of natural adaptation to local conditions of climate, soil and pests, and accordingly it is safe to conclude that they harbor genes that are invaluable for the improvement of hemp cultivars. We have encountered exceptionally vigorous wild Canadian plants (Fig. 52), and grown wild plants from Europe (Fig. 53) which could prove valuable. Indeed, studies are in progress in Ontario to

evaluate the agronomic usefulness of wild North American hemp. Nevertheless, present policies in North America require the eradication of wild hemp wherever encountered. In Europe and Asia, there is little concern about wild hemp, which remains a valuable resource.



Fig. 52. Wild female hemp plant collected Oct. 17, 2000 near Ottawa, Canada. This vigorous plant had a fresh weight of 1.5 kg.



Fig. 53. A wild female hemp plant grown in southern Ontario [accession #16 from Georgia (formerly USSR), reported in Small and Marcus (2000)]. Such highly-branched plants can produce very large quantities of seeds, and may be useful for breeding.

HARD LESSONS FOR FARMERS

It is clear that there is a culture of idealistic believers in hemp in North America, and that there is great determination to establish the industry. As history has demonstrated, unbridled enthusiasm for largely untested new crops touted as gold mines sometimes leads to disaster. The attempt to raise silk in the US is probably the most egregious example. In 1826 a Congressional report that recommended the preparation of a practical manual on the industry resulted in a contagious desire to plant mulberries for silk production, with the eventual collapse of the industry, the loss of fortunes, and a legacy of “Mulberry Streets” in the US (Chapter 2, Bailey 1898). In the early 1980s in Minnesota, Jerusalem artichoke was touted as a fuel, a feed, a food, and a sugar crop. Unfortunately there was no market for the new “wonder crop” and hundreds of farmers lost about \$20 million (Paarlberg 1990). The level of “hype” associated with industrial hemp is far more than has been observed before for other new crops (Pinfold Consulting 1998). Probably more so than any plant in living memory, hemp attracts people to attempt its cultivation without first acquiring a realistic appreciation of the possible pitfalls. American presidents George Washington and Thomas Jefferson encouraged the cultivation of hemp, but both lost money trying to grow it. Sadly in Canada in 1999 numerous farmers contracted to grow half of Canada’s crop area for hemp for the American-based Consolidated Growers and Processors, and with the collapse of the firm were left holding very large amounts of unmarketable grain and baled hemp straw. This has represented a most untimely setback for a fledgling industry, but at least has had a sobering effect on investing in hemp. In this section we emphasize why producers should exercise caution before getting into hemp.

In Europe and Asia, hemp farming has been conducted for millennia. Although most countries ceased growing hemp after the second world war, some didn’t, including France, China, Russia, and Hungary, so that essential knowledge of how to grow and process hemp was maintained. When commercial hemp cultivation resumed in Canada in 1997, many farmers undertook to grow the crop without appreciating its suitability for their situation, or for the hazards of an undeveloped market. Hemp was often grown on farms with marginal incomes in the hopes that it was a savior from a downward financial spiral. The myth that hemp is a wonder crop that can be grown on any soil led some to cultivate on soils with a history of producing poor crops; of course, a poor crop was the result.

Market considerations also heavily determine the wisdom of investing in hemp. Growing hemp unfortunately has a magnetic attraction to many, so there is danger of overproduction. A marketing board could be useful to prevent unrestrained competition and price fluctuations, but is difficult to establish when the industry is still very small. As noted above, unwise investment in Canada produced a glut of seeds that resulted in price dumping and unprofitable levels for the majority. Cultural and production costs of hemp have been said to be comparable to those for corn, and while the truth of this remains to be confirmed, the legislative burden that accompanies hemp puts the crop at a unique disadvantage. Among the problems that Canadian farmers have faced are the challenge of government licensing (some delays, and a large learning curve), very expensive and sometime poor seed (farmers are not allowed to generate their own seed), teenagers raiding fields in the mistaken belief that marijuana is being grown, and great difficulties in exportation because of the necessity of convincing authorities that hemp is not a narcotic. Unless the producer participates in sharing of value-added income, large profits are unlikely. The industry widely recognizes that value added to the crop is the chief potential source of profit, as indeed for most other crops.

THE POLITICS OF *CANNABIS* WITH PARTICULAR REFERENCE TO THE US

Cannabis has long had an image problem, because of the extremely widespread use of “narcotic” cultivars as illegal intoxicants. The US Drug Enforcement Administration has the mandate of eliminating illicit and wild marijuana, which it does very well (Fig. 54–56). Those interested in establishing and developing legitimate industries based on fiber and oilseed applications have had to struggle against considerable opposition from many in the political and law enforcement arenas. The United States National Institute on Drug Abuse (NIDA) information web site on marijuana, which reflects a negative view of cannabis, is at www.nida.nih.gov/DrugPages/Marijuana.html, and reflects several basic fears: (1) growing *Cannabis* plants makes law enforcement more difficult, because of the need to ensure that all plants cultivated are legitimate; (2) utilization of legitimate *Cannabis* products makes it much more difficult to maintain the image of the illegitimate products as dangerous; (3) many in the movements backing development of hemp are doing so as a subterfuge to promote legalization of recreational use of marijuana; and (4) THC (and perhaps other constituents) in *Cannabis* are so harmful that their presence in any amount in any material (food, medicine or even fiber product) represents a health hazard that is best dealt with by a total proscription.



Fig. 54. The war on drugs: helicopter spraying of Paraquat herbicide on field of marijuana. (Courtesy US Drug Enforcement Administration.)



Fig. 55. The war on drugs: clandestine indoor marijuana cultivation. (Courtesy US Drug Enforcement Administration.)



Fig. 56. The war on drugs: burning seized marijuana. (Courtesy US Drug Enforcement Administration.)

Ten years ago hemp cultivation was illegal in Germany, England, Canada, Australia, and other countries. Essential to overcoming governmental reluctance in each country was the presentation of an image that was business-oriented, and conservative. The merits of environmentalism have acquired some political support, but unless there is a reasonable possibility that hemp cultivation is perceived as potentially economically viable, there is limited prospect of having anti-hemp laws changed. Strong support from business and farm groups is indispensable; support from pro-marijuana interests and what are perceived of as fringe groups is generally counterproductive. It is a combination of prospective economic benefit coupled with assurance that hemp cultivation will not detrimentally affect the enforcement of marijuana legislation that has led most industrially advanced countries to reverse prohibitions against growing hemp. Should the US permit commercial hemp cultivation to resume, it will likely be for the same reasons.

The US Office of National Drug Control Policy issued a statement on industrial hemp in 1997 (www.whitehousedrugpolicy.gov/policy/hemp%5Fold.html) which included the following: *“Our primary concern about the legalization of the cultivation of industrial hemp (Cannabis sativa) is the message it would send to the public at large, especially to our youth at a time when adolescent drug use is rising rapidly... The second major concern is that legalizing hemp production may mean the de facto legalization of marijuana cultivation. Industrial hemp and marijuana are the product of the same plant, Cannabis sativa... Supporters of the hemp legalization effort claim hemp cultivation could be profitable for US farmers. However, according to the USDA and the US Department of Commerce, the profitability of industrial hemp is highly uncertain and probably unlikely. Hemp is a novelty product with limited sustainable development value even in a novelty market... For every proposed use of industrial hemp, there already exists an available product, or raw material, which is cheaper to manufacture and provides better market results.... Countries with low labor costs such as the Philippines and China have a competitive advantage over any US hemp producer.”*

Recent European Commission proposals to change its subsidy regime for hemp contained the following negative evaluation of hemp seed: *“The use of hemp seed ... would, however, even in the absence of THC, contribute towards making the narcotic use of cannabis acceptable... In this light, subsidy will be denied producers who are growing grain for use in human nutrition and cosmetics.”*

A USDA analysis of hemp, *“Industrial hemp in the United States: Status and market potential,”* was issued in 2000, and is available at www.ers.usda.gov/publications/ages001e/index.htm. This is anonymously-authored, therefore presumably represents a corporate or “official” evaluation. The conclusion was that *“US markets for hemp fiber (specialty textiles, paper, and composites) and seed (in food or crushed for oil) are, and will likely remain, small, thin markets. Uncertainty about longrun demand for hemp products and the potential for oversupply discounts the prospects for hemp as an economically viable alternative crop for American farmers.”* Noting the oversupply of hempseeds associated with Canada’s 12,000 ha in 1999, the report concluded that the long term demand for hemp products is uncertain, and predicts that the hemp market in the US will likely remain small and limited. With respect to textiles, the report noted the lack of a thriving textile flax (linen) US industry (despite lack of legal barriers), so that it would seem unlikely that hemp could achieve a better market status. With respect to hemp oil, the report noted that hemp oil in food markets is limited by its short shelf life, the fact that it can not be used for frying, and the lack of US Food and Drug Administration approval as GRAS (“generally recognized as safe”). Moreover, summarizing four state analyses of hemp production (McNulty 1995, Ehrensing 1998, Kraenzel et al. 1998, Thompson et al. 1998), profitability seemed doubtful.

Without arguing the merits of the above contentions, we point out that the legitimate use of hemp for non-intoxicant purposes has been inhibited by the continuing ferocious war against drug abuse. In this atmosphere, objective analysis has often been lacking. Unfortunately both proponents and opponents have tended to engage in exaggeration. Increasingly, however, the world is testing the potential of hemp in the field and marketplace, which surely must be the ultimate arbiters. De Guzman (2001), noting the pessimistic USDA report, observed that “*Nevertheless, others point to the potential of [the] market. Hemp products have a growing niche market of their own, and the market will remain healthy and be well supported with many competing brands.*”

A wide variety of hemp clothing, footwear, and food products are now available in North America. Some American manufacturers and distributors have chosen to exploit the association of hemp products with marijuana in their advertising. Such marketing is unfortunate, sending the message that some in the industry are indifferent to the negative image that this generates in the minds of much of the potential consuming public. Admittedly, such advertising works. But marketing based on the healthful and tasteful properties of hemp food products, the durable nature of hemp textiles, and the environmental advantages of the crop has proven to be widely acceptable, and is likely to promote the long term development of hemp industries.

Will hemp commercial cultivation resume in the US in the foreseeable future? This is difficult to judge, but the following considerations suggest this might occur: (1) increasing awareness of the differences between industrial hemp and marijuana; (2) growing appreciation of the environmental benefits of hemp cultivation; (3) continuing demonstration of successful hemp cultivation and development in most of the remaining western world; all the G8 countries, except the US, produce and export industrial hemp; and (4) increasing pressure on state and federal governments to permit hemp cultivation by farmers, particularly wheat, corn, and tobacco farmers in desperate need of substitute crops, but also for rotation crops to break pest and disease cycles.

More than a century ago, an expert on hemp concluded his manual on hemp-growing in the US by stating “*There is no question that when the inventive genius, comprehension and energies of the American people become interested, another grand source of profitable employment and prosperity will be established*” (Boyce 1900).

MARKET DEVELOPMENT

Individual entrepreneurs, and indeed whole industries, as a matter of economic survival need to adopt a clear investment policy with respect to whether their market is to be output-driven or demand-led. From the individual producer’s perspective, the old adage “*find your market before you plant your seed*” remains sound advice.

In the mid 1990s, the EU provided subsidization for hemp cultivation of ca. \$1,050/ha. This support was instrumental in developing a hemp industry in western Europe. However, no comparable support is available in North America, and indeed those contemplating entering into hemp cultivation are faced with extraordinary costs and/or requirements in connection with licensing, security, THC analysis, and record keeping. Those involved in value-added processing and distribution are also faced with legal uncertainties and the regular threat of idiosyncratic, indeed irrational actions of various governments. Simply displaying a *C. sativa* leaf on advertising has led to the threat of criminal charges in the last decade in several G8 countries. Attempting to export or import hemp products among countries is presently a most uncertain activity.

It often takes 10 to 15 years for the industry associated with a new agricultural crop to mature. While it is true that foreign imports have been the basis for hemp products in North America for at least a decade, North American production is only 4 years of age in Canada, and farming of hemp in the US has not even begun. Viewed from this perspective, the hemp industry in North America is still very much in its infancy. Varieties of hemp specifically suited to given products and regions have only started to be developed in North America. There is considerable uncertainty regarding yields, costs of production, harvesting and processing equipment, product characteristics, foreign competition, governmental support, and the vagaries of the regulatory environment. Hemp is not presently a standard crop, and is likely to continue experiencing the risks inherent in a small niche market for some time. Hemp is currently a most uncertain crop, but has such a diversity of possible uses, is being promoted by extremely enthusiastic market developers, and attracts so much attention that it is likely to carve out a much larger share of the North American marketplace than its detractors are willing to concede.

Given the uncertainties and handicaps associated with hemp, it is fortunate that there are compensating factors. As noted, as a crop hemp offers some real environmental advantages, particularly with regard to the limited needs for herbicides and pesticides. Hemp is therefore pre-adapted to organic agriculture, and accordingly to the growing market for products associated with environmentally-friendly, sustainable production. Hemp products are an advertiser’s dream, lending themselves to hyperbole (“healthiest salad oil in the world,” “toughest jeans on the market”). While the narcotics image of *C. sativa* is often disadvantageous, advertisers who choose to play up this association do so knowing that it will attract a segment of the consuming population. In general, the novelty of hemp means that many consumers are willing to pay a premium price. It might also be said

that those who have entered the hemp industry have tended to be very highly motivated, resourceful, and industrious, qualities that have been needed in the face of rather formidable obstacles to progress.

INFORMATION RESOURCES

Organizations

- North American Industrial Hemp Council Inc.: www.naihc.org
- Hemp Industries Association: www.thehia.org
- International Hemp Association: mojo.calyx.net/~olsen/HEMP/IHA/
- Hemp Food Association: hempfood.com/
- Ontario Hemp Alliance: www.ontariohempalliance.org
- International Association for Cannabis as Medicine: www.acmed.org/english/main.htm

Web

- The Hemp Commerce & Farming Report: www.hempreport.com
- Industrial hemp information network: www.hemptech.com

Journals

- Journal of the International Hemp Association. Vol. 1 (1994)–Vol. 6 (1999). (Vols. 1–5 and part of Vol. 6 available online at mojo.calyx.net/~olsen/HEMP/IHA/). Superseded by Journal of Industrial Hemp.
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Last updated: 1/8/2003 by AW

<http://www.hort.purdue.edu/newcrop/ncnu02/v5-284.html>

http://current.com/items/89668280_hemp-could-save-america.htm

HEMP FOR VICTORY

The most recent time America asked our farmers to grow more marijuana was in 1942, in a 14-minute propaganda piece entitled Hemp for Victory.

WATCH THE VIDEO: http://www.youtube.com/view_play_list?p=A1E17C2DE07968CB

Following is a transcript of the film’s dramatic narrative:

“Long ago, when these ancient Grecian temples were new, hemp was already old in the service of mankind. For thousands of years, even then, this plant had been grown for cordage and cloth in China and elsewhere in the East. For centuries prior to about 1850 all the ships that sailed the western seas

were rigged with hempen rope and sails. For the sailor, no less than the hangman, hemp was indispensable.

A 44-gun frigate like our cherished "Old Ironsides" took over 60 tons of hemp for rigging, including an anchor cable 25 inches in circumference. The Conestoga wagons and prairie schooners of pioneer days were covered with hemp canvas. Indeed the very word canvas comes from the Arabic word for hemp. In those days hemp was an important crop in Kentucky and Missouri. Then came cheaper imported fibers for cordage, like jute, sisal and Manila hemp, and the culture of hemp in America declined.

But now, with Philippine and East Indian sources of hemp in the hands of the Japanese, and shipment of jute from India curtailed, American hemp must meet the needs of our Army and Navy, as well as of our industry. In 1942, patriotic farmers, at the government's request, planted 36,000 acres of seed hemp, an increase of several thousand percent. The goal for 1943 is 50,000 acres of seed hemp.

In Kentucky much of the seed hemp acreage is on river bottom land such as this. Some of these fields are inaccessible except by boat. Thus plans are afoot for a great expansion of a hemp industry as a part of the war program. This film is designed to tell farmers how to handle this ancient crop now little known outside Kentucky and Wisconsin.

This is hemp seed. Be careful how you use it. For to grow hemp legally you must have a federal registration and tax stamp. This is provided for in your contract. Ask your county agent about it. Don't forget.

Hemp demands a rich, well-drained soil such as is found here in the Blue Grass region of Kentucky or in central Wisconsin. It must be loose and rich in organic matter. Poor soils won't do. Soil that will grow good corn will usually grow hemp.

Hemp is not hard on the soil. In Kentucky it has been grown for several years on the same ground, though this practice is not recommended. A dense and shady crop, hemp tends to choke out weeds. Here's a Canada thistle that couldn't stand the competition, dead as a dodo. Thus hemp leaves the ground in good condition for the following crop.

For fiber, hemp should be sown closely, the closer the rows, the better. These rows are spaced about four inches. This hemp has been broadcast. Either way it should be sown thick enough to grow a slender stalk. Here's an ideal stand: the right height to be harvested easily, thick enough to grow slender stalks that are easy to cut and process.

Stalks like these here on the left yield the most fiber and the best. Those on the right are too coarse and woody. For seed, hemp is planted in hills like corn. Sometimes by hand. Hemp is a dioecious plant. The female flower is inconspicuous. But the male flower is easily spotted. In seed production after the pollen has been shed, these male plants are cut out. These are the seeds on a female plant.

Hemp for fiber is ready to harvest when the pollen is shedding and the leaves are fallen. In Kentucky, hemp harvest comes in August. Here, the old standby has been the self-rake reaper, which has been used for a generation or more.

Hemp grows so luxuriantly in Kentucky that harvesting is sometimes difficult, which may account for the popularity of the self-rake with its lateral stroke. A modified rice binder has been used to some extent.

This machine works well on average hemp. Recently, the improved hemp harvester, used for many years in Wisconsin, has been introduced in Kentucky. This machine spreads the hemp in a continuous swath. It is a far cry from this fast and efficient modern harvester, that doesn't stall in the heaviest hemp.

In Kentucky, hand cutting is practiced in opening fields for the machine. In Kentucky, hemp is shucked as soon as safe, after cutting, to be spread out for retting later in the fall.

In Wisconsin, hemp is harvested in September. Here the hemp harvester with automatic spreader is standard equipment. Note how smoothly the rotating apron lays the swaths preparatory to retting. Here it is a common and essential practice to leave headlands around hemp fields. These strips may be planted with other crops, preferably small grain. Thus the harvester has room to make its first round without preparatory hand cutting. The other machine is running over corn stubble. When the cutter bar is much shorter than the hemp is tall, overlapping occurs. Not so good for retting. The standard cut is eight to nine feet.

The length of time hemp is left on the ground to ret depends on the weather. The swaths must be turned to get a uniform ret. When the woody core breaks away readily like this, the hemp is about ready to pick up and bind into bundles. Well-retted hemp is light to dark grey. The fiber tends to pull away from the stalks. The presence of stalks in the bough-string stage indicates that retting is well underway. When hemp is short or tangled or when the ground is too wet for machines, it's bound by hand. A wooden bucket is used. Twine will do for tying, but the hemp itself makes a good band.

When conditions are favorable, the pickup binder is commonly used. The swaths should lie smooth and even with the stalks parallel. The picker won't work well in tangled hemp. After binding, hemp is shucked as soon as possible to stop further retting. In 1942, 14,000 acres of fiber hemp were harvested in the United States. The goal for 1943 is 300,000 acres of fiber hemp. Thus hemp, the old standby cordage fiber, is staging a strong comeback.

This is Kentucky hemp going into the dryer at a mill at Versailles. In the old days braking was done by hand. One of the hardest jobs known to man. Now the power braker makes quick work of it.

Spinning American hemp into rope yarn or twine in the old Kentucky river mill at Frankfort, Kentucky. Another pioneer plant that has been making cordage for more than a century. All such plants will presently be turning out products spun from American-grown hemp: twine of various kinds for typing and upholsterer's work; rope for marine rigging and towing; for hay forks, derricks, and heavy duty tackle; light duty firehose; thread for shoes for millions of American soldiers; and parachute webbing for our paratroopers. As for the United States Navy, every battleship requires 34,000 feet of rope; and other ships accordingly. Here in the Boston Navy Yard, where cables for frigates were made long ago, crews are now working night and day making cordage for the fleet. In the old days rope yarn was spun by hand. The rope yarn feeds through holes in an iron plate.

This is Manila hemp from the Navy's rapidly dwindling reserves. When it is gone, American hemp will go on duty again: hemp for mooring ships; hemp for tow lines; hemp for tackle and gear; hemp for countless naval uses both on ship and shore. Just as in the days when Old Ironsides sailed the seas victorious with her hempen shrouds and hempen sails...Hemp for Victory!"

Pot Shrinks Tumors

US Government knew this already in '74

Raymond Cushing, AlterNet May 31, 2000

The term medical marijuana took on dramatic new meaning in February when researchers in Madrid announced they had **destroyed incurable brain cancer tumors** in rats by injecting them with THC, the active ingredient in cannabis.

The Madrid study marks only the second time that THC has been administered to tumor-bearing animals; the first was a Virginia investigation 26 years ago. In both studies, the THC shrank or destroyed tumors in a majority of the test subjects.

Most Americans don't know anything about the Madrid discovery. Virtually no U.S. newspapers carried the story, which ran only once on the AP and news wires, on Feb. 29.

The ominous part is that this isn't the first time scientists have discovered that THC shrinks tumors. In 1974 researchers at the Medical College of Virginia, who had been funded by the National Institute of Health to find evidence that marijuana damages the immune system, found instead that **THC slowed the growth of three kinds of cancer in mice -- lung and breast cancer, and a virus-induced leukemia.**

The DEA quickly shut down the Virginia study and all further cannabis/tumor research, according to Jack Herer, who reports on the events in his book, "The Emperor Wears No Clothes." In 1976 **President Gerald Ford put an end to all public cannabis research and granted exclusive research rights to major pharmaceutical companies**, who set out -- unsuccessfully -- to develop synthetic forms of THC that would deliver all the medical benefits without the "high."

The Madrid researchers reported in the March issue of "Nature Medicine" that they injected the brains of 45 rats with cancer cells, producing tumors whose presence they confirmed through magnetic resonance imaging (MRI). On the 12th day they injected 15 of the rats with THC and 15 with Win-55,212-2 a synthetic compound similar to THC.

"All the rats left untreated uniformly died 12-18 days after glioma (brain cancer) cell inoculation ... Cannabinoid (THC)-treated rats survived significantly longer than control rats. THC administration was ineffective in three rats, which died by days 16-18. **Nine of the THC-treated rats surpassed the time of death of untreated rats, and survived up to 19-35 days. Moreover, the tumor was completely eradicated in three of the treated rats.**" The rats treated with Win-55,212-2 showed similar results.

The Spanish researchers, led by Dr. Manuel Guzman of Complutense University, also irrigated healthy rats' brains with large doses of THC for seven days, to test for harmful biochemical or neurological effects. They found none.

"Careful MRI analysis of all those tumor-free rats showed no sign of damage related to necrosis, edema, infection or trauma ... We also examined other potential side effects of cannabinoid administration. In both

tumor-free and tumor-bearing rats, cannabinoid administration induced no substantial change in behavioral parameters such as motor coordination or physical activity. Food and water intake as well as body weight gain were unaffected during and after cannabinoid delivery. Likewise, the general hematological profiles of cannabinoid-treated rats were normal. Thus, neither biochemical parameters nor markers of tissue damage changed substantially during the 7-day delivery period or for at least 2 months after cannabinoid treatment ended."

Guzman's investigation is the only time since the 1974 Virginia study that THC has been administered to live tumor-bearing animals. (The Spanish researchers cite a 1998 study in which cannabinoids inhibited breast cancer cell proliferation, but that was a "petri dish" experiment that didn't involve live subjects.)

In an email interview for this story, the Madrid researcher said he had heard of the Virginia study, but had never been able to locate literature on it. Hence, the Nature Medicine article characterizes the new study as the first on tumor-laden animals and doesn't cite the 1974 Virginia investigation.

"I am aware of the existence of that research. In fact I have attempted many times to obtain the journal article on the original investigation by these people, but it has proven impossible." Guzman said.

In 1983 the Reagan/Bush Administration tried to persuade American universities and researchers to destroy all 1966-76 cannabis research work, including compendiums in libraries, reports Jack Herer, who states, "We know that large amounts of information have since disappeared."

Guzman provided the title of the work -- "Antineoplastic activity of cannabinoids," an article in a 1975 Journal of the National Cancer Institute -- and this writer obtained a copy at the UC medical school library in Davis and faxed it to Madrid.

The summary of the Virginia study begins, "**Lewis lung adenocarcinoma growth was retarded by the oral administration of tetrahydrocannabinol (THC) and cannabinal (CBN)**" -- two types of cannabinoids, a family of active components in marijuana.

"Mice treated for 20 consecutive days with THC and CBN had reduced primary tumor size."

The 1975 journal article doesn't mention breast cancer tumors, which featured in the only newspaper story ever to appear about the 1974 study -- in the Local section of the Washington Post on August 18, 1974. Under the headline, "Cancer Curb Is Studied," it read in part:

"The active chemical agent in marijuana curbs the growth of three kinds of cancer in mice and may also suppress the immunity reaction that causes rejection of organ transplants, a Medical College of Virginia team has discovered." The researchers "found that THC slowed the growth of lung cancers, breast cancers and a virus-induced leukemia in laboratory mice, and prolonged their lives by as much as 36 percent."

Guzman, writing from Madrid, was eloquent in his response after this writer faxed him the clipping from the Washington Post of a quarter century ago. In translation, he wrote:

"It is extremely interesting to me, the hope that the project seemed to awaken at that moment, and the sad evolution (lastimosa evolucion) of events during the years following the discovery, until now we once

again draw back the veil' over the anti-tumoral power of THC, twenty-five years later. Unfortunately, the world bumps along between such moments of hope and long periods of intellectual castration."

Coverage of the Madrid discovery has been virtually nonexistent in the US

The news broke quietly on Feb. 29 with a story that ran once on the UPI wire about the Nature Medicine article. This writer stumbled on it through a link that appeared briefly on the Drudge Report web page. The New York Times, Washington Post and Los Angeles Times all ignored the story, even though its newsworthiness is indisputable: a benign substance occurring in nature destroys deadly brain tumors.

For the full story, pick up "The Emperor Wears No Clothes" by Jack Herer, or log on for excerpts from the book at www.jackherer.com

Update by Raymond Cushing

When I was a cub reporter twenty-eight years ago at the daily Advocate in Stamford, Connecticut, my first city editor—a white-haired veteran of the International Herald Tribune named Marian Campbell—told me that the cure for cancer was the holy grail of all news stories.

"Unless they discover the cure for cancer," she would say over the clackety-clack of the manual typewriters, "this paper goes to press on time."

What I found out a quarter-century later is that not even the cure for cancer is a big enough story to crack the Berlin Wall of media censorship in this country. Toss in the facts that the cure appears to be a benign substance that has been illegal for 63 years, and that the government knowingly suppressed evidence of its curative powers 25 years, and you get twice the story and twice the censorship.

I won't name the "investigative journalists" who didn't respond when I sent them this story. I won't list the numerous "progressive" publications that ignored it. I won't describe the forbidding sense of professional isolation I endured in the months I tried to place the story.

Suffice it to say that it's what one would expect in a society that has criminalized its own young for two generations around the cannabis issue simply because we were told to do so.

Thousands of innocent people who are in U.S. prisons for possessing or selling "the cure for cancer" await liberation and reparations. Someday our grandchildren will look back and ask, "What did you do to set the cannabis prisoners free?"

Here's what any responsible journalist should be doing:

Go to primary sources when evaluating cannabis research. The AP and other news organizations love to elevate "bad science" and suppress "good science" when it comes to cannabis. You have to read the original research articles yourself and make your own judgments.

Investigate and report on the war on children that is a major component of the war on drugs. The marijuana laws are the main tool the police use to persecute minors. No other policy affects more families in more insidious and devastating ways than cannabis prohibition.

Learn about the history of cannabis prohibition and about the pharmaceutical, liquor, and tobacco giants that are behind it. If you don't know the history of cannabis and hemp prohibition, you're too ignorant to justifiably call yourself a journalist.

If it turns out—as my story would seem to indicate—that cannabis is the cure for cancer and the government suppressed this information for 25 years (and continues to suppress it), then the body count alone will make this the biggest holocaust in recorded history. Virtually all federal drug policy makers of both parties since 1975—including legislators, presidents and the DEA—will be complicit and criminally liable.

That's why they don't want this story covered.

Raymond Cushing: raymondcushing@ireland.com

Please Also Read: [Marjuana or die!](#)

***Industrial-Hemp has no psychoactive properties following definition of the European Economic Community (EEC);** THC content is less than 0.3%. In general, low THC-seed varieties without psychoactive properties are those that have a THC content of less than 1%. (See also [No-THC Hemp-seed](#).) THC= Delta-9 TetraHydroCannabinol.

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A Quagmire for Our Time

by Peter Schrag

The American Prospect, August 2001



At least since 1996, when voters in California and Arizona approved ballot initiatives legalizing the medical use of marijuana, Americans have been trying to send the same message to Washington, D.C.:

The nation's escalating, \$20 billion drug war is a disastrous and costly failure that is stuffing the prisons, ruining thousands of lives both here and abroad, and producing few perceptible gains—except maybe in the careers of politicians.

With every passing year, the message becomes louder. In elections that followed passage of the California and Arizona initiatives, similar measures have been passed in Oregon, Washington State, Maine, Alaska, Colorado, and Nevada, many of them by overwhelming majorities. Last year a medical-marijuana bill

was also approved by the Hawaii legislature and signed by the governor. In the summer of 1998, Republican Congressman Bob Barr of Georgia, a leading drug-war hawk, wrote a gag rule into the District of Columbia's appropriation bill to prohibit a vote on a medical-marijuana initiative from even being counted. Ten months after the election, when a federal judge finally overthrew the ban, the count showed that it, too, had passed.

In every one of those jurisdictions, voters are, in effect, repudiating the drug war and ignoring federal lawmakers: One of every five Americans now lives in a place where state law allows people with a doctor's recommendation to smoke pot legally in order to mitigate symptoms not easily controlled by federally licensed drugs-particularly to relieve chronic pain or nausea caused by chemotherapy for cancer, to reduce ocular pressure in glaucoma, to fight debilitating weight loss caused by AIDS, or to reduce the muscle spasms of multiple sclerosis.

That's not all. Drug-law reform-what Barr calls "this subversive criminal movement"-has gone well beyond medical marijuana. Last November a campaign led by a veteran California political consultant named Bill Zimmerman and funded by a trio of deep pockets-billionaire financier George Soros, Cleveland insurance executive Peter Lewis, and John Sperling, president of the for-profit University of Phoenix- secured passage of California's landmark Proposition 36, which requires that anyone convicted of simple possession of an illicit drug be sent to treatment, not to prison. The measure, which went into effect July 1, appropriates \$120 million annually for additional treatment services. California's nonpartisan legislative analyst estimates that it will keep some 30,000 individuals a year out of prison and save the state \$500 million in prison construction costs and between \$200 million and \$250 million annually in prison-operating costs.

Looking for states in which to run Proposition 36-type ballot measures in November 2002; Zimmerman is now conducting polls and running focus groups in Florida, Ohio, Michigan, and Missouri. The poll results in Florida, he says, are as favorable as they were in California. So far, of the 15 drug reform initiatives Zimmerman has run, 14 have been approved.

The list goes on. The New Mexico legislature, with the strong backing of Republican Governor Gary Johnson, approved bills earlier this year permitting pharmacies to sell syringes over the counter to drug users in order to reduce the risk of HIV transmission; expanding funding for drug treatment; restoring voting rights to convicted felons; and allowing the early release and treatment of women convicted of nonviolent drug-related offenses. And New York Governor George Pataki, another Republican, has been calling for reform of the state's 1973 Rockefeller drug laws, under whose "mandatory minimum" sentences even some first-time offenders-individuals charged merely with possession-have been given prison terms of as much as 15 years to life. For Ethan Nadelmann, who heads the Soros-funded Lindesmith Center-Drug Policy Foundation, all these reforms aim for "harm reduction"-to control the medical and social effects of drug use as well as the corollary damage that results from enforcement of punitive drug-control laws. Their focus is on reducing deaths from drug overdoses, bringing down the rate of HIV infection by encouraging needle exchanges, getting

nonviolent drug offenders out of prison and into treatment, and "wasting less taxpayer money on ineffective criminal policies." This is the sagebrush rebellion of the left.

DOPEY DRUG WARRIORS

But the feds don't get it, or pretend not to get it. There's too much money and too many jobs in the drug war, and being "tough" on drugs is politically safer than the uncertain ground of moderation. And so federal resistance to reform remains as adamant as ever. In 1988, following an extended review of the research, Francis L. Young, an administrative law judge of the Drug Enforcement Administration, issued a voluminous ruling that marijuana "has been accepted as capable of relieving the distress of great numbers of very ill people, and doing so with safety under medical supervision. It would therefore be unreasonable, arbitrary and capricious for DEA to continue to stand between those sufferers and the benefits of this substance in light of the evidence in this record." But despite Young's decision, as well as a string of other appeals and scattered attempts in Congress to move marijuana into the DEA's Schedule II category of drugs—a class that doctors may prescribe and that includes morphine and other narcotics—the DEA has refused to reclassify marijuana. It remains a Schedule I drug, a classification that means it is officially a substance with a high potential for abuse and no proven medicinal use, and thus is treated as contraband except for research under extremely restricted circumstances.

Last winter, in the months immediately after George W. Bush's election, some drug-law reformers thought the new president might become to drugs what Richard Nixon was to China. As a candidate, Bush once declared that marijuana ought to be a state issue; as recently as January he acknowledged that "a lot of people are coming to the realization that maybe long minimum sentences for first-time users may not be the best way to occupy jail space and/or heal people from their disease." At the same time, some senior members of the administration were indicating that there would be a shift in the drug war from interdiction and crop destruction to prevention and treatment. (Bill Clinton said the same thing but never acted on it.) So far, however, it's been mostly lip service. In Attorney General John Ashcroft, Bush picked a conservative who says he wants to "escalate the war on drugs." And in early May, when Bush chose two devoted drug warriors for the administration's key drug jobs, the direction seemed even clearer. To head the DEA: Representative Asa Hutchinson of Arkansas, a moral crusader who thinks that it would be a great idea to use federal funds to campaign against state marijuana initiatives and who opposes any research on medical use of marijuana because "it would send the wrong message to children." And for drug czar: John P. Walters—once chief deputy to William Bennett, drug boss under Bush pere; a hard-liner on criminal penalties for drug users; a strong opponent of any medical exceptions for marijuana use; and a hawk who favors using the military in the drug war. A few days after those announcements, Bush approved a grant of \$43 million to the Taliban in Afghanistan—the most cruel, repressive, and anti-American regime on earth—for its success in eradicating the opium poppy crop. This is how America supports freedom.

"The most effective way to reduce the supply of drugs in America is to reduce the demand for drugs in America," Bush said in a Rose Garden ceremony introducing his new drug warriors. "Therefore, this

administration will focus unprecedented attention on the demand side of this problem." Did Bush get the irony? In the president's proposed budget, of every \$20 for antidrug activities only about one dollar goes to treatment programs. Two-thirds of the allocation goes to law enforcement, including a hefty 21 percent increase for federal prisons. It's hard to think of another issue on which Washington is more out of sync with voters-or with the states-than it is on the drug war.

Drug-war enthusiasts like Bob Barr and activists like Sue Rusche-executive director of the Atlanta-based National Families in Action, probably the largest private antidrug organization in the country-argue that it's the billionaire Soros who has seduced the country into embracing all those drug-reform initiatives. Rusche may be right that the current reform campaign wouldn't be possible without the money from Soros and a few other deep pockets. She's probably also correct in regarding medical marijuana as what one reformer called "the big enchilada of reform"-the beginning of what she sees as a slippery slope toward the decriminalization of other drugs. But compared with the more than \$185 million the feds spend annually on antidrug advertising and education campaigns and the billions that go into the rest of the drug war, the Soros money is peanuts. Even Barry McCaffrey, who was Bill Clinton's drug czar, acknowledged as much. "The drug legalization people," he told Congress a couple of years ago, "don't have a fraction of the power that we have now brought to bear on this issue."

Soros and friends are fishing in well-stocked waters: Most Americans seem to understand that despite the regular announcements of big drug busts and the breakup of yet another family of South American drug lords, illegal drugs are as plentiful as ever, and often cheaper than they have ever been. In a poll conducted in March by the Pew Research Center for the People and the Press, 74 percent of respondents declared that the nation's costly drug war-up from \$4.7 billion in 1988 to \$20 billion now-is a failure. While most Americans are not ready for legalization, the majority say that drug abuse should be treated as a disease, not a crime. And a whopping 73 percent also say that doctors should be allowed to prescribe marijuana to their patients.

Those numbers aren't surprising. By now, it's become folk wisdom that the huge run-up in the nation's enormous prison population has been driven in considerable part by the drug laws. Of the 1.2 million drug arrests in this country in 1999, 80 percent were for possession, and more than half of those for possession of marijuana. And when 35 percent of American adults 26 years or older have tried marijuana but only 5.4 percent still smoke it, they surely have begun to suspect that pot isn't the highway to addiction that prohibitionists depict. By now they've also heard enough stories about first-time drug offenders who've been sent away to murderer- and rapist-length prison terms to know that something is seriously wrong. More than 300,000 Americans are in prison on drug charges, roughly 12 times as many as there were in 1980, at an annual cost of more than \$6 billion in prison expenses alone. Currently 31 percent of all admissions to state prisons are drug offenders, of whom a vastly disproportionate number are blacks. It's hardly surprising that there's now a Families Against Mandatory Minimums Foundation, which claims 20,000 members in 25 chapters across the country.

THE GOVERNMENT VERSUS THE PEOPLE

Zimmerman's drug-law-reform campaign began almost accidentally after a nurse in Southern California named Anna Boyce, a member of a neighborhood anticrime patrol, reported a burglary one night. When the deputies arrived to investigate, they found a small amount of pot, which the owner of the home, a lawyer, used to control the pain from his rheumatoid arthritis. The burglars were never caught, but the lawyer was busted and charged with possession. As Zimmerman tells the story, "Boyce was so outraged that she launched a campaign to allow patients to use marijuana as medicine." Twice the California legislature passed the resulting bill; twice Governor Pete Wilson vetoed it. It was at that point that Boyce turned to Nadelmann's organization, which brought in Zimmerman.

Zimmerman and his backers freely acknowledge that their ultimate objective is not to rewrite state laws but to change federal ones. The initiative route, though often clumsy and inflexible, they believe, is simply the fastest way-and the cheapest-to send the message.

But law enforcement still speaks a lot louder in Washington than does treatment or drug-law reform. Shortly after California passed the medical-marijuana initiative in 1996, McCaffrey, U.S. Attorney General Janet Reno, and other senior members of the Clinton administration warned that any physician caught discussing marijuana with a patient would be subject to revocation of his or her authority to prescribe drugs under the terms of the federal Controlled Substances Act-a sanction that, if carried out, would ruin the doctor's practice. Although the administration later softened the threat to target only physicians "recommending" marijuana to patients, two federal judges, responding to a suit filed by doctors and patients, ultimately enjoined the government from issuing such threats-which, in effect, would have amounted to a gag rule-or from launching any investigations on that ground. "If such recommendations could not be communicated," said U.S. District Judge William Alsup in a decision handed down last September, "the physician-patient relationship would be seriously impaired." Recommending pot is not the same as providing it, he ruled, and patients have a right to know their doctors' recommendations: Even if they could not get drugs legally, they would know enough to try to change the law-which, of course, is what they've been trying to do.

But it's on the matter of supply that the government has concentrated its response. Ever since the first medical-marijuana initiatives passed, the government has sought to shut down groups like the Oakland Cannabis Buyers Cooperative (OCBC), which distributed pot to those it regarded as legitimate users. A liberal three-judge panel of the Ninth U.S. Circuit Court of Appeals accepted the OCBC argument that since patients with no other remedies but pot could offer a medical-necessity defense in a criminal case, so could the supplier use it against the government's attempt to close it in a civil action. But in an 8-0 decision handed down in May, the Supreme Court ruled that there was no room in federal law for any medical-necessity exception for the cannabis clubs. (Significantly, three of the eight justices pointedly declared, in a concurring opinion by Justice John Paul Stevens, that the medical-necessity defense "might be available to a seriously ill patient for whom there is no alternative means of avoiding starvation or extraordinary suffering.")

The decision, however, did not overturn the medical marijuana laws; what it did instead was create more uncertainty for both medical-pot users and the government. The feds had brought the suit in the first place knowing that if they went after either small-time growers or individual users in discrete criminal prosecutions, a costly and cumbersome process in any case, they risked wholesale acquittals-essentially nullification of the law-by juries composed of many of the very same people whose sympathy toward cancer patients and glaucoma victims led them to vote for medical marijuana in the first place. Better, then, to try civil injunctions as in the OCBC case-without the burden of fines or imprisonment, or juries-to put the distributors out of business.

But now that the court has made its decision, who is going to enforce it-and how? If the government succeeded in shutting down centralized distributors like OCBC, it would simply drive the supply system toward the black market, with its additional risks, or into other channels. The Oregon initiative, for example, specifically allows any patient registered as a medical marijuana user with state authorities-a certificate is available with a physician's recommendation-to grow up to seven marijuana plants, or to have a designated caregiver grow them on the patient's behalf. Kelly Paige, who runs the Oregon Medical Marijuana Registry, says she's not sure whether two or more people could designate the same caregiver: Could someone grow 21 plants for three patients or 700 for 100 patients? Paige says that there's a "gray area in the law" on that point. But what is clear is that the state's registry, now with 2,500 names, is growing at a rate of 50 a week. Will the government seek to shut that down, thereby not only creating more law enforcement problems but setting up a major state-federal confrontation?

The Nevada initiative, passed by a 65 percent majority last November, has even more interesting implications. It requires the legislature to approve "appropriate methods for supply of the plant to patients authorized to use it" and has consequently prompted a bill, so far stalled in the legislature, authorizing the state to grow and distribute the pot. Following the 1999 initiative approved in Maine, a similar bill was being considered there. If Uncle Sam were to take on the states in such cases, federal law would clearly prevail. But does an administration professing to respect states' rights really want to embark on a campaign in which it seeks to thwart what would quickly be called the will of the people?

WHAT GEORGE SOROS AND WILLIAM F. BUCKLEY HAVE IN COMMON

The debate about drugs and the drug war spawns all sorts of wacky theories. One is that marijuana is a "gateway drug" that soon leads users to crack and heroin. Another, suggested by Calvina Fay, executive director of the Drug Free America Foundation, is that Soros and his fellow money bags fund the reform movement because they "are business people" who sooner or later hope to be making money in the trade. It's true that the reformers are squinting toward something that ultimately looks a lot more like decriminalization, if not legalization, and that the compassionate-marijuana-use campaign is itself, in effect, a gateway to a broader libertarian agenda to decriminalize all drugs. Joseph Califano-Jimmy Carter's secretary of health, education, and welfare, who now heads Columbia

University's National Center on Addiction and Substance Abuse-calls Soros "the Daddy Warbucks of drug legalization."

But on that issue, Soros has estimable company-from William F. Buckley to former Secretary of State George P. Shultz to economist Milton Friedman. Nadelmann says that Soros, an emigre from eastern Europe, was offended that in the United States, a model for democracy around the world, "there is no open dialogue on this issue," and that given Congress's attempts to stifle research and suppress debate-not to mention the huge number of people incarcerated for drug addiction-"this is not an open society."

Soros, with his global interests, sees the issue in international terms: in possible adaptations of the treatment-centered drug policies of western Europe; in resisting what Nadelmann describes as the danger of a Cambodia-style escalation-into Ecuador, back into Peru, perhaps into Brazil- of Washington's \$1.3-billion Plan Colombia, the bloody, U.S.-funded South American guerrilla war cum coca-eradication program; and in the reformers' wider campaign of harm reduction and drug regulation (as with tobacco and alcohol) instead of prohibition. If Colombian cocaine production were stopped tomorrow, Nadelmann said, "the U.S drug problem would change only peripherally."

That view has support in Latin America as well-from Mexican President Vicente Fox, who said he'd legalize drugs if he could, and his foreign minister, Jorge Castaneda, who says it's time "for rethinking . . . this absurd war no one really wants to wage"; and from a growing list of prominent people-Americans and others-who signed a Soros-funded "open letter" (ostensibly directed to UN Secretary-General Kofi Annan) declaring that "the global war on drugs is now causing more harm than drug abuse itself." Among the signers: former Costa Rican President Oscar Arias, former Nicaraguan President Violeta Barrios de Chamorra, former Colombian President Belisario Betancur, Harvard paleontologist Stephen Jay Gould, former Kansas City Police Chief Joseph McNamara, Stanford University President Emeritus Donald Kennedy, and scores of others-academics, physicians, cabinet ministers, members of parliament, prosecutors, and judges.

More immediately, in April the Canadian government liberalized rules for the medical use of marijuana and began to move toward an Oregon-style system in which physician-certified users or designated caregivers may grow limited amounts of pot. At almost the same moment, U.S.-subsidized Peruvian Air Force fighters, pursuing what a Central Intelligence Agency tracking plane had tentatively identified as a bunch of drug runners flying over the Brazilian-Peruvian border, shot down a plane carrying American Baptist missionaries-killing a mother and her infant-and then strafed the survivors clinging to the plane's wreckage. No one can count how many Peruvians, Bolivians, and Colombians have been killed or driven off their land in the same war.

REFORMING REEFER MADNESS

At this point, even the scientific debate in this country about the medical use of marijuana is so hampered by politics and fraught with so much extraneous cultural baggage that it can hardly be conducted at all. Two years ago, the National Academy of Sciences' Institute of Medicine issued

Marijuana and Medicine: Assessing the Science Base, an extensive, two-year, administration-commissioned review of the research that debunks the contention that marijuana is a "gateway drug" for the young (alcohol and tobacco, it points out, are far more common gateways). "Smoked marijuana should generally not be recommended for long-term medical use," says the report. "Nonetheless, for certain patients, such as the terminally ill or those with debilitating symptoms, the long-term risks are not of great concern." But even the Institute of Medicine report, which has been cited by drug prohibitionists to prove that smoked marijuana is addictive and medically useless, is bogged down in controversy.

The prohibitionists argue that other drugs are available to control nausea, pain, and the other symptoms for which patients smoke pot. The most important, a synthetic form of THC, one of marijuana's psychoactive compounds, comes in a pill under the trade name Marinol. But many patients have found the highs and other side effects of THC pills hard to control; others, suffering from nausea, can't even hold the pills down. Smoking marijuana, they say, generally acts faster and makes it possible for them to self-regulate the amount of the drug they absorb into their systems. The critics of reform are right that the medical-marijuana flag is being flown by a lot of users-and dealers-who have no clearly defensible medical reason for possessing pot or who stretch the definition of medicinal usage to the breaking point. (In Petaluma, California, for instance, two men who were recently arrested and tried for running a pot farm on which they were growing nearly 900 plants in a barn and half a dozen greenhouses and selling the stuff at a 100 percent markup. They said they were doing it for "compassionate use" under the state's medical-marijuana act.) At the same time, however, a lot of potentially legitimate users in states such as Hawaii, which has legalized medical use, are afraid to enroll in state registries, which are open to law enforcement officers, for fear of prosecution. But that's all the more reason to have a regulated system that allows all concerned-patients, doctors, and cops-to determine what is and isn't legitimate medical use.

Every one of the new reforms is now being tested-in the field, in the courts, and in the public arena. Increasing amounts of the movement's resources and energy are now being spent on these tests, which offer the most real hope for sanity in drug policy and are likely to determine the future of the reform drive. Probably the biggest test has just begun in California with the implementation of Proposition 36, the drug-treatment initiative, which Zimmerman and Nadelmann hope will be a model for other states. During the campaign last year, opponents-among them cops, district attorneys, some judges, and, most prominently, the state's powerful prison guards' union-charged that the new law's enforcement machinery would be too cumbersome to make addicts cooperate and keep them in treatment until they're clean. Under the old law, drug-court judges could send addicts to treatment as a condition of probation; if they failed to cooperate, they could be jailed without further ado. Under the new initiative, resisters and backsliders are entitled to a hearing before they can be sent to prison. The opponents also contended that the state simply doesn't have the treatment facilities or the trained personnel to handle the expected 30,000-plus cases- heroin addicts, coke snorters, meth users, and others convicted of drug possession-that are expected to be driven into the system each year. The existing system, they charged correctly, doesn't have nearly enough capacity or trained

therapists to handle even those who voluntarily seek treatment. In San Francisco, the city's health department has more than 1,000 people on its waiting list at the end of each month.

Zimmerman says that the \$120 million that the initiative appropriates for each of the next five years should be sufficient to provide the necessary services-because while some people require extended residential treatment, most do not. But for much of the past spring, there was a great deal of arm wrestling between probation departments and health officials about who got how much of the money. In essence, the same law-enforcement groups that said the state was short of treatment facilities tried to snatch a large share of the treatment money for themselves.

The outcome of the new reform laws is hardly assured. The public has obviously moved on the issue and so have national politicians like Republican Senator John McCain of Arizona and Democratic Senators Barbara Boxer of California and Patrick Leahy of Vermont. (All three said that their views were affected by *Traffic*, the grainy, documentary-style film about the futility of the drug war at the Mexican border-which, if true, shows how primitive congressional understanding of the drug issue really is.) And so, it appears, have some Bush cabinet officials, including Health and Human Services Secretary Tommy Thompson, who as governor of Wisconsin supported some needle exchange programs and has since succeeded in getting a supporter of such programs named as the administration's AIDS "czar." Even McCaffrey, Clinton's drug general, left office early this year sounding more moderate than he had when he began, talking now about "holistic" policies, saying the country should stop using the term "drug war," and distancing himself from the "drug gulag."

Nadelmann says drug-law liberalization is roughly where gay rights was a decade ago: "It's a matter of cultural transformation." That hardly means that enlightenment is just 10 years off. Our fundamental ambivalence as a nation-between our concern for AIDS, cancer, and glaucoma patients with no real alternatives but smoked marijuana and our powerful sense that heroin and crack are dangerous and destructive substances; between citizens who understand that our existing policies of interdiction and repression are failing and the real fears of those same citizens as parents that their children may be in jeopardy; between our libertarianism and our puritanism-is likely to make us hesitate. The kids who experiment with deceptively dangerous meth-type drugs like ecstasy and end up in the emergency room seem to be younger than they've ever been before, and they're scaring a lot of people. "The public," said Rusche, "has been badly deceived" by the drug-reform campaign. "There'll be a backlash." If we start reading stories about addicts released under reform-law diversion programs committing ugly crimes, or more items about teenagers overdosing on ecstasy or coke at rave clubs, Rusche could turn out to be a prophet.

At the same time, however, let's not underestimate the possible backlash against the stupidity and rigidity of the drug warriors in Washington-or the power of existing federal policy, the excesses of the drug war, and unbending state criminal statutes such as the Rockefeller drug laws to energize the reform campaign. A government of drug-war militants like Bob Barr, Asa Hutchinson, and John Walters may be the best way to move the rest of the country toward moderation. Every time thoughtful voters hear that old reefer-madness rhetoric, the credibility of the larger antidrug message

is undermined—as is the legitimacy of a national drug policy that, despite administration talk about treatment, is still rooted in the criminal justice system, not in the medical system. The votes and the polls of the past five years indicate that Americans seem quite capable of distinguishing between outright legalization, which they fear, and the excesses of the drug war, which they reject. It's eerie how much the quagmire of the drug war, at home and abroad, is beginning to resemble that other quagmire of a generation ago. Bust a few hundred more solid citizens who are trying to control their chemotherapy-caused nausea with pot, shoot down a few more Baptist missionaries in Peru, move a step closer toward actual American military involvement in Colombia, and who knows how much further reform could go?

PETER SCHRAG, the former editorial-page editor of the Sacramento Bee, is a TAP senior correspondent and the author of *Paradise Lost: California's Experience, America's Future*.

● War on Drugs

http://www.thirdworldtraveler.com/Drug_War/Quagmire.html

What Do Empires Do?

by Michael Parenti, Common Dreams
February 14, 2010

For centuries the ruling interests of Western Europe and later on North America and Japan went forth with their financiers---and when necessary their armies---to lay claim to most of planet Earth, including the labor of indigenous peoples, their markets, their incomes (through colonial taxation or debt control or other means), and the abundant treasures of their lands: their gold, silver, diamonds, copper, rum, molasses, hemp, flax, ebony, timber, sugar, tobacco, ivory, iron, tin, nickel, coal, cotton, corn, and more recently: uranium, manganese, titanium, bauxite, oil, and--say it again--oil.



California Marijuana Penalties

*[decriminalized](#) + [medical](#) 🌿 [hemp](#)

[Details](#) [About this report](#)

		Incarceration	Fine
Possession			
28.5 g or less	infraction	none	\$100
More than 28.5 g	misdemeanor	6 months	\$500
28.5 g or less on school grounds by a minor while school is in session	misdemeanor	10 days	\$250
More than 28.5 g on school grounds while school open	misdemeanor	6 months	\$500
Cultivation			
Any amount (exception for patients or caregivers)	felony	16 - 36 months	none
Sale			
Gift of less than 28.5 g	misdemeanor	none	\$100
Any amount	felony	2 - 4 years	none
Any amount to a minor over 14 years old	felony	3 - 5 years	none
Any amount to a minor under 14 years old (includes offering, inducing, distributing, or employing)	felony	3 - 7 years	none
Miscellaneous (paraphernalia, license suspensions, drug tax stamps, etc...)			
Any conviction of minor under 21 causes driver's license suspension for 1 year.			

Details

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Possession of 28.5 grams or less of marijuana is now a civil infraction; no longer an arrestable offense. The offender is subject to a civil fine of \$100. Possession of greater than 28.5 grams is punishable by up to six months in jail and a fine of up to \$500.

Possession of 28.5 grams or less of marijuana on school grounds when the school is in session is punishable by up to 10 days in jail and a \$250 fine. Possession of greater than 28.5 grams or more of marijuana in a school zone is punishable by up to six months in jail and a fine of up to \$500.

Proposition 36

The Substance Abuse and Crime Prevention Act passed by 61% in 2000

The cultivation or processing of any amount of marijuana is punishable by up to sixteen months in state prison. There is an exception to the cultivation prohibition for patients or patients' caregivers who possess or cultivate for personal use by the patient upon approval of a physician.

The laws regarding possession and cultivation of marijuana do not apply to patients or patients' primary caregivers who possess or cultivate marijuana for the personal medical use of the patient, upon the recommendation or approval of a physician.

Selling marijuana in any amount is punishable by 2 - 4 years in the state prison. Giving away less than 28.5 grams is a misdemeanor and is punishable by a fine of up to \$100.

Sale of marijuana to a minor is punishable by 3 - 5 years in prison.

For anyone under the age of 21 convicted of any of the above offenses, the state may suspend the offender's driver's license for up to one year.

Possession of paraphernalia is a civil fine of \$200-\$300 for the first offense and goes up to \$5,000-\$6,000 for a fifth or subsequent violation within a five-year period.

A breakdown of CA county and local medical marijuana guidelines is available here:

<http://www.safeaccessnow.net/countyguidelines.htm>.

 **Decriminalization:** The state has decriminalized marijuana to some degree. Typically, decriminalization means no prison time or criminal record for first-time possession of a small amount for personal consumption. The conduct is treated like a minor traffic violation.

 **Medical marijuana:** This state has [medical marijuana](#) laws enacted. Modern research suggests that cannabis is a valuable aid in the treatment of a wide range of clinical applications. These include pain relief, nausea, spasticity, glaucoma, and movement disorders. Marijuana is also a powerful appetite stimulant and emerging research suggests that marijuana's medicinal properties may protect the body against some types of malignant tumors, and are neuroprotective. For more information see NORML's [Medical Marijuana section](#).

 **Hemp:** This state has an active [hemp industry or has authorized research](#). Hemp is a distinct variety of the plant species *cannabis sativa L.* that contains minimal (less than 1%) amounts of tetrahydrocannabinol (THC), the primary psychoactive ingredient in marijuana. Various parts of the plant can be utilized in the making of textiles, paper, paints, clothing, plastics, cosmetics, foodstuffs, insulation, animal feed, and other products. For more information see NORML's [Industrial Use](#) section.

Also see [Federal Laws](#)

http://norml.com/index.cfm?wtm_view=&Group_ID=4525