

Benefits of Hemp (*Cannabis* sp.) as an Industrial Crop

- Currently, 21 states may grow hemp per Sec. 7606 of the Farm Bill
- Estimated 2014 retail value of hemp products sold in the U.S. - \$620 million
- Hemp requires less herbicides or pesticides.
 - Dense planting prevents sunlight from reaching weed species in the undergrowth.
 - *Cannabis* sp. are of Asian origin. There are few native insect pests.
- Hemp has a deep fibrous root system.
 - Drought tolerant.
 - Accumulates biomass in soil zones where mineralization is limited and consequently carbon is sequestered for longer times.
 - No-till farming of hemp will sequester approx. 1125 kg/hectare (1000 lbs/acre) of carbon per year
 - Has a larger production of fine roots compared to wheat, cotton and sorghum and maize.
 - More efficient water and nutrient uptake.
 - Controls erosion of the topsoil.
- Hemp can be grown in a wide range of latitudes and altitudes.
- Hemp seed contains 30-35% oil by weight
 - Oleic acid (C18:1 Δ^9 ; ω -9 fatty acid), Linoleic acid (C18:2 Δ^9, Δ^{12} ; ω -6), α -Linolenic acid (C18:3 $\Delta^9, \Delta^{12}, \Delta^{15}$; ω -3), γ -Linolenic acid (C18:3 $\Delta^6, \Delta^9, \Delta^{12}$; ω -6) and Stearidonic acid (C18:4 $\Delta^6, \Delta^9, \Delta^{12}, \Delta^{15}$; ω -3)
 - Linoleic acid and α -linolenic acid are the only two fatty acids considered essential to human health.
 - Only current natural food source of γ -Linolenic acid.
 - 15% of human population may benefit from γ -Linolenic acid supplements to their diet.
 - More palatable than fish or flaxseed oils.
 - Most economic and environmentally-friendly source of these fatty acids.
 - Drying oil used to make paints.
 - Used to make biodiesel.
 - Hemp-based cosmetics and personal care products account for about half of the world market for hemp oil (\$200 million in US alone)
- Hemp seed contains 25-35% protein
 - Contains all eight essential amino acids in sufficient quantity for good health.
 - Meal is a valuable human and animal feed.
 - Food products include non-dairy milk and shelled seed.
- Hemp is can be made into many eco-friendly industrial products
 - Plastics, including car parts.
 - Papers.
 - Fiberboard and Insulation.
 - French houses have been made with materials entirely sourced from hemp.
 - Rope and textiles.
- Hemp can be grown more than once per year, or used in rotation with conventional crops.
 - Can restore compacted soils.
 - Reduces nematode populations in soils.