MHD Cultivar Check Program

Project Overview

Thank you for your interest in participating in the ***Midwestern Hemp Database*** (MHD) Cultivar Check Program. Building off the work done in 2020, this private-public partnership seeks to collect, analyze, and share data on cultivar performance and laboratory analysis (Total THC and Total CBD) of chosen "Good Potential" cultivars (go.illinois.edu/HempReport). Up to 20 Midwestern (WI, MI, IL, and IN) hemp producers will be chosen to grow a subset of 5 "Good Potential" cultivars (4 CBD dominant, 1 CBG dominant) during the 2021 growing season for research purposes. Cultivars to be evaluated in this program are as follows:

Cannabinoid of Interest	Source	Variety
CBD Dominant	Oregon CBD	Suver Haze
CBD Dominant	Davis Farms of Oregon	Eighty Eight
CBD Dominant	Front Range Biosciences	Hybrid #5
CBD Dominant	Front Range Biosciences	Hybrid #9
CBD Dominant	Eastern Plains Hemp	Silver Lining
CBD Dominant	Infinite Tree/Arrowhead Seed Co.	BaOx Hybrid
CBD Dominant	Infinite Tree/ Arrowhead Seed Co.	Florence
CBD Dominant	Beacon Hemp	Early Neuve
CBG Dominant	KifCure	Buffalo Soldier
CBG Dominant	Oregon CBD	White CBG

For on-farm trials **our team will supply seed, shipping materials, and will cover costs of cannabinoid testing**. Tentative agronomic data collection, and cannabinoid sampling protocols can be found below. Growers will submit management and performance data via the SeedLinked platform, and flower samples for cannabinoid analysis by partnering laboratories; a field planting layout, SeedLinked account information, along with shipping materials and instructions will be provided following acceptance into the program. To be considered for participation in the "MHD

Cultivar Check Program**,"** **apply here** **by April 16th** to allow for timely dissemination of materials. Qualified growers will be selected on first come, first serve basis.

Growers will receive invaluable, firsthand experience of growing cultivars that have shown promise in the region. Data generated will improve the MHD for growers to use when making seed company and cultivar decisions while providing the needed transparency regarding laboratory protocols across the region. Additionally, by participating in the MHD Cultivar Check Program, growers can have their samples analyzed by both MHD participating laboratories (Rock River Laboratory Inc. and ACT Laboratories) to evaluate differences in laboratory analytical methods across the region. Upon collection of samples at Rock River Laboratory Inc., sub-samples will be collected and sent to ACT laboratories for secondary analysis. Growers will receive reports from both laboratories and this information will be used to evaluate various laboratory protocols in the region. Importantly, growers only need to send samples in to Rock River Laboratory initially, and the rest will be taken care of.

Growers may be expected to sign Material Transfer Agreements (MTAs) for selected cultivars based on agreements with seed providers. Licensed growers will be responsible for updating their respective state/tribal/federal regulators regarding the cultivars to be grown for this program; similarly all rules and regulations regarding regulatory agency notification and compliance testing must be followed if this material is to be harvested and enter the supply chain. **The testing done by ACT Laboratories and Rock River Laboratory Inc. for MHD Cultivar Check Program do not replace state/federal/tribal compliance testing.** Growers are responsible for proper destruction or remediation of any and all non-compliant hemp as determined by appropriate regulatory bodies.

Planting/Transplanting Protocols

- Growers will receive 20-25 seeds per cultivar per location depending on availability
- Seedlings will be established using indoor/greenhouse methods in late April or early May (practices may vary).
- Seedlings will be allowed to develop in a greenhouse/hoop house for 4-5 weeks prior to a "hardening off" period. For the hardening off period, seedlings will be placed outdoors for 5-7 days to get accustomed to outdoor conditions.

- Following a 1 week hardening off period ~15 healthy, representative seedlings per cultivar will be transplanted into the field. Target field transplant dates will be early to mid-June but may vary slightly.
    - Row spacing/plant spacing may vary according to production practices, but we ask that both between row and within row spacing be kept at least 4 feet per plant (> 16 square feet per plant)

Growers will be responsible to accurately record all seed start/transplant date information.

Hemp Sampling Protocols

After transplanting into the field, five plants for each cultivar will be **randomly selected** and marked using plant tags; these tags will be provided to you and will mark the plants used for data collection and floral sampling. *All other plants for each cultivar **will not** be used for the purposes of agronomic data collection or cannabinoid sampling.*

Floral samples will be collected from the same five tagged plants at multiple time points throughout flowering for each cultivar. Flower samples are to be collected at 3, 5, and 7 weeks after the flowering date (~21 days, 35 days, and 49 days, respectively). The flowering date is defined as the date at which half of the plants in the field have visibly initiated terminal flowering for each cultivar. A plant reaches terminal flowering when plants show extruding stigma at the top inflorescence of the plant. Sampling of the floral material is described below.

Important Note: Cultivars may experience variation in flowering dates, and we ask that growers attempt to minimize the amount of shipments required for this project. The goal is to submit 3 bulk shipments containing all samples to the lab for each sampling period (3rd week, 5th week, 7th week post flowering). All shipping materials and instructions will be issued upon acceptance into the program.

- All samples must be collected from the flowering tops of the plant (Figure 1). Utilizing shears or scissors, cut the top five to eight inches from any inflorescence located at the top third of the plant

Figure 1. This figure illustrates proper sampling locations to be taken from any inflorescence located on the top 1/3 of the plant.

- Place the flowers in the paper bag and write the sample name clearly on the outside. Do not keep the sample in a plastic bag.
- Repeat this step on four other plants until so a total of 5 flowers are collected. 5 flowers will be placed into one bag and are equal to one complete composite sample.
    - Here is a video demonstrating these sampling procedures
    - Samples may be harvested and air dried prior to bulk submission noting cultivar, sampling period, and sample collection date.
    - Target moisture is 10-12% for long term storage
- Samples will be sent for analysis using provided packaging and materials to:

Rock River Laboratory

710 Commerce Dr.

Watertown, WI 53094

Agronomic Data Collection Protocols

The same five plants of each cultivar should be used for cannabinoid profiling and data collection throughout the season. Traits to be tentatively evaluated and their descriptions are found in Table 1. Data collected will be submitted via the SeedLinked app; instructions for SeedLinked will be provided once accepted into the program.

Traits/stages	Info box content
Planting date	Date of initial seeding (greenhouse or field).
Germination	A qualitative visual rating of germinative capacity, speed and germination rate.
Transplanting date	Date of transplanting into the field.
Vigor	Overall plant growth vigor.
Floral Disease Resistance	Overall qualitative disease resistance rating, based on visual appearance slightly before last harvest date. 1=poor, 5=excellent.
Foliar Disease Resistance	Overall qualitative disease resistance rating, based on visual appearance slightly before last harvest date. 1=poor, 5=excellent.
Insect Resistance	A visual evaluation of insect pest tolerance, with 5 equal to no presence of insect damage.
Earliness	A visual evaluation of earliness of harvest, compared to the other varieties in the trial, with 5 being very early.
Height	A visual assessment of the plant height, with 5 being most desirable.
Width	A visual assessment of the plant width, with 5 being most desirable.
Lodging Resistance	A visual rating of lodging resistance. 1=poor, 5=excellent resistance.
First flower date	The date at which the first plant in the field has visibly initiated terminal flowering.
50% Flowering Date	The date at which half of the plants in the field have visibly initiated terminal flowering. A plant reaches terminal flowering when half of the plants show extruding stigma at the top inflorescence of the plant
Final Flowering Date	The date at which the last plant in the field has visibly initiated terminal flowering.
Aroma	How aromatic is this variety compared to others in the trial? 1=poor, 5=excellent aroma
Marketability	How easy would it be to sell this variety; is it desirable for your markets? 1=not marketable, 5=very marketable
Uniformity	Overall uniformity of the plants within a cultivar. 1=not at all, 5=very uniform
Upright Stature	A visual evaluation of plant stature, with 5 being upright/good, and 1 being undesirable.
Ease Of Harvest	How easily harvestable is a variety from 1 (difficult) to 5 (very easy).
Whole Plant Biomass Yield	Whole Plant Biomass Yield (lbs./plant) 1 (0-2.5 lbs) 2 (2.5-5.0 lbs) 3 (5.0-7.5 lbs) 4 (7.5-10.0 lbs) 5 (10.0 lbs+)
Flower Yield	Stripped Floral Yields (lbs./plant) 1 (0-1.5 lbs) 2 (.5-1.0 lbs) 3 (1.0-1.5 lbs) 4 (1.5-2.0 lbs) 5 (2.0 lbs+)
Harvest date	Date of your first full harvest. You must enter this date for each variety to be able to complete the trial.

Table 1. Production System and Agronomic Data to be Collected for Each Cultivar

Plant yield (Whole Plant Biomass and Floral Yields) *

- All 5 plants used for data collection and sampling will be cut and harvested below the lowest branch. Plants will then be moved to a drying facility and hung up for complete drying (~10-12% Moisture).
- Dried whole plants will be weighed to determine "whole plant biomass"
- Plants will be stripped (removing stems, stalk, some leaves, minor amounts of floral structures) by hand or via bucking equipment to separate floral structures from remaining biomass for all plants per cultivar.
- Both A) Whole Plant Biomass and B) Floral Yields will be weighed and recorded separately. Yield (lbs./plant) will be reported as average of all 5 plants per cultivar.

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If you choose to submit information to us, any private information (name, address, license number, etc.) **will not be available in the publicly accessible database** and will be used only

for the purposes for which it was provided, and will not be shared with another entity, except as prescribed by law.

All other information (seed source, cultivar, planting date, sampling date, cannabinoid production, yield, etc.) collected can/may be entered into a publicly accessible database and SeedLinked Platform.

All information collected at this site becomes public record that may be subject to inspection and copying by the public, unless an exemption in law exists.

If you have any questions or are interested in participating in this program, please contact Phillip Alberti at palberti@illinois.edu or 217-300-7392.