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# CRS Report for Congress

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## Growing Marihuana (Hemp) for Fiber: Pros and Cons

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### Summary

Apart from being the source of an illegal drug, *Cannabis sativa* (hemp) has been for centuries a source of fiber used in the production of rope, canvas, clothing, and paper. Although some hemp production for fiber was permitted during World War II, growing hemp has been illegal in the United States since 1937. Recently, however, groups supporting hemp legalization have been arguing that the plant's potential as source of fiber, oil, and biomass for energy production could bolster weak farm economies in several States. As with any unconventional crop, some farmers might profit from growing hemp, but its economic benefit to the farm sector overall would likely be limited. The arguments in support of the plant's commercial uses are unlikely to change current Federal policy on hemp, since it can also be grown for use as a drug, and the U.S. Government is committed to strong antidrug policies and programs.

### Background

Hemp is one of a number of plants (sisal, jute, and abaca are others) from which commercially valuable fiber can be obtained. However, unlike most of these other plants, which are tropical or subtropical, hemp is well suited to growing conditions over much of the United States. It was widely grown as an agricultural crop from colonial times through the mid-1800s, and both fine and coarse fabrics, twine, and paper from hemp were in common use. However, by the 1890s, cotton was gaining as a source of clothing fiber, due to the development of labor-saving machinery for harvesting, and the demand for coarse natural fibers was increasingly being met by imports. U.S. hemp production for fiber declined significantly toward the end of the century and remained low through the 1930s.

U.S. Department of Agriculture (USDA) data going back to 1931 show that in the decade before the U.S. entrance into World War II, land planted to hemp nationwide averaged fewer than 1,000 acres annually. In addition to competition from other domestic and imported fibers, a growing disapproval of the plant's narcotic properties probably also dampened farmers' interest in

growing hemp. Between 1914 and 1933, 33 States passed laws that prohibited growing marihuana for anything other than medicinal and industrial fiber purposes.<sup>1</sup>

In 1937, Congress passed the first Federal statute regulating marihuana possession, the Marihuana Tax Act. This law restricted possession to those who could legally buy a tax stamp for it, namely, authorized medical and industrial users only. The Marihuana Tax Act was eventually superseded by provisions of Title II (The Controlled Substances Act) of P.L. 91-513, The Comprehensive Drug Abuse Prevention and Control Act of 1970, which made possession of marihuana illegal for any but a specially authorized experimental purpose.

Hemp fiber production remained at a relatively stable, low level until 1941, when the acreage planted for both fiber and seed production increased dramatically as a result of the war effort (hempseed oil can be used in paints and varnishes, and as a fuel). In 1943, at the height of U.S. involvement in World War II, 146,200 acres of hemp were harvested for fiber, with an additional 40,500 acres harvested for hempseed. One major reason for the need for increased domestic production was the termination of sisal shipments for rope and rigging from the Japanese-occupied Philippines.

By 1945, acres harvested for fiber and seed had dropped to 4,600 and 400, respectively. By 1952, no production data were reported, and USDA discontinued the hemp data series altogether in 1956. At the same time, records show that between 1952 and 1972, annual U.S. imports of synthetic fibers rose from 69.8 million pounds to 407.8 million pounds.<sup>2</sup> In more recent years, domestic synthetic fiber production from natural gas has increased substantially. It is generally acknowledged that the mass production of cheaper, stronger, and more uniform synthetic fibers had as much to do with the cessation of U.S. hemp fiber production as did the Marihuana Tax Act and unfavorable public opinion about the plant's role as a drug source. Hemp is still grown for fiber and seed in Asia, Central and Eastern Europe, France, and Italy.

### The Current Issue

Recent interest in making hemp once again a legal commodity has largely been spurred by the efforts of one promoter, Jack Herer, who released an updated version of his book, *Hemp and the Marijuana Conspiracy: The Emperor Wears No Clothes*, in 1990. The author argues that if hemp were adopted as a source of paper, cloth, and cordage; charcoal, methanol, and diesel fuel; edible and industrial oils; and protein for livestock and poultry (oilseed cake and hempseed), it could slow erosion, reduce pesticide usage, save the rainforests,

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<sup>1</sup> Bonnie, Richard J. and Charles H. Whitebread. *The Marihuana Conviction: A History of Marihuana Prohibition in the United States*. University Press of Virginia. Charlottesville. 1974. p. 51.

<sup>2</sup> *Commodity Year Book*. Commodity Research Bureau, Inc. New York. 1965, p. 271. 1975, p. 284.

preserve the ozone layer, and forestall global warming.<sup>3</sup> On a less ambitious scale, other supporters of hemp legalization argue that as hemp once was a valuable fiber crop, it could be again. Viewed this way, its economic potential would be similar to that of any alternative crop.

**Hemp as a fiber crop.** Federal research into the development of alternative crops, and alternative (nonfood) uses for established agricultural commodities, is not new. USDA has been supporting this type of research since the late 1930s. Currently, under the Critical Agricultural Materials Act of 1984 (P.L. 98-284), the supplemental and alternative crops provisions of the 1985 and 1990 omnibus farm acts, and other authorities, several million dollars annually go to State laboratories for research and development in this area.

Many of the alternative crops closest to commercialization -- for example, guayule, jojoba, kenaf, and winter rapeseed -- have many uses identical to those possible from hemp. None of them have the associated potential for use as a drug source. Even so, progress in bringing these alternative crops to full commercial use has been slow, and has required a continuing flow of Federal funds to overcome barriers.

Hemp as a fiber and oil crop would likely face the same barriers to commercialization as do the crops mentioned above. First, private industry generally pursues product and market development only for items whose potential earnings promise a return on their investment. Second, many of the potential (including industrial) uses for hemp fiber and oil are identical not only to those of other alternative crops, but also to those of major U.S. commodities, such as corn, soybeans, sorghum, and cotton.

Available USDA import data also show steady decline in the demand for all hard natural fibers. U.S. imports of abaca, jute, sisal (henequen), coir (coconut husk fiber) and hemp were 23.0 million metric tons (MMT) in 1990, compared to 52.5 MMT in 1980.<sup>4</sup> The *Commodity Year Book* discontinued reporting U.S. hard fiber imports in 1983. The explanatory text reads:

Most of the raw sisal and henequen imported into the U.S. in recent years have been used for padding and purposes other than the manufacture of twine. Imports of twine made with sisal and henequen baler and binder have declined in recent years, partly because of changes in hay harvesting

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<sup>3</sup> Certain groups are also calling for legalizing marijuana for medical purposes. For a discussion of this issue, see *Medical Use of Marijuana: Policy and Regulatory Issues*, CRS Report 91-875 SPR.

<sup>4</sup> U.S. Department of Agriculture. Economic Research Service. *Foreign Agricultural Trade of the United States*. Calendar Year 1980-1990 Supplements.

methods and partly because of the increased use of domestically produced synthetic fiber twines.<sup>6</sup>

**Hemp's environmental impacts.** The argument that hemp would be an environmentally benign crop is difficult to evaluate. Much would depend upon what purpose it was being grown for, and thus how intensively it might be cultivated. Proponents claim that one of hemp's advantages as an alternative crop is that it could be grown with little fertilization or cultivation on marginal land, or in semiarid climates where farmers' crop choices are limited.

Available literature tends to dispute these claims. One source states that "...it is generally recognized that deep, well-drained clay-loam soils containing considerable organic matter are most favorable for the growth of the crop...Hemp requires a plentiful supply of moisture throughout its growing season...Drought and high temperatures during the later stages of growth will hasten maturity and tend to dwarf the growth...[H]emp requires liberal fertilization for high fiber yields."<sup>6</sup> It does appear, however, that weeds, insects, and diseases do not pose a great threat to hemp, which might give it some advantages over standard commercial crops grown under conventional practices.

**Hemp as a drug source.** The argument that raising hemp for fiber or for biomass would increase its availability for use as a drug is also difficult to assess. Marijuana imports from Mexico account for 63 percent of the total U.S. supply. U.S. domestic production accounts for 18 percent.<sup>7</sup> The trend in domestic cultivation appears to be toward indoor and underground operations that use advanced agronomic practices--such as hydroponics and cloning--to enhance potency.

In contrast, hemp varieties grown for fiber vary greatly in potency, which could limit their feasibility as a drug source. Some varieties produce very little delta-9 tetrahydrocannabinol (THC), the plant's primary psychoactive chemical, and the varieties with the highest THC content are the poorest fiber producers.<sup>8</sup> Similarly, the cultivation practices for obtaining the maximum or highest quality fiber content may not promote optimum THC development in the leaves and flowers.

Plant breeding research could possibly transfer the low-THC characteristic into more commercial varieties. It could be argued that such research would not

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<sup>5</sup> *Commodity Year Book*. Commodity Research Bureau, Inc. Jersey City, N.J. 1983, p. 165.

<sup>6</sup> Dempsey, J.M. *Fiber Crops*. The University Presses of Florida. Gainesville. 1975. p. 46-89.

<sup>7</sup> *The Supply of Illicit Drugs to the United States*. Report of the National Narcotics Intelligence Consumers Committee. June 1991.

<sup>8</sup> Dempsey, p. 47-48.

necessarily be inconsistent with public policy: the Federal Government spends roughly \$5 million annually on research on tobacco, a commodity with acknowledged addictive and health-damaging properties. A portion of current tobacco research is focused on finding viable industrial (nonsmoking) uses for the plant--for example, as a source of environmentally safe biological compounds for use as pesticides and herbicides.

Nonetheless, it might be difficult to make a convincing case for similar research on hemp. Tobacco is an established commodity, and farmers stand to benefit directly from research to find new uses for it. The economic benefits to farmers from hemp research are much less clear.

**Conclusion.** Other possible benefits of commercial hemp cultivation, such as having a domestic source of hard fiber or an environmentally superior source of biomass fuel, are not very compelling under current U.S. policies that favor low-cost synthetic fibers of both foreign and domestic origin, and in light of the availability of established crops that can serve as alternative fuel feedstocks. However, these policies are always open to change in today's volatile global arena. It could be argued that research into hemp's many potential uses has strategic value. This argument has been used for more than 20 years to sustain research into developing a domestic source of rubber from the guayule plant for use in military aircraft tires.

The factor that currently makes consideration of hemp cultivation for fiber a moot point is the Government's strong antidrug policy. In addition to existing efforts, the Drug Enforcement Agency in 1990 launched the Domestic Cannabis Eradication and Suppression Program, which actively pursues the eradication of both potent cultivated plants and wild stands of low-potency marihuana in all 50 States.

Given U.S. antidrug policies, and the availability of established and alternative fiber and biomass crops, hemp is likely to remain an illegal crop for the foreseeable future.