

# K-STATE

## Research and Extension

February 11, 2021  
S1084 Multistate Industrial Hemp Meeting  
Kansas State Report

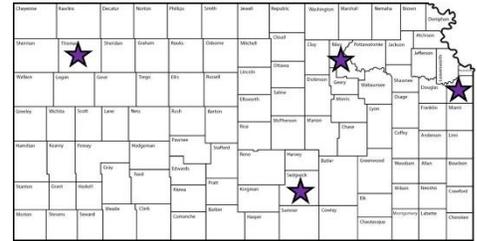


Figure 1. Research locations across KS.

### Industrial Hemp Research & Extension Team (\*S1084 Participants)

- \*Jason Griffin Professor & Director, John C. Pair Horticultural Center, Dept. Horticulture & Natural Resources
- \*Benjamin Schwab Associate Professor, Dept. Agricultural Economics
- Cary Rivard Associate Professor & Director, Olathe Horticulture Center, Dept. Horticulture & Natural Resources
- Donghai Wang Professor, Dept. of Biological and Agricultural Engineering, Carl R. Ice College of Engineering
- Eleni Pliakoni Associate Professor, Dept. Horticulture & Natural Resources
- Hans Coetzee Professor, Head - Anatomy & Physiology, College of Veterinary Medicine
- Kraig Roozeboom Professor, Dept. of Agronomy
- Lucas Haag Associate Professor, Dept. of Agronomy
- Michael Kleinhenz Assistant Professor, College of Veterinary Medicine
- Weiqun Wang Professor, Dept. Food, Nutrition, Dietetics and Health, College of Health and Human Sciences
- Yonghui Li Assistant Professor, Dept. of Grain Science and Industry

### Hemp Activities:

S1084 Dual Purpose Variety Trial was planted in Colby, Manhattan, and Wichita in early June. Unfortunately, the Colby location was terminated shortly after germination due to extensive hail damage. Manhattan and Wichita locations were successful, harvested, and data collected. Report can be found [here](#) shortly.

A study to investigate Water and Nitrogen use on two dual purpose varieties was planted in Colby, Manhattan, and Wichita in early June. Unfortunately, the Colby location was terminated shortly after germination due to the same hail storm. Both Manhattan and Wichita locations were able to complete the season, harvest, and collect data. A full report will be posted [here](#) shortly.

Projects to study CBD Hemp Production in High Tunnel Systems were conducted in Olathe and Wichita during summer 2020. In Wichita the emphasis was to study the influence date of planting had on ultimate plant size, yield, and cannabinoid content of high tunnel and open field production. A report will be available [here](#) soon. In Olathe, the emphasis was to investigate the effect of high tunnel and open field production systems on yield and cannabinoid content.

In Wichita an observational study to assess the effectiveness of ZeroTol to control powdery mildew and botrytis on CBD hemp during a summer greenhouse production was completed. Fogging the greenhouse 4 nights a week with a dilution of ZeroTol with a herrmidifier effectively controlled both diseases.

Mining the [data from the first year](#) of production of industrial hemp led to a publication in Western Economics Forum. It covers data regarding licenses, acres produced and harvested, and some hurdles growers encountered. It can be found [HERE](#).

A group collaboration with Horticulture, Agronomy, Biological and Agricultural Economics, and Human Nutrition has spent considerable effort investigating [hemp for food and biofuel](#) applications. For food application, we studied 1) the physical properties of hempseed including the measurement of kernel density, test weight, 1000-kernel weight, kernel hardness, single kernel weight, and kernel size; 2) chemical composition of hempseed including oil, protein, starch, ash, and cruder fiber contents; 3) the fatty acid composition including 37 fatty acids; and 4) antioxidant properties of hempseed protein. For biofuel application, we verified industrial hemp biomass is excellent feedstock for biofuel. Plant material for this work was harvested from the S1084 dual purpose variety trial.

Another collaborative group with Horticulture and College of Veterinary Medicine has been investigating the potential for industrial hemp as a [food source for cattle](#). The group has looked at the nutrient content, digestibility, and cannabinoid content of different components of the hemp plant. That publication can be found [here](#). They have also investigated the plasma pharmacokinetics of cannabinoids and their metabolites in cattle after oral feeding events. Look for that publication [here](#). Further work with other animals is also planned. Plant material for this work was harvested from the S1084 dual purpose variety trial.

The Post-harvest Physiology Lab in Olathe has been conducting hemp [lab testing services](#) for two years. In 2020 they expanded their services to a 16 cannabinoid panel and terpene analysis. They have processed samples for 22 different growers from multiple states as well as the K-State research samples and issue COAs as requested. Their research includes investigating extraction and processing procedures prior to cannabinoid determination to elucidate how sample handling influences cannabinoid content reported. They are also conducting post-harvest packaging research to preserve storage quality.

The Kansas Department of Agriculture submitted its plan and received approval to move forward with a commercial hemp program. As of January 2021 no more research licenses will be issued as the state moves to the commercial production of hemp. In 2020 there were 257 licenses issued, which was an increase of 3 licenses from 2019. There was just under 4,000 acres planted in 2020, which was a 42% increase from the previous year.