

# Scaling Up the Industrial Hemp Supply Chain as Carbon Negative Feedstock for Fuel and Fiber



Partnerships for Climate-Smart Commodities

Sustainable Aviation Fuel (SAF)

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1890 Historical Black College  
and University (HBCU)

# Hemp provides an unparalleled opportunity towards solutions for lowering the carbon intensity of fuel

## Industrial Hemp:

**Conservation Crop Rotation** in major Corn, Soybean growing Regions

Illinois, Iowa, Minnesota, Soybeans

Iowa, Illinois, Nebraska, Corn

**Cover crop** well suited in Hard Red Winter Wheat (HRWW) Growing Regions

Kansas, Oklahoma, Texas, Washington, Colorado, Nebraska

~20M idle acres available-summer fallow is not utilized for food production

Focus of Climate Smart Grant

Hemp genetics can yield substantially greater amounts of oil per acre than commonly grown oil seed feedstocks

- Amplify from New West Genetics can yield at least 80 gallons of oil per acre
  - Frost Tolerant hemp, planted on summer fallow land in Feb harvested in July and ground is ready for winter wheat planting in Sept
  - Grow non-food oil seed crop on idle farmland
- Hemp can be the highest yielding oil non-food crop planted in the US!



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# Hemp is an ideal annual crop for carbon negative supply chains for fuel.

## Industrial Hemp:

- Hemp has lower N requirements and create deeper, more massive root systems that can make annual biomass feedstock production C negative (Paustian et al. 2016)
- Using annual cropping systems for soil C sequestration is the least expensive and most environmentally friendly, with near-term technological readiness to go to scale
- Adoption of hemp crops with enhanced root phenotypes in annual cover crop and conservation cropping systems is one of the most promising and scalable technologies
- Hemp's massive root system encourages efficient water utilization when compared to corn, the deep and extensive root mass allows and encourages efficient utilization of existing soil nutrients.
- Hemp has another key trait for C sequestration, population density, where > 500k individuals per hectare leads to more root systems and greater C input and deep root mass stores CO<sub>2</sub> in the soil
- Genetically enhanced roots will improve soil function, soil health and agroecosystem sustainability and resilience and will contribute to other environment benefits (e.g., water quality)

# Action items to grow Hemp as a Purpose Grown Energy Crop

## Steps for Hemp as a preferred Energy Crop

1. Implement Climate Smart Energy Grant, “Scaling Up the Industrial Hemp Supply Chain as Carbon Negative Feedstock for Fuel and Fiber”
  - a. \$5M 3-year grant focused on limited acres in Missouri-
  - b. Focus on cropping systems, genetics for maximizing grain and fiber production with root structures to sequester carbon.
  - c. Designed to minimize GHG emissions and to maximize C sequestration with minimum water and fertilizer inputs.
  - d. Utilize fiber for building materials and other best uses.
2. Need to expand grower participation in the corn belt and HRWW growing regions
  - a. Meeting scheduled with Colorado NRCS to develop a strategy to utilize the increased funding opportunities for increased Hemp production. (IRA funding)
  - b. NRCS and DOE should collaborate to enhance growing strategies for Purpose-Grown Energy Crops for SAF
3. Govt Program funding from DOE and USDA to create regional processing centers which extract oil from seeds and fiber
  - a. Climate Smart Grant did not allow for processing investment
  - b. Govt investment can attract private capital partnership
  - c. Oil is sent to SAF refinery and then into supply chain

