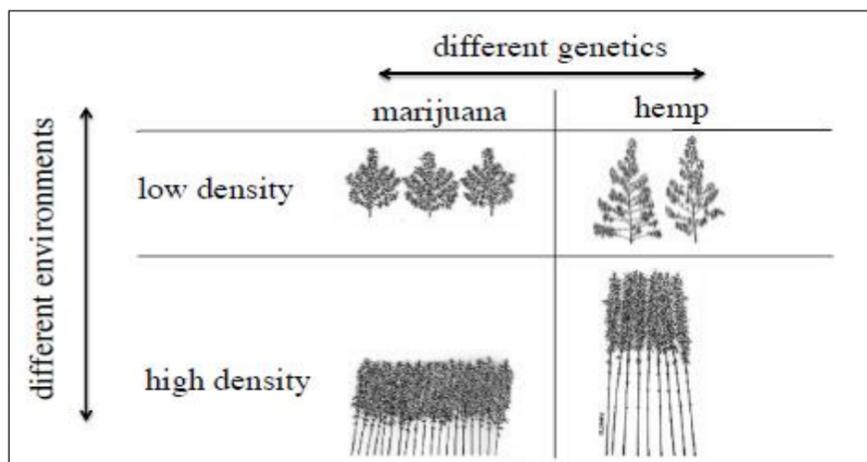


Industrial Hemp

- Used as a textile in clothing and manufacturing applications, automotive applications, building materials, food and oils, beauty products, paper, packaging, and plastic substitutes
- Low maintenance crop that can be grown in all climates
- Does not require herbicides
- Requires limited, if any, pesticides
- Varies in appearance from marijuana, with different growth rates, and different growth cycles
- Successful marijuana crops (high TCH) cannot be grown in the same fields as successful industrial hemp crops (little to no TCH)
- Uses 50% less land than cotton to produce the same yield (tons), with the same industrial applications
- Uses 50% less water than cotton, and 75% less water than corn to produce the same yield (tons).

Figure 1. Trait Variation in Cannabis Phenotype
(marijuana and industrial hemp)



Industrial Hemp

Per the Hemp as an Agricultural Commodity (CRS 7-5700), "...industrial hemp and marijuana are from the same species of plant, *Cannabis sativa*, but from different varieties or cultivars that have been bred for different uses. However, industrial hemp and marijuana are genetically distinct forms of cannabis that are distinguished by their use, chemical makeup, and differing cultivation practices in production" (Johnson, 2018, p.1).

Growing practices for industrial hemp differ from the varieties with high levels of THC used in recreational or medicinal drug use (marijuana). Industrial hemp produces fibers and seeds, for which are used in the, "...agriculture, textiles, recycling, automotive, furniture, food and beverages, paper, construction materials and personal care," sectors (Johnson, 2018, p. 2). Industrial hemp used in fiber production needs to be tall, and slender to produce a continuous, fine, fiber (Ecological Footprint and Water Analysis of Cotton, Hemp, and Polyester, 2005) (Johnson, 2018). This plant takes on an appearance similar to corn or wheat, and has few leaves on the stalk, below the tip of the plant. Whereas, varieties grown for psychoactive results are produced to be more bush-like, with many leaves. In addition to the physical appearance, these plants are grown in different cultivation environments, and on different growth cycles. Although industrial hemp can be produced in nearly all climates, marijuana is not as easy to cultivate and thrive in outdoor fields. If plants intended for drug use and industrial use were to be raised in nearby plots, cross-pollination would likely result in an unusable crop with low TCH levels (Johnson, 2018).

Economic Development

The CRS 7-5700 Report for Congress stated that the United States imported \$67.3 million in hemp products in 2017 (Johnson, 2018). Making hemp into a viable crop would require additional infrastructure in the State of Kansas, and efforts to establish a new agricultural supply chain. As a single hemp plant has multiple applications (for example, the inner core of the stalk is a natural building material, the outside stem can be used to produce fine fibers, and the seeds are of use to the beauty and food industries) there is also a need for more advanced harvesting, processing, and manufacturing technologies. Capitalizing on this supply chain in an economically and environmentally sustainable manner could create socially sustainable rural development in Kansas.

Environmental Impact

There are clear environmental advantages when comparing the environmental impact of hemp and cotton production. Hemp fiber can be produced with 50% less water, and 50% less land than cotton fiber (Ecological Footprint and Water Analysis of Cotton, Hemp, and Polyester, 2005). Hemp also does not require the use of herbicides and does not have known pest related issues. The elimination of herbicides and pesticides, needed to produce cotton, would, in turn, decrease the number of toxic chemicals entering the soil, water, and air in Kansas. Also, hemp production does not strip the ground of nutrients, a common issue with cotton production (CRS Report for Congress), and as such, the land used to produce the fiber is regularly available and viable to continue to produce crops without the need for crop rotation. Overall, hemp is a low maintenance crop with a wide variety of applications across, and outside of the apparel and textile industry.

References

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