

Statement of
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on

SB 348
(74th Oregon Legislative Assembly)
Relating to Industrial Hemp

before the

Environment and Natural Resources Committee
Oregon Senate

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My name is Andy Kerr, I live in Ashland, Oregon, and I am a board member and treasurer of the North American Industrial Hemp Council (www.naihc.org). NAIHC's mission is

Form and establish relationships between academia, farmers, agribusiness, manufactures, government, public interest groups, and marketing firms with emphasis on land management, economic and environmental considerations;

Develop policies to enhance the stewardship of our lands through the sustainable cultivation, product development, manufacturing and marketing of industrial hemp and other comparable annual fiber crops;

Promote the development of new products and business based on industrial hemp fibers and seeds; and

Cooperatively foster a better understanding of industrial hemp and other annual fiber crops and their implications for the environment and rural economic development.

According to Vote Hemp, to date, twenty-eight states have introduced hemp legislation and fifteen have passed legislation; seven (Hawaii, Kentucky, Maine, Maryland, Montana, North Dakota and West Virginia) have removed barriers to its production or research.ⁱⁱ

SB 348 is a well-written bill that deserves to be enacted into law.

My primary interest in industrial hemp is as an alternative to wood for the use of paper and construction projects. When I was executive director of Oregon Natural Resources Council (now Oregon Wild) I commissioned an alternatives crops researcher at Oregon State University to evaluate the potential of cultivating industrial hemp in the Pacific Northwest.ⁱⁱⁱ The summary of the report states:

For many centuries hemp (Cannabis sativa L.) has been cultivated as a source of strong stem fibers, seed oil, and psychoactive drugs in its leaves and flowers. Environmental concerns and recent shortages of wood fiber have renewed interest in hemp as a raw material for a wide range of industrial products including textiles, paper, and composite wood products. This report assesses the agricultural feasibility of industrial hemp production in the Pacific Northwest (PNW).

Hemp is an herbaceous annual that develops a rigid woody stem ranging in height from 1 to over 5 meters (3 to 19 feet). Hemp stalks have a woody core surrounded by a bark layer containing long fibers that extend nearly the entire length of the stem. Plant breeders have developed hemp varieties with increased stem fiber content and very low levels of delta-9-tetrahydro-cannabinol (THC), the psychoactive ingredient of marijuana.

Historically, hemp fiber was used mainly for cordage, but it can also be made into textiles, paper, and composite wood products. Demand for hemp cordage peaked in the late 1800's, and world hemp production has continuously declined since that time, except for brief increases during both World Wars. Hemp fiber has largely been replaced by relatively inexpensive natural and synthetic fibers.

Although hemp is well adapted to the temperate climatic zone and will grow under varied environmental conditions, it grows best with warm growing conditions, an extended frost-free season, highly productive agricultural soils, and abundant moisture throughout the growing season. When grown under proper conditions, hemp is very competitive with weeds, and herbicides are generally not required in hemp production. Although a number of insect pests and diseases have been reported on hemp, significant crop losses from pests are not common. High levels of soil fertility are required to maximize hemp productivity. Cultural requirements and production costs are quite similar to those of corn. Reported hemp yields range from 2.5 to 8.7 tons of dry stems per acre.

The climatic and soil requirements of hemp can be met in some agricultural areas of the PNW, however, hemp will almost certainly require irrigation to reliably maximize productivity in the region. The requirement for supplemental irrigation will place hemp in direct competition with the highest value crops in the PNW, limiting available acreage. Stem yields will have to be substantially higher than those previously recorded for hemp to be economically feasible in the PNW at current prices. It is unlikely that the investment needed to improve hemp production technology will be made until legislative restrictions are removed from the crop.

NAIHC is not interested in legalizing marijuana. In fact, industrial hemp cultivation would make marijuana growing more problematic. The citations for the information noted below are at the end of this testimony.^{iv}

While most taxonomists currently classify both industrial hemp and marijuana as *Cannabis sativa*, this species of the Cannabaceae family has hundreds of varieties that have been selected for fundamentally different characteristics. A variety of *C. sativa* that is high-grade marijuana isn't useful for making fiber products and vice versa. Comparing industrial hemp to marijuana is like comparing a Saint Bernard to a Chihuahua — the same “species” yes, but bred for purely different purposes.

Marijuana growers favor strains that have high amounts of the cannabinoid delta 9 tetrahydrocannabinol ("THC"), the primary psychoactive ingredient that causes the buzz. Today's marijuana varieties generally have between 5-20% THC. One strain has been measured at 28% THC.

Industrial hemp growers favor strains that have been bred to maximize the quantity and/or quality of fiber, seed and/or oil. Coincidentally, breeding for these characteristics tended to select out the characteristic of high-THC.

No one would want to smoke industrial hemp. Standard varieties of industrial hemp have a THC content of between 0.2% and 1%. To receive a standard psychoactive dose would require a person to power-smoke 10-12 industrial hemp cigarettes over an extremely short period of time. The large volume and high temperature of vapor, gas and smoke would be difficult for a person to withstand, much less enjoy. If one tried to ingest enough industrial hemp to get a buzz, it would be the equivalent of taking two to three doses of a high-fiber laxative. No brownies are worth that.

Smokers of industrial hemp achieve no altered state except a headache. While not having enough THC to worry about, industrial hemp is generally full of another cannabinoid called cannabidiol ("CBD"). CBD is essentially the antidote to THC, CBD being antagonistic to THC in the human body. If the goal is getting high, one not only wants a lot of THC, but as little CBD as possible.

Figure 1 is a graph of various *Cannabis* varieties measured for both their THC (vertical axis) and CBD content (horizontal axis). Those with high-THC/low-CBD ratios (Chemotype I) are high-grade marijuana, while the low-THC/high-CBD ratios (Chemotype III) are high-grade industrial hemp. The interlopers (Chemotype II) in between (ratios around 1:1) represent varieties with intermediate quantities and ratios of these cannabinoids.

Figure 1

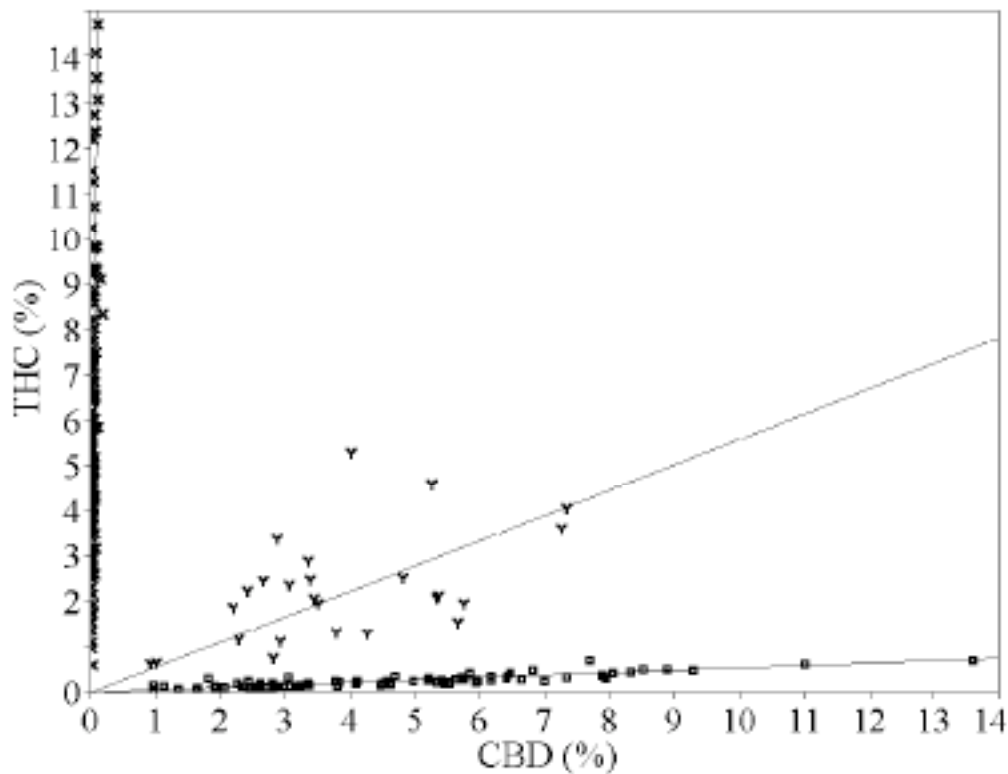


Fig. 4. Plot of Δ^9 -tetrahydrocannabinol (THC) % vs. cannabidiol (CBD) % for 253 *Cannabis* plants. Chemotype I, II, and III plants are marked with an X, Y, and square, respectively. Linear regression lines (forced through the origin) are drawn for each chemotype.

From: Hillig, Karl W. and Paul G. Mahlberg. 2004. A Chemotaxonomic Analysis of Cannabinoid Variation in *Cannabis* (Cannabaceae). American Journal of Botany 91(6): 966–975. 2004.

Not only are there differences in the chemical compositions of industrial hemp and marijuana, there are also differences in how they are grown in the field. No marijuana growers would hide their plants in an industrial hemp field. While the same species, marijuana would stand out among industrial hemp grown for fiber. Marijuana is grown at wide intervals (around 48") to maximize the production of leaves and buds, while fiber hemp is grown tightly spaced (around 2" inches apart) to maximize the production of stalk. Industrial hemp grown for seed is still more closely spaced (around 12") than marijuana. Industrial hemp grown for fiber is harvested before it goes to seed. Fiber industrial hemp is harvested just after male plants flower and spread pollen. Any marijuana "hidden" in the field would likely flower at a different time, making its presence obvious. It is also the first place the cops might look. If the United States followed the Canadian regulatory example, law enforcement officials would not need a search warrant to monitor industrial hemp fields, as farmers would have to agree to searches in order to obtain permits to grow.

Marijuana growers seek to protect the purity of their strains. The higher the THC, the higher the price received. Marijuana growers won't want industrial hemp grown anywhere near their drug plants. Cannabis produces one of the lightest of pollens, which can be carried long distances by the wind. Pollen from marijuana grown in Morocco has been detected in Spain, a distance of at least 80 miles.

If industrial hemp pollen contaminates nearby marijuana, genetically the next crop of marijuana will have — on average — approximately half the THC content of the original. Some individual plants will have as much THC as the marijuana mother, while others will have as little THC (and as much CBD) as the industrial hemp father. The problem for the marijuana grower, seller, and/or consumer is that one cannot tell which seed or plant is which, except by tedious trial and error. Growing marijuana anywhere near industrial hemp is no way to stay in the marijuana business.

Science, agriculture, industry and the government routinely distinguish between different varieties of the same species. Consider the cases of *Zea mays* and *Papaver somniferum*, better known as corn and poppies.

Farmers grow sweet corn to feed humans and field corn to feed livestock and make other products. While not easily distinguishable to the untrained eye, one can easily taste the difference. Corn breeders and growers work hard to keep these breeds apart, lest one contaminate the other.

There are dozens of varieties of poppies. One backyard variety has become of concern to the U.S. Drug Enforcement Administration (DEA) because the agency believes it could be grown for opium extraction. Yet, DEA is not going after grandmothers planting all of those other varieties of poppies in the United States, all of which have detectable amounts of opiates, including the "breadseed" poppy, which is the source of commercial poppy seeds.

In 1937, Congress enacted the Marijuana Tax Act that placed an extremely high tax on marijuana. While Congress expressly expected the continued cultivation of industrial hemp and specifically exempted the parts and products of the *Cannabis* plant known not to be psychoactive, the Federal Bureau of Narcotics lumped industrial hemp with marijuana, as does its successor the DEA to this day.

Military necessity during World War II caused a temporarily reversal in the federal policy to eliminate this distant cousin of marijuana. When Philippine supplies of Manila "hemp" (not true hemp, but actually banana leafstalk fiber) were cut off by the Japanese, the U.S. Army and U.S. Department of Agriculture urged American farmers — with both money and appeals to patriotism — to grow industrial hemp for cordage, rope and canvass. After industrial hemp helped to win the war, the federal government again became blind to the different varieties of *Cannabis*. The last commercial industrial hemp crop was grown in Wisconsin in the 1950s.

The federal Controlled Substances Act of 1970 defines "marihuana" (an archaic spelling) as "*Cannabis sativa*." However, the statute specifically states:

The mature stalks of such plant, fiber produced from such stalks, oil or cake made from the seeds of such plant, any other compound, manufacture, salt, derivative, mixture or preparation of such mature stalks (except the resin extracted therefrom), fiber, oil or cake or the sterilized seed of such plant which is incapable of germination are excluded from the definition of marihuana.

Most birdseed mixtures have industrial hemp seed, as it is quite nutritious. The seeds are sterilized before it is imported to the United States. The sterilization, however, is not always 100% effective. Many have noticed cannabis seedlings growing under their birdfeeder. Some have smoked it and learned the hard way about the different varieties of *C. sativa*.

Industrial hemp products and even the raw material itself are legally imported into the United States. In fact, those border guardians at the U.S. Customs and Border Protection have a code ("HS 530.290.00.00") on their forms for industrial hemp fiber. So, while U.S. companies import industrial hemp and manufacture industrial hemp products, U.S. farmers still cannot grow industrial hemp.

Despite the clear statutory exemption, the DEA drags its feet. One Californian who actually tried to obtain permission from DEA to grow a small plot of industrial hemp for papermaking experiments was told that such would require that the field be secured by an eight-foot chain-link fence with 18 inches of barbed wire at 45 degrees, flood lights, alarms telephonically connected to law enforcement, and a 24-hour guard. This prospective industrial hemp grower actually installed all the equipment as well as a place for the guard to live. He also bought a safe in which to store viable industrial hemp seed. Local DEA officials eventually said they were satisfied and would issue a permit to grow industrial hemp if the State of California approved, which at that time was impossible due to the then state attorney general. After the enactment by California voters of Proposition 215, which legalized marijuana for medical uses, this prospective cannabis grower amended his DEA license application to grow medical marijuana (it is still illegal in California to grow industrial hemp). At this point, DEA dropped any pretense of cooperation.

Other U.S. government agencies distinguish between industrial hemp and marijuana. Each year the State Department must certify that foreign nations are cooperating in the U.S. war on drugs. Recall that in 1989, the United States invaded Panama, deposed its president Manuel Noriega and brought him to the U.S. for trial and conviction on drug trafficking charges. If the State Department adopted the Justice Department position that all *C. sativa* is "marijuana", then the United States would have to invade Europe and arrest the British Prime Minister, the French President, the German Chancellor and all the rest. The European Union not only allows the cultivation of industrial hemp, but it subsidizes farmers to grow it.

Since it's closer, the United States might first invade Canada, which re-legalized the growing of industrial hemp in 1998. In fact, over 30 industrialized democracies distinguish hemp from marijuana. International treaties — ratified by the United States — regarding marijuana make exceptions for industrial hemp. A U.S. presidential executive order defines industrial hemp as an "essential natural resource."

If Canadian Mounties, British Bobbies and French Gendarmes can distinguish between different varieties of *C. sativa*, then why can't American cops? One very important reason is because it is not in the financial interest to do so.

An increasingly prevalent source of funding for local law enforcement is federal anti-drug money. The DEA's own records reveal that up to 94-97% by number of all the "marijuana" plants seized by law enforcement in the United States are nothing more than industrial hemp.

Because they essentially get paid by the plant, local law enforcement has an incentive to inflate the body count by seizing "ditchweed" — feral industrial hemp growing along the edge of farm fields left over from the time when it was intentionally grown. Some ditchweed has tested out as low as 0.01% THC. Any Midwestern kid knows the difference between ditchweed and dope. Actually most Midwestern cops do too, so it's all the more ironic to see the annual news stories of law enforcement seizing (actually "harvesting" their own cash crop) huge amounts of "marijuana". The television coverage often depicts cops burning haystack-sized piles of the "marijuana," usually with a cop leaning on a pitchfork and speaking into the camera and saying, "Don't get down wind of it, heh, heh, heh." It's all industrial hemp. If it were actually marijuana, would not law enforcement have acted sooner, since it's growing by the ton? Interestingly, most of these "busts" result in the seizure of a huge number of "marijuana" plants, but no arrests. One would think that the cops would have no trouble finding the person who's growing that much "marijuana" on their farm. Perhaps it is because prosecutors would never want a jury distinguishing between marijuana and ditchweed. Avoiding a jury seems to be a factor in the recurring seizures but no arrests by DEA officers of industrial hemp grown on the Ogallala Sioux Indian Reservation.

Interestingly, the annual harvests by law enforcement occur in the late fall, after the "marijuana" has gone to seed. Just like any farmer, law enforcement knows they need to leave some to seed for next year's crop, so they can get that new patrol car.

While the U.S. Justice Department cannot seem to be able to distinguish between industrial hemp and marijuana, an increasing number of state governments can. About a dozen U.S. states have laws or resolutions on the books that either decriminalize industrial hemp or petition the federal government to change federal policy to do so. North Dakota has gone so far as to have a regulatory framework in place to encourage industrial hemp production, as soon as the feds lighten up.

In an attempt to eradicate the growing industrial hemp foods and body care industry in the United States, the DEA has sought to change its regulations to prohibit any industrial hemp product that can be ingested or rubbed on. They sought to define as a controlled substance any product with any amount of THC, whether naturally occurring or synthetically produced. Modern testing techniques can detect THC down to levels of 0.01%. As technology advances, the detectable limit will go even lower. Since it's not absolute "zero," such products would violate the policy of "zero tolerance." In its proposed rules, the DEA did not allow for the importation and possession of food and cosmetic products that contain detectable amounts of THC. DEA would allow you wear, build with or drive industrial hemp-containing products as

long as you didn't ingest them or rub them on your body. Fortunately the U.S. Ninth Circuit Court of Appeals found DEA's proposed rules arbitrary and capricious and contrary to law.

While high-valued industrial hemp seed, seed cake and oil can profitably be imported from Canada to the United States for use in food and body care products, the bulk nature of fiber means that transportation costs are prohibitive. For fiber production industrial hemp must be grown locally. Since some Canadian farms are very close to some United States manufacturing plants, processed industrial hemp is currently imported to make automobile parts in Michigan. (In fact, every major manufacturer uses industrial hemp for automobile parts.)

Complicating U.S. relegalization efforts are self-described "hempsters" or people who believe that all things and thoughts cannabis will solve all the world's problems. Hempsters often exaggerate the benefits of industrial hemp and conflate the issues of industrial hemp, medical marijuana and recreational marijuana. Typical of hempsters' belief and rhetoric is this letter to the editor of the *Ecologist* magazine:

Put Your Hope in Hemp

In Derrick Jensen and Remedy's article about deforestation (Feb. 2004) they talk about hope, but without mentioning the viable alternative that is hemp. 1 acre of hemp can provide as much timber products as 4 acres of trees, every four months. That same acre can provide as much fiber as four acres of trees, and enough cellulose to make 1,000 gallons of gasoline. This very same acre of hemp will also provide 100lbs of seeds to make foods or other oil products from. In short one acre of hemp would simultaneously allow farmers to profit from three different markets, every four months.

Michele Bajan, by email

Besides being redundantly repetitive (or at least repetitively redundant), the author has triple allocated the biomass, once to "timber" products, once to "fiber" and once again to "gasoline" (actually ethanol). If she is thinking cellulosic ethanol, the fiber gets converted to liquid and cannot also be used for construction products. She also envisions co-producing maximum fiber and seed on the same acre. In reality, fiber hemp is grown very tightly spaced to maximize stalk (fiber) and harvested before it goes to seed, while industrial hemp for seed is more widely spaced to allow more flowering for seeds. Finally, she projects three crops annually. That's one hell of an acre and one hell of a stand of industrial hemp. Unfortunately, the author doesn't reveal what planet this fantastic acre is on.

Of course, in exaggerating and mischaracterizing industrial hemp, hempsters are no more or less guilty than the U.S. Justice Department and Drug Enforcement Administration.

Will industrial hemp cultivation in Oregon be economically viable? No one knows. The only way to find out is to try it. The market, not government, should determine economic viability.

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ⁱⁱ <http://votehemp.com/state.html>

ⁱⁱⁱ Ehrensing, Daryl T. 1998. Feasibility of Industrial Hemp Production in the United States Pacific Northwest. Department of Crop and Soil Science, Oregon State University. Station Bulletin 681 (<http://cropandsoil.oregonstate.edu/Hemp/body.html>).

^{iv} New research suggests that not all *Cannabis* is *Cannabis sativa*, but may be **different species** (Hillig, Karl. 2004. Genetic Resources and Crop Evolution (in press).) **CBD and THC levels in *Cannabis*** discussed in Hillig, Karl W. and Paul G. Mahlberg. 2004. A Chemotaxonomic Analysis of cannabinoid Variation in *Cannabis* (Cannabaceae). **80-mile pollen spread** from Cabezudo, Baltasar, Marta Recio, José María Sánchez-Laulhé, María De Mar Trigo, Francisco Javier Toro and Fausto Polvorinos. 1997. Atmospheric transportation of marijuana pollen from North Africa too the Southwest of Europe. Atmospheric Environment. October. Vol. 31, Issue 20, pages 3323-3328. The North American Industrial Hemp Council (www.naihc.org) gives good coverage and links to the **fiber values of industrial hemp** and the challenges to U.S. recommercialization. On **medical marijuana** see the National Organization for the Reform of Marijuana Laws (www.norml.org). NORML is less credible on the subject of industrial hemp. For the **botany of *Cannabis sativa*** as well as corn and poppies and how **most "marijuana" seized in the U.S. is ditchweed**, see *Hemp and Marijuana: Myths and Realities* by Dr. David P. West (http://www.naihc.org/hemp_information/content/hemp.mj.html). The best general treatment of industrial hemp is John Roulac's *Hemp Horizons: The Comeback of the World's Most Promising Plant* (White River Junction, VT: Chelsea Green Publishing Company, 1997.). The best detailed summary is "Hemp: A New Crop with New Uses for North America, by Ernest Small and David Marcus (chapter in: Janick J. and A Whipkey (eds). 2002 Trends in New Crops and New Uses. ASHS Press, Alexandria, VA). **CBD being the antidote to THC** is documented in: Russo, Ethan (ed). 2003. *Cannabis: From Pariah to Prescription*. Hawthorne Press. New York; and Grotenhermen, Franjo and Ethan Russo (eds). *Cannabis and Cannabinoids: Pharmacology, Toxicology, and Therapeutic Potential*. Hawthorne Press. New York. **Marijuana growers won't want industrial hemp grown anywhere near them** (*High Times* vol. 287. July 1999, page 36) The **Controlled Substances Act** provision is at 21 U.S.C. §802 (16). We are indebted to Dr. Paul Mahlberg, Professor of Biology (plant biology) and Senior Fellow of the Institute of Molecular and Cellular Biology, Indiana University, for patiently explaining the basics of cannabis. Mahlberg has studied cannabis (with a license from the Drug Enforcement Agency) for over 30 years and has published over 30 articles on the subject. **DEA requirements for growing industrial hemp** from John Stahl (pers. comm. 8/13/03). For **states that have legislated in favor of industrial hemp**, see http://naihc.org/hemp_policy/state_updates_oct99.html. The proposed rulemaking petition to the Drug Enforcement Administration and U.S. Department of Agriculture filed by Ralph Nader's Essential Information on behalf of numerous parties is at <http://www.woodconsumption.org/alts/petition.html>. The **9th Circuit Court** of Appeals ruling is *Hemp Industries Assoc. v. DEA*, No. 03-71366 (No. 03-71603) (9th Cir. filed Feb. 6, 2004). The **Ecologist letter to the editor** may be found in the June 2004 issue.