

Industrial Hemp @ K-State

Trying To Fill The Research Void

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John C. Pair Horticultural Center

K-STATE
Research and Extension



2019 Industrial Hemp Pilot Research Program

- Generated a rush of excitement in new & experienced farmers
- Need for unbiased, research based information



K-State's Role in Industrial Hemp

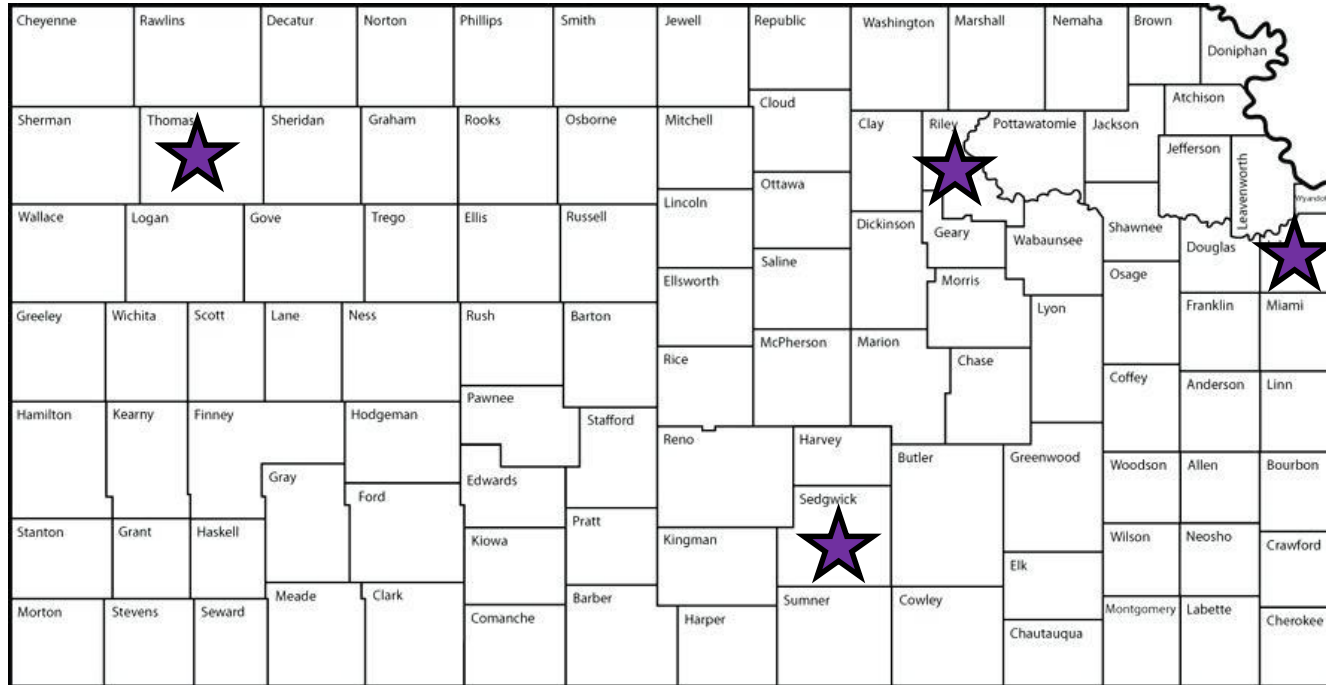


- Research, Extension, & Teaching
- Production
- Improvement
- BMPs



- Education

- We have just completed 1st grow

K-State's Role in Industrial Hemp



Botany of *Cannabis sativa* L.

- Wind-pollinated summer annual.
 - Grain & Fiber: Pollen = 
 - CBD Hemp: Pollen = 
- Can be dioecious (normally) or monoecious (occasionally).
- Strongly photo-period sensitive
 - Flowers when days begin to shorten, regardless of size
 - Fall or Winter = Lights



K-State's Role in Industrial Hemp

- Grain & Fiber
- Variety Trials
- 17 varieties
- Strong Genotype x Environment



Grain & Fiber vs. CBD

- Seed
 - Male & female plants
 - Pollen is necessary
 - Rarely go 'hot'
 - Grain or Stem is harvest
 - Agronomy Crop
- Clones (feminized seed)
 - Female only
 - Pollen is mortal enemy
 - Potential to be 'hot'
 - ♀ flowers harvested
 - Horticulture Crop

Grain & Fiber

- Grain
- 30 #/A approx. ½” deep
- Harvest @ 75% mature
- Harvest w/ combine
- Dried to 8% for storage

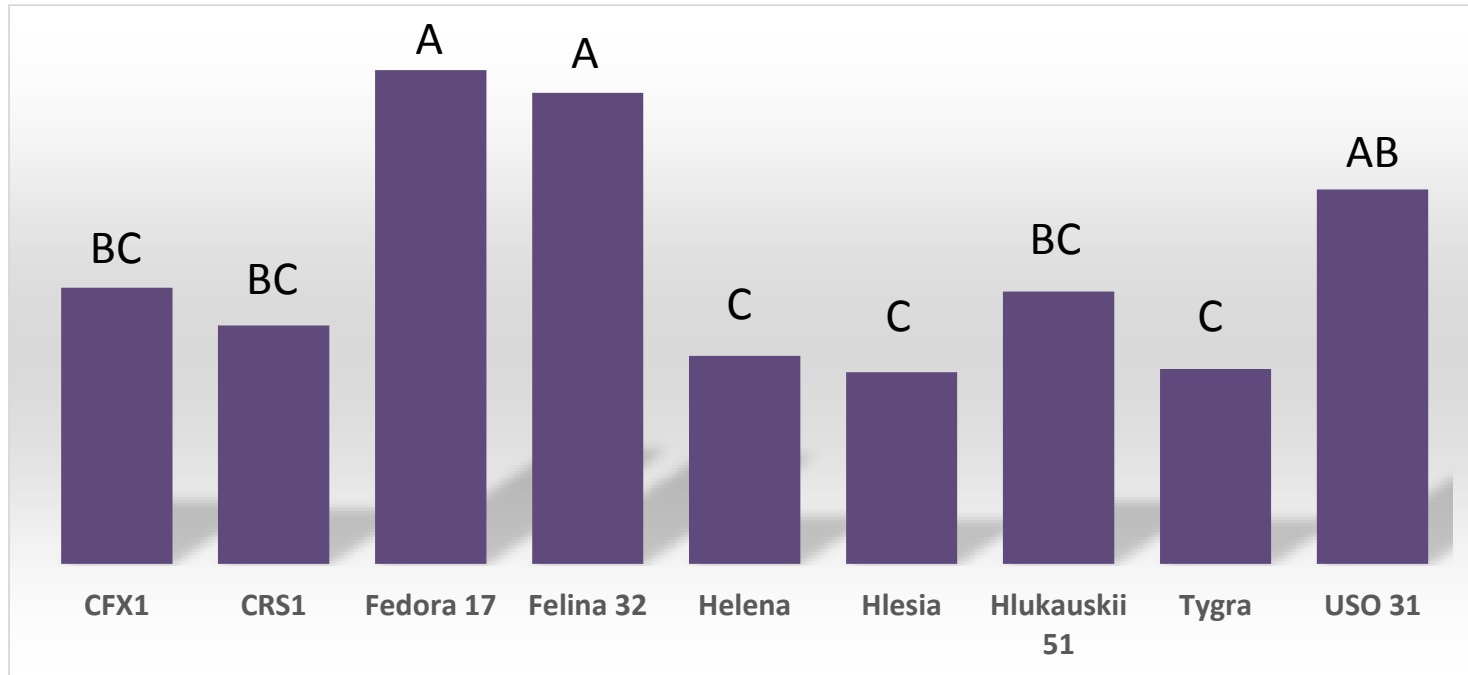


Grain & Fiber

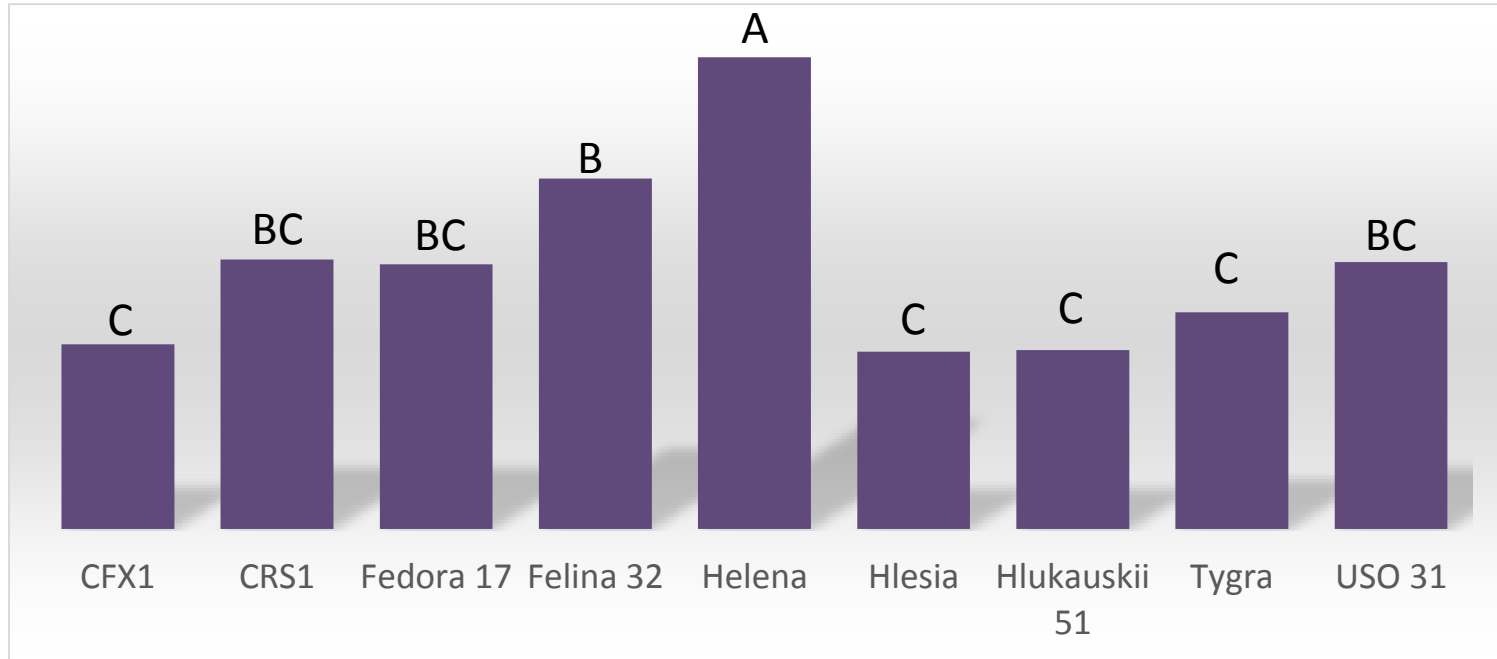
- Fiber
- 60 #/A approx. ½” deep
- Harvest when male senesce
- Swather (or sickle) to cut & retting for 2-3 wks
- Bale @ 15% moisture



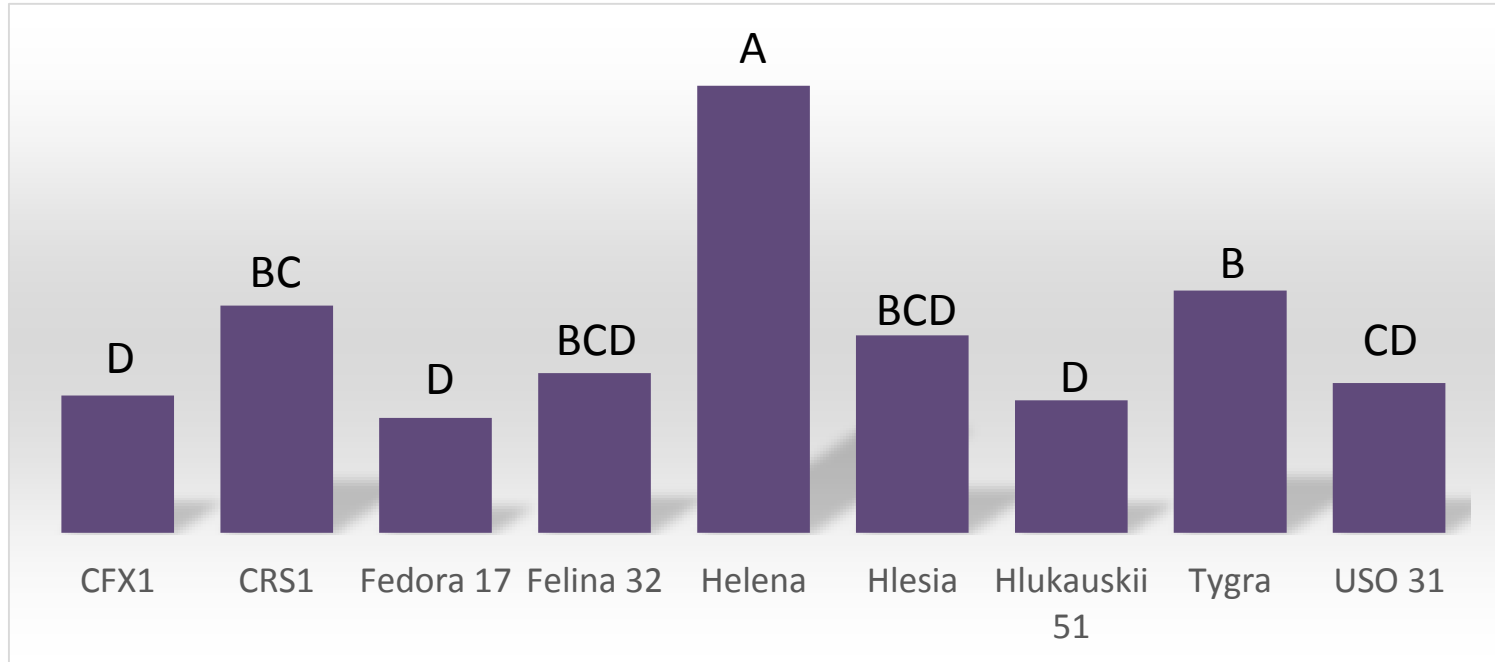
Grain – Plant #/m²



Grain Weight (g)/m²



Grain Weight (g)/plant



USO
31

Katani

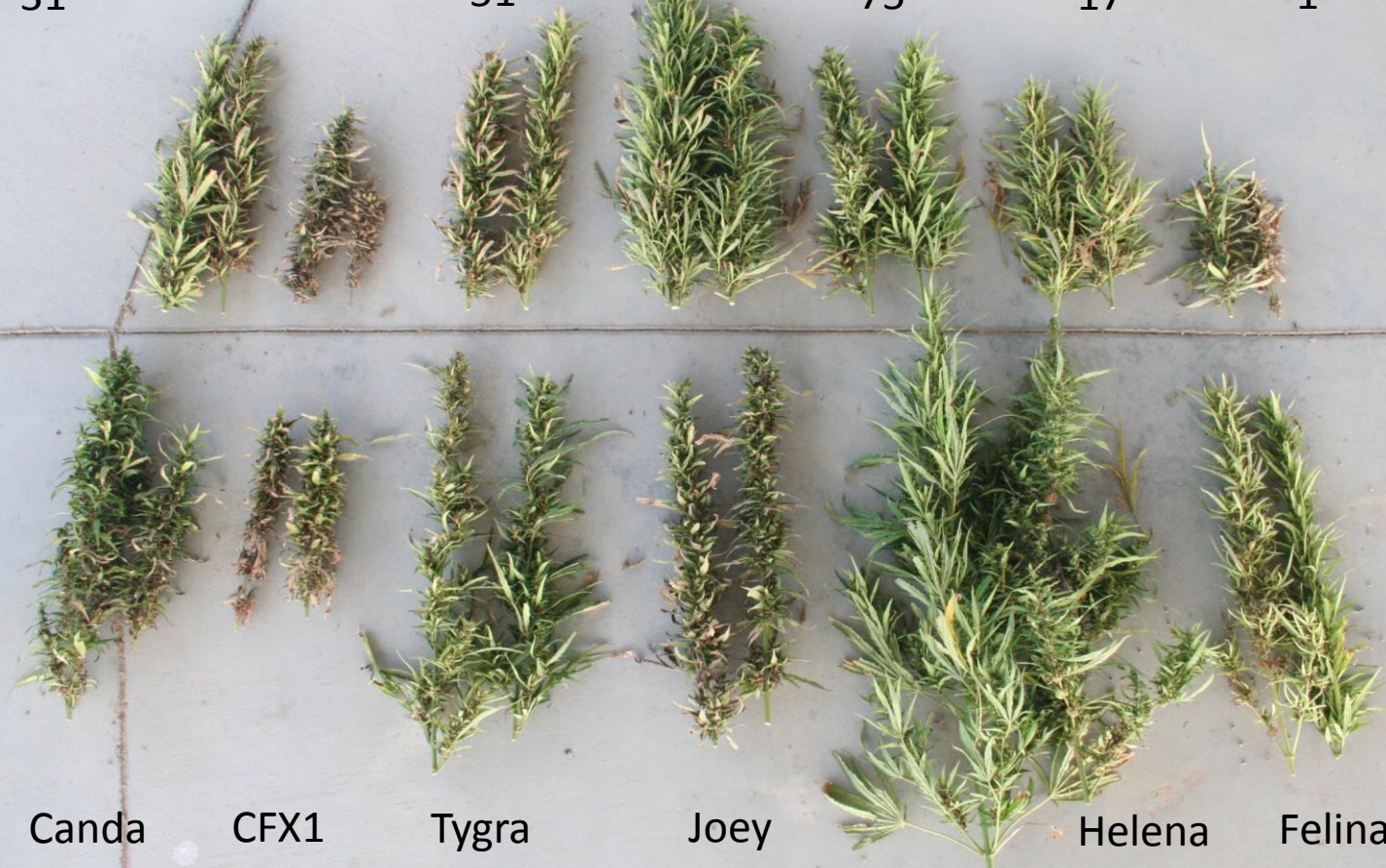
Hlukauskii
51

Hlesia

Futura
75

Fedora
17

CRS
1



Canda

CFX1

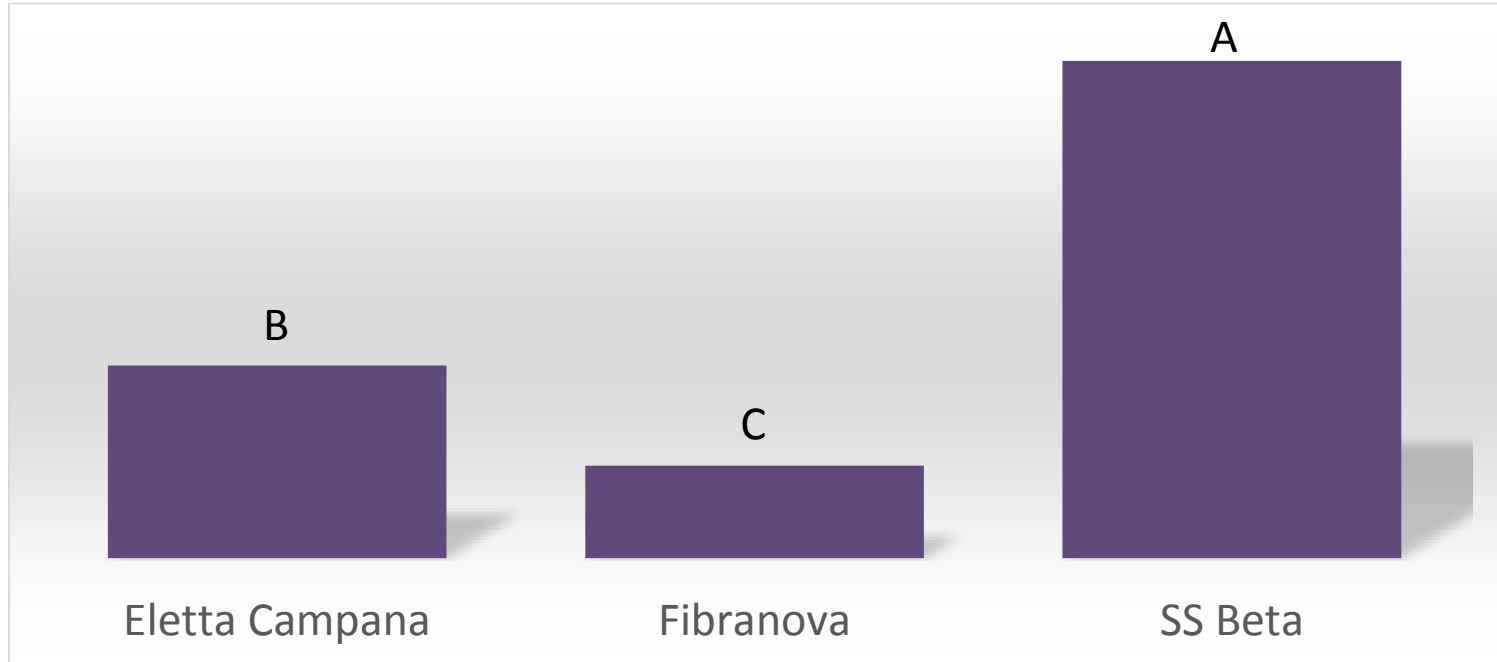
Tygra

Joey

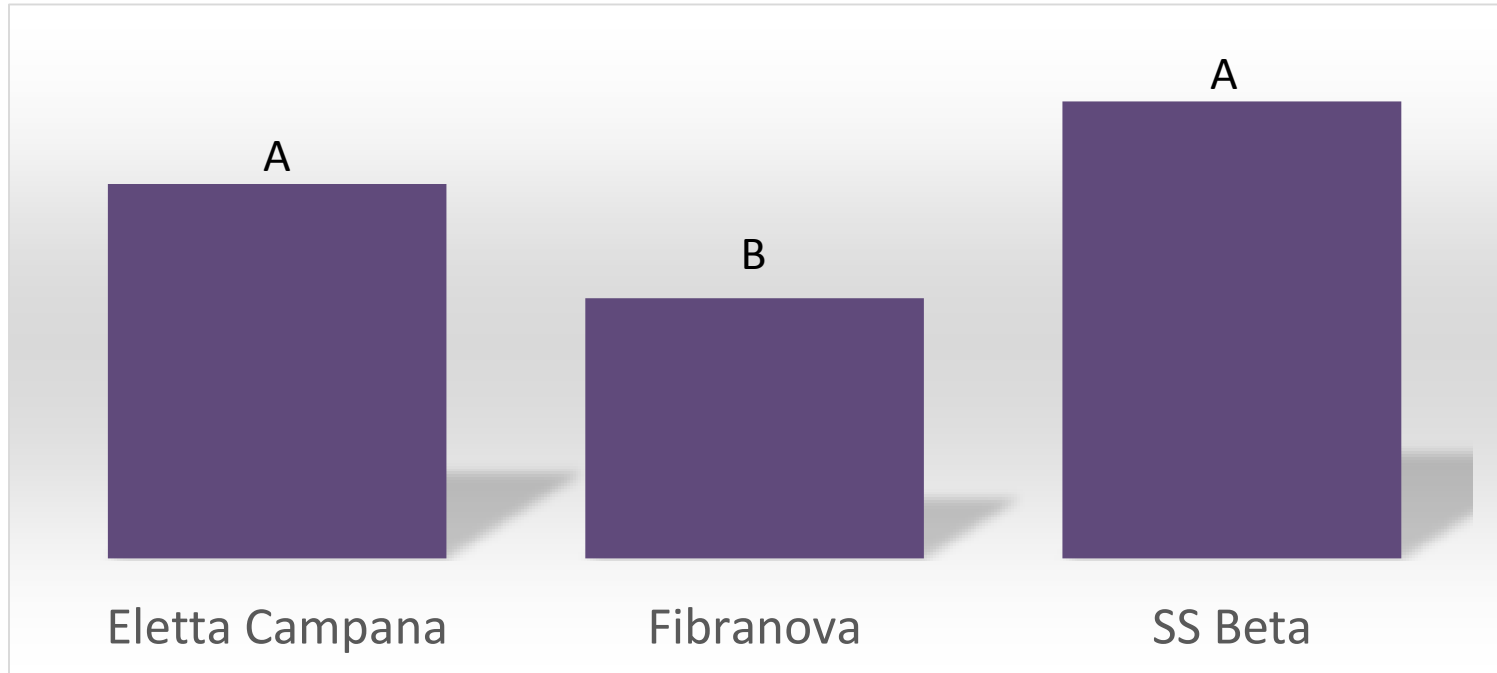
Helena

Felina 32

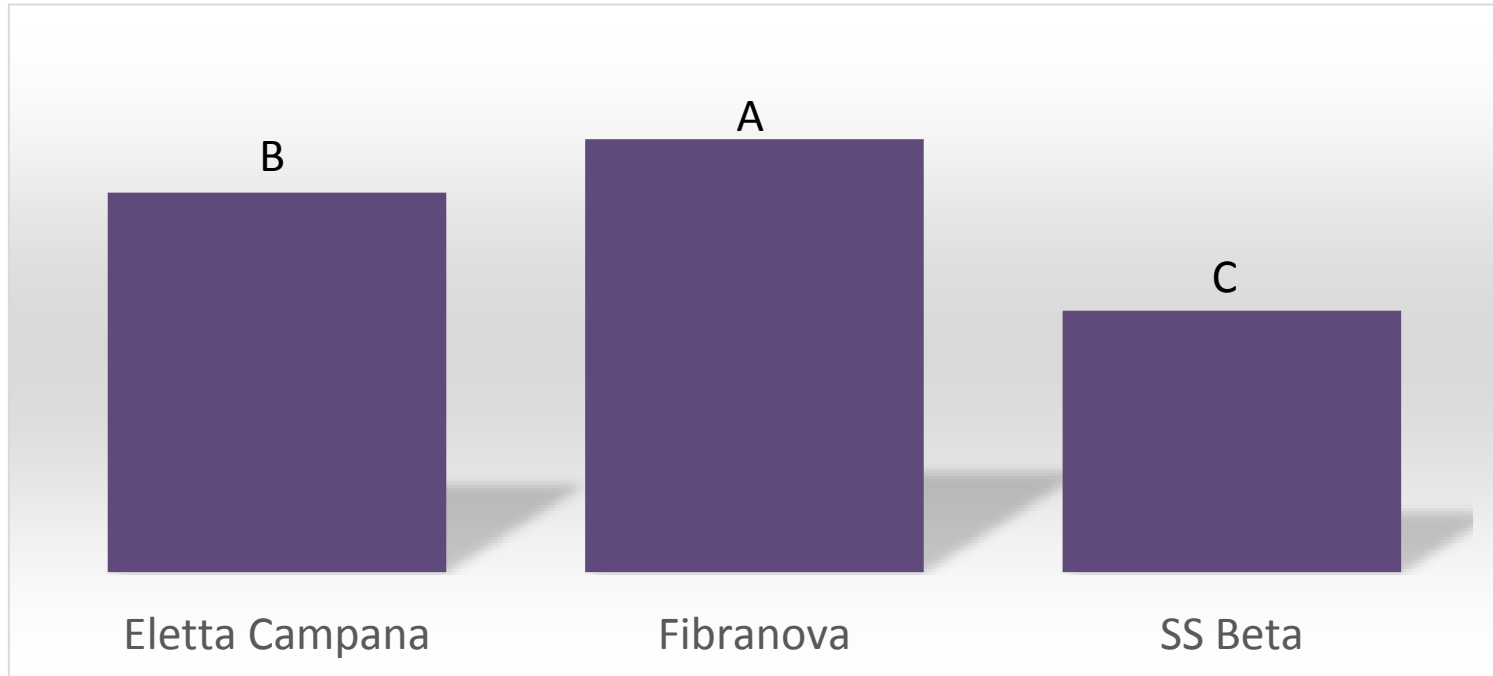
Fiber – Plant #/m²



Fiber – Stem Dry Wt. (g)/m²



Fiber – Stem Caliper (mm)



Pests?

- Spotted Cucumber Beetle
- APHIDS
- APHIDS
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- Lepidoptera Larvae
- Eurasian Hemp Borer
- Army worm
- Russet Mites
- Botrytis
- Powdery Mildew
- APHIDS
- Stem Girdling Roots









K-State's Role in Industrial Hemp

- CBD
- Variety Trials
- High Tunnel production
- Greenhouse production
- CBD vs THC content
- High CBD varieties and THC



Male vs. Female Plants







CBD Variety Trial

- 7 Varieties
- Organic v. Conven. Fert.
- Container v. Fabric Bag
- High Tunnel v. Outdoors



Industrial Hemp

- **CBD**

- Grown just like marijuana
- Flower is processed for essential oils
- Smokable CBD is popular **in other states**
- Varieties: AC/DC, Cherry, Otto II Endurance, Otto II Franklin, Otto II Stout, Super CBD, and The Wife
- Nearly everyone in KS is growing for CBD



Industrial Hemp

- **Future Work**

- Plan to continue this line of work
 - Water utilization
 - Production practices
 - Variety evaluations
 - Human Health
 - Animal Nutrition
 - Helping KS farmers be more successful
- Partnerships
 - Industry
 - K-State Vet School
 - USDA Multi-State working group



CRAIGER Enterprises