

DETHRONING KING COTTON: ENVIRONMENTAL IMPACTS OF PRODUCING COTTON VERSUS HEMP

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Abstract

The U.S. is one of the largest cotton producers in the world, but its production raises many sustainability issues. Cotton consumes large amounts of water, chemicals, and is grown primarily in dry regions of the U.S. which leads to increased irrigation and loss of potential production. Is cotton a sustainable crop the United States should continue producing textiles with, or should it look into alternative options? All thirty industrialized countries in the world, except for the United States grow industrial hemp. Industrial hemp is an alternative that should be used in the United States instead of cotton because it has less negative environmental impacts and can be grown more widely in the United States.

Methods

Environmental impacts were determined through examination of government publications and journals. Possible areas of hemp production were determined from analyzing ideal growing conditions and areas in the U.S. which supported them. After examining government records and the government's involvement in hemp, analysis was done on the barriers and solutions of implementing a more sustainable option for the textile industry.

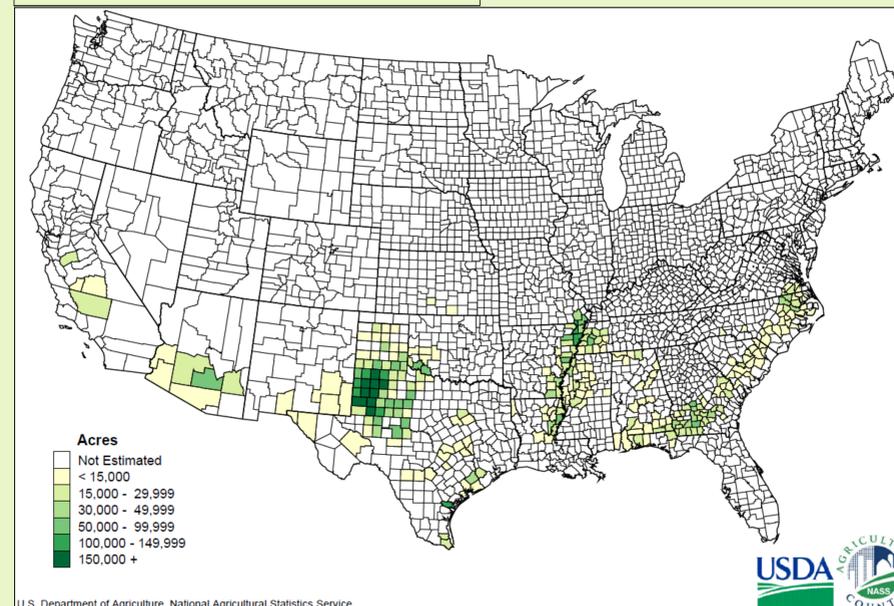
Environmental Impacts

	Cotton	Hemp
Water Demand		
Growing Season (inches)	30-36	20-28
To Produce 2.2 lbs (gallons)	2,609	561
Pesticides (lbs/acre)		
Herbicide	2.6	none
Insecticide	0.78	none
Fertilizers (lbs/acre)		
Nitrogen	84.3	little to none
Phosphate	29.2	little to none
Potash	36.7	little to none

Cotton requires temperatures between 60-90° F during its six to seven month growing season, while hemp requires temperatures of 60-80° F for a four month growing season. This means hemp can grow in northern states during the summer without being affected by the cold and frost that would kill the cotton plants. Hemp plants grow wildy, so this gives it an environmental advantage over cotton. Herbicide is not needed because the plant naturally grows tall and bushy, which repels other plant growth. Few

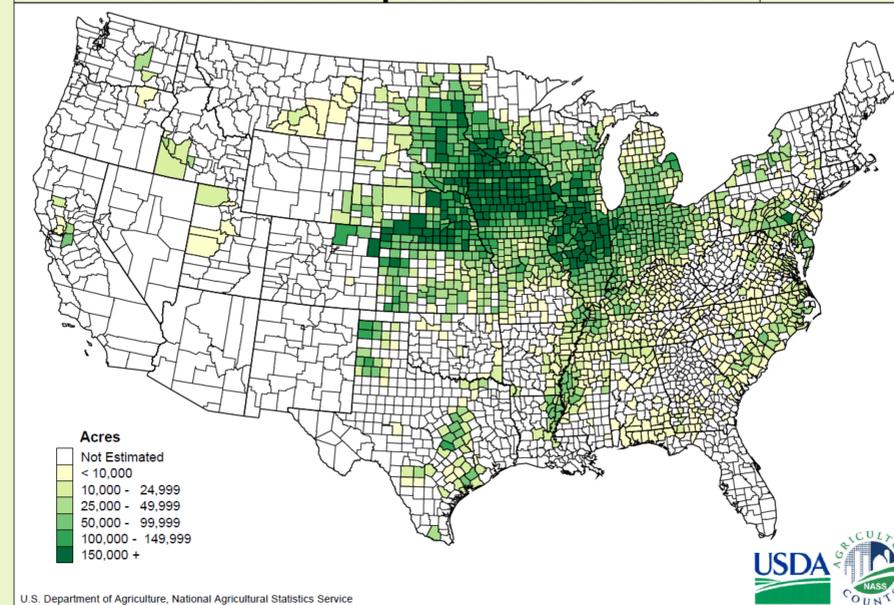
problems have been documented with insects destroying hemp fields in other countries and in the U.S. before hemp was regulated by the DEA, so insecticide is not needed.

Cotton Production in the U.S.



Cotton is produced in a small percentage of the U.S. and grown in less than ideal conditions. Texas is the largest cotton grower, but it is dry, which means natural rainfall will not supply its water demand and irrigation will have to be used.

Possible Industrial Hemp Production in the U.S.



This is a map of U.S. corn production. Corn and hemp have similar growing conditions (length of growing season, temperature and water needs), so hemp could be grown where corn can. A larger growing area means more product can be produced, and being grown in higher precipitation areas reduces irrigation.

Hemp's Barriers

Before hemp can be a viable crop in the United States, many barriers must be overcome.

- The Drug Enforcement Agency (DEA) classifies industrial hemp as an illegal drug even though it cannot give a person psychoactive feelings
- Education: Many people do not know the difference between hemp and marijuana
- Farmers would need new equipment
- Market: Presumably there would be a market because there is a market for cotton, and hemp could replace cotton in the textile industry

Results

Hemp is more sustainable than cotton because it does not demand as much water, and it requires less fertilizer, herbicides, and insecticides. Hemp can also be grown in more states than cotton, which means the textile industry would be able to produce more material. The best way to implement hemp into the textile industry is to slowly phase hemp into current production. If hemp slowly mixed into clothes with a shirt containing 90% cotton and 10% hemp, the textile industry could ease into producing products that are more sustainable. There are several barriers that need to be overcome before this can happen though. First the public needs to be educated on the benefits of producing industrial hemp and the distinction that hemp does not give the same psychoactive feelings as marijuana. Legislators need to be pushed by people to pass laws allowing hemp to be grown and to put pressure on the DEA, so hemp can be unclassified as an illegal drug in the United States. Research and development into efficient equipment also needs to be done to produce hemp at a comparable rate to cotton.

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