

## Standard Trials for Industrial Hemp Varieties in Kentucky-2018

D.W. Williams, J. Wade Turner, Robert Hounshell, David Neace, and Tom Keene

University of Kentucky

Agronomic Industrial Hemp Research

**NOTE:** There are no direct costs to owners of varieties for this work. However, gifts to the UK Industrial Hemp Agronomic Research Program are genuinely and deeply appreciated, and will contribute directly to the administration of this work (e.g., travel expenses among locations). A \$1000 gift can be made very simply at <https://uky.networkforgood.com/causes/11297-hemp-research-gifts-fund>.

Unbiased, science-based data on varietal performance in Kentucky is imperative for farmers to make informed decisions leading to optimized yields from hemp crops. Our research program will conduct two standard variety trials providing data to support information-driven decisions by owners of germplasm and producers; a dual-purpose trial and a fiber-only trial. Trials will commence in May 2018 and will conclude at various times in autumn. All trials will be conducted concurrently at three locations: the UK Agricultural Experiment Stations at Versailles in Woodford County (C. Oran Little Research Farm), at Princeton in Caldwell County, (UK Research and Education Center Farm), and the UK Agricultural Sub-Station at Quicksand, Breathitt County, KY (RCARS Farm). Each variety will be planted on three separate dates: 1 May, 1 June, and 1 July (+/- 5d at each location). Each planting date will be an independent study. Although not statistically supported due to experimental design (randomized complete block with 3 replications within planting dates), this will allow for insights into genotype X planting date interactions. Plot size will be 8'x15'. Fertility will be 60 lbs. N/A for fiber-only production and 100 lbs. N/A for dual-purpose production applied via urea (46-0-0) during pre-plant cultivation. Phosphorus and potassium will be applied pre-plant and as needed per soil test results to provide availability of 60 and 300 lbs/A, respectively. The soil reaction (pH) will be adjusted as needed to 6.5. Seeding rates will be 60 pounds seed/A for fiber-only trials and 30 pounds seed/A for dual-purpose trials. Plots will be seeded following conventional tillage using the Mundell customized hemp plot drill on 8" centers (rows).

Harvest dates for varieties will be determined based on visual observations of physiological maturity for the harvestable component of interest. More specifically, harvests for fiber-only will commence when a mean visual evaluation of 20% flowering occurs averaged across the 3 replications of a variety within planting dates and locations. Grain harvests will commence when a mean visual estimation of 75% seed maturity (bracts are open) occurs across the 3 replications of a variety within planting dates and locations. These harvest date parameters are subject to a margin of error based on environmental conditions and locations. Straw from dual-purpose trials will be harvested immediately following grain harvests. Fiber and grain harvests will be conducted manually. Harvests for data collection will consist of 2, randomly selected 1m<sup>2</sup> subsamples from each plot avoiding plot borders. Both grain and fiber will be air-dried indoors prior to data collection. Fiber will be evaluated as yields of total dry matter (tons per acre) from both fiber-only and dual-purpose crops. Grain will be evaluated as dry grain yield (pounds per acre) after thorough manual cleaning. Additional parameters to be measured in all trials include mean plant density (PD; plants per square meter), mean stem length (SL; inches) and mean stem diameters (SD; mm).

Data from each trial (fiber-only and dual-purpose and planting dates) will be analyzed separately using PROC ANOVA of SAS. Data among locations will be reported separately. Means will be separated by F-protected LSD at  $\alpha=0.10$ . A full report including all data from these trials will be posted on the UK Industrial Hemp Agronomic Research Program website: <http://hemp.ca.uky.edu/>.

**How to Enter Varieties:**

Seed already located in Kentucky and held by an Industrial Hemp Research Pilot Program participant can be provided to D.W. Williams by prior arrangement (contact information below). Seed already located in the U.S. but in a different state must be shipped to the KDA via the *Domestic Seed Request* form. Seed imported from outside the U.S. must be shipped to the KDA after approval through the *International Seed Request* form. Sponsors must complete parts 1, 2 and 3 of the domestic form, and/or parts 1, 2, 3, and 4 of the international form. Both forms are provided as attachments to this notice.

***Please complete the registration sheet below and submit by email (preferred: [david.williams@uky.edu](mailto:david.williams@uky.edu)) or by U.S. mail to:***

D.W. Williams  
UK Robinson Center  
176 Robinson Road  
Jackson, KY 41339

**UK 2018 Industrial Hemp Variety Evaluation Registration Sheet**

**Sponsor Name**

Company or individual name:

Company representative's name (if not an individual):

**Physical address**

Street:

City, State, Zip:

**Contact information**

Email address:

Telephone number:

Please provide a minimum of 8 pounds of seed per entry for fiber-only trials and/or 4 pounds of seed per entry for dual-purpose trials. This assumes a minimum germination percentage of 80%. Please be sure to accommodate pounds of seed for varieties entered into both trials.

Variety name or designation	Commodity purpose (fiber, grain, dual-purpose)	Pounds of seed supplied	Germination percentage (if known)

Seeds imported from other U.S. states must be accompanied by a KDA *Domestic Seed Request* form (complete/provide information for items 1, 2 and 3 on the KDA form).

Seeds to be imported from outside the U.S. will require an *International Seed Acquisition Request* form to arrange for a DEA import permit (complete/provide information for items 1, 2, 3, and 4 on the KDA form).

All imports to Kentucky regardless of origin must be shipped to: Kentucky Department of Agriculture  
Industrial Hemp Program  
ATTN: UK Variety Trial  
105A Corporate Drive  
Frankfort, KY 40601  
502-782-4113

Questions: Contact D.W. Williams: [david.williams@uky.edu](mailto:david.williams@uky.edu)



## Kentucky Department of Agriculture

### 2018 Domestic Seed/Propagule Request Requirements

#### **Compliance with Federal THC Threshold**

License holders must use only seed, propagules, or plants that are demonstrated to conform to the 0.3% delta-9-THC threshold. Documentation of measured THC levels shall be submitted to KDA with this request. Documentation shall also include the name, address, email, and telephone number of both the lab, and the seed source. Seed, propagules, or plants from outside of Kentucky which are not reviewed and approved by KDA are prohibited from use in Kentucky. Any license holder found using seed, propagules, or plants not reviewed and approved by KDA may be subject to revocation of the *Licensing Agreement* in addition to any civil or criminal liabilities that may exist.

#### **Intellectual Property**

License holders are prohibited from growing for replication any intellectual property or genetic lines for which they do not have a license or written permission from the property owner. A copy of any license or permission from the property owner shall be provided in writing to KDA upon request. The Department shall not approve a *Domestic Seed/Propagule Request* form unless the License Holder affirms in writing that the Licensee's planned activities will not infringe on the intellectual property rights of any person.

#### **Domestic Seed and/or Plant Acquisition (from within the United States)**

All seed and/or plants sourced from within the United States, but outside of Kentucky, must be pre-approved by KDA. License holders shall submit the *Domestic Seed/Propagule Request* form to KDA **at least three (3) weeks in advance of any proposed transfer of materials.**

The seed and/or propagule source must be a participant in a "duly recognized § 7606 Program," i.e., an institute of higher education or an individual or company permitted, licensed, or contracted by another industrial hemp research pilot program being conducted under the authority of 7 U.S.C. § 5940.

It is the license holder's responsibility to ensure that the transfer or sale of any industrial hemp material from another § 7606 program complies with all applicable laws and policies in the originating state. KDA has no authority to authorize or regulate industrial hemp materials physically located outside of the Commonwealth of Kentucky.

License holders whose research includes the investigation of potential landrace varieties of industrial hemp or any other varieties or genetic lines of unknown heritage must contact the KDA Industrial Hemp Research Pilot Program manager to arrange for replication and testing of the variety before it may be grown in Kentucky.

#### **Shipment Address**

All shipments of seed and/or propagules entering the program from another state must be shipped directly to the Kentucky Department of Agriculture, Industrial Hemp Program, 111 Corporate Drive, Frankfort, KY 40601 for inventory and distribution to approved license holders. **License holders are responsible for all risks and costs including shipping, damaged or missing inventory, etc.**

#### **Instructions**

Complete pages 1-2 and email it to [Hemp@ky.gov](mailto:Hemp@ky.gov).

**Otherwise, you may mail the completed form to:**

Industrial Hemp Program – Domestic Request

Kentucky Department of Agriculture, 111 Corporate Drive, Frankfort, KY 40601





**Kentucky Department of Agriculture  
Industrial Hemp Research Pilot Program**

**2018 Domestic Seed / Propagule Request**

OFFICIAL USE ONLY.

- This form and all required attachments are **due three (3) weeks in advance of proposed seed/propagule purchases** from within the United States, but outside of Kentucky.
- Only one seed source is allowed per form; submit a separate form for each source.

<b>License Holder:</b>		<b>License #:</b>
<b>Name of Signing Authority on License (if business):</b>		
<b>Email:</b>	<b>Phone:</b>	

- 1) **Attach independent third party test results for each variety/strain documenting the decarboxylated delta-9-THC concentration of 0.30% or less by GC or total THC by HPLC. Test results must also identify the seed source and varietal name.**
- 2) **Attach documentation verifying the source as a current legal hemp operation in the state of origin (registration, permit, license, etc.).**
- 3) **Complete the seed and/or plant variety information in the table below.**  
**NOTE: Participants are responsible for all seed costs including shipping, etc.**

Seed Source: Company Name and State	Seed and/or Propagules Variety/Strain Requested	Form of Material	Quantity (weight in lbs or number of plants)	Number of Packages
<i>Ex: 123 Hemp, CO</i>	<i>Hemp32</i>	<i>seed</i>	<i>1,500 lbs</i>	<i>30 x 50 lb bags</i>
<i>Ex: Hemp Green, OR</i>	<i>CBD54</i>	<i>Rooted cuttings</i>	<i>75 plants</i>	<i>1 cooler</i>

- 4) **If the requested seed shipment will be distributed to multiple license holders, you must complete the table on the following page.**
- 5) **Check the following box to affirm that the activities planned under your research project with the above described seeds/propagules will not infringe on the intellectual property rights of any person or business.**

**Signature of Signing Authority:** \_\_\_\_\_ **Date:** \_\_\_\_\_



<b>License Holder:</b>	<b>License #:</b>
<b>Signing Authority on License (if business):</b>	

**Intended hemp seed or propagule recipients (i.e., KDA approved license holders, or conditionally approved applicant awaiting orientation)<sup>†</sup> for the attached seed/propagule request.**

	<b>Name of License Holder or approved applicant</b>	<b>License #</b>	<b>Seed or Propagule Quantity (lbs or number of plants)</b>	<b>Hemp Variety</b>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				

**<sup>†</sup>Copy this page and attach additional sheets as necessary.  
 If additional sheets attached, indicate total number of sheets attached: \_\_\_\_\_**





Ryan F. Quarles  
Commissioner

Office of Agriculture Marketing  
Industrial Hemp Program  
111 Corporate Drive  
Frankfort, KY 40601  
Phone: (502) 573-0282

## Kentucky Department of Agriculture

### 2018 International Seed Request Requirements

#### **Compliance with Federal THC Threshold**

License holders must use only seed, propagules, or plants that are demonstrated to conform to the 0.3% delta-9-THC threshold. Documentation of measured THC levels shall be submitted to KDA with this request. Seed, propagules, or plants from outside of Kentucky which are not reviewed and approved by KDA are prohibited from use in Kentucky. Any license holder found using seed, propagules, or plants not reviewed and approved by KDA may be subject to the revocation of the *Licensing Agreement* in addition to any civil or criminal liabilities that may exist.

#### **Intellectual Property**

License holders are prohibited from growing for replication any intellectual property or genetic lines for which they do not have a license or written permission from the property owner. A copy of any license or permission from the property owner shall be provided in writing to KDA upon request. The Department shall not approve an *International Seed Request* form unless the License Holder affirms in writing that the Licensee's planned activities will not infringe on the intellectual property rights of any person.

#### **International Seed Acquisition**

All seed from international sources must be pre-approved and imported by KDA. Only seed intended for planting in Kentucky will be approved. License holders shall submit the *International Seed Request* form to KDA **no later than February 28, 2018**, to allow for sufficient time for processing of import permits and transit. Seed import permits may combine all purchases from a single company onto one permit. KDA will request permits for each international seed source, and then supply the Permit to Import to the license holder for use in scheduling the shipment.

#### **Details of Import Process**

- All shipments must:
  - Be accompanied by the Original Copy 1 of the DEA Import Permit.
  - Be accompanied by a valid Phytosanitary Certificate.
  - Be sent to The Kentucky Department of Agriculture, 105 Corporate Drive, Frankfort, KY 40601 for inventory.
  - Identify The Kentucky Department of Agriculture as the importer and buyer. **Confusion in the paperwork may cause significant delays in the import process.**
- Invoices are to be sent directly to the license holder by the seed suppliers, and the license holder is directly responsible for the seed payment and all costs associated with shipping and customs (e.g., brokerage fees, inspections, damaged or missing inventory, etc.).
- Any applicable Materials Transfer Agreements required by the seed supplier will be signed by the buyer (license holder), not KDA.
- KDA must be notified of the shipping details (company and importer broker name and contact information) as soon as it is known. That information should be emailed to [Doris.Hamilton@ky.gov](mailto:Doris.Hamilton@ky.gov).

#### **Instructions**

Complete pages 1-2 and email the completed pages to [Hemp@ky.gov](mailto:Hemp@ky.gov).

#### **Otherwise, you may mail the completed form to:**

Industrial Hemp Program – International Request  
Kentucky Department of Agriculture, 111 Corporate Drive, Frankfort, KY 40601





**Kentucky Department of Agriculture  
Industrial Hemp Research Pilot Program  
2018 International Seed Request**

**OFFICIAL USE ONLY.**

- This form is **due on or before February 28, 2018.**
- Only one exporter is allowed per form; submit a separate form for each exporter.

<b>License Holder:</b>		<b>License#:</b>
<b>Name of Signing Authority on License (if business):</b>		
<b>Email:</b>	<b>Phone:</b>	

1) **Attach documentation regarding the ability for this variety/cultivar to comply with the 0.3% delta-9-THC concentration limit. Indicate number of pages attached:** \_\_\_\_\_

2) **Complete the seed source information in the table below.**

**NOTE: Participants are responsible for all seed costs including shipping, brokerage, import, inspection, etc.**

<b>Seed Source</b>
i. Name of foreign export Company:
ii. Address of foreign exporter:
iii. Foreign port of exportation:
iv. Port of Entry (US Customs port where the shipment will clear):
v. Approximate date shipment will leave foreign port:
vi. Name of shipping company, if known:

3) **Indicate Mode of Transport:**     Air     Truck and Sea     Car     Mail     Truck  
     Sea     Train     Train & Sea     Other

4) **Complete the seed variety information in the table below.**

Seed Variety Requested	Quantity of Packages	Type of Package	Weight of each Package (kg)	Total Weight (kg)
<i>Ex: Hemp82</i>	<i>20</i>	<i>Bags</i>	<i>25 kg</i>	<i>500 kg</i>

5) **If the requested seed import shipment will be distributed to multiple license holders, you must complete the table on the following page.**

6) **I hereby affirm that my planned activities with the above described seeds will not infringe on the intellectual property rights of any person or business. Check this box:**

**Signature of Signing Authority:** \_\_\_\_\_ **Date:** \_\_\_\_\_



<b>License Holder:</b>	<b>License #:</b>
<b>Signing Authority on License (if business):</b>	

**Intended hemp seed recipients (i.e., KDA approved license holders, or conditionally approved applicant awaiting orientation)<sup>†</sup> for the attached seed import request.**

	<b>Name of License Holder or approved applicant</b>	<b>License #</b>	<b>Seed Quantity (kg)</b>	<b>Hemp Variety</b>
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				

**<sup>†</sup>Copy this page and attach additional sheets as necessary.  
If additional sheets attached, indicate total number of sheets attached: \_\_\_\_\_**

