2022 GRAIN & FIBER HEMP VARIETY TRIALS

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PURPOSE: Compare performance of available fiber and grain hemp varieties, under central IL growing conditions.

TRIAL LOCATIONS: University of Illinois Research and Education Center in Urbana, IL

EXPERIMENTAL DESIGN: Randomized complete block design with four replications.

TRIAL MANAGEMENT:

- Planted May 24 for both fiber (31 PLS/ft^2) and grain (15 PLS/ft^2)
- Plots size: 4 ft. X 20 ft.
- Row spacing: 7.5 in.
- Planting depth: ¾ - 1 in.
- Borders and alleys planted to decrease edge effect
- Fertilizer: 50 lbs N/ac for fiber and 100 lbs N/ac for grain with 32% UAN
- 3 pt/ac of Prowl® H2O Herbicide before planting
- Fiber harvested Aug 16th
- Grain harvested October 6th and 7th

TAKE AWAYS:

- Accurate germination test is necessary to ensure stand density
- Harvest grain at physiological maturity to avoid grain loss
- Grain and fiber varieties were all THC compliant.

Background and Methods

With support from the Illinois Farm Bureau and the Illinois Hemp Growers Association, researchers from the University of Illinois established commercially available varieties of fiber and grain hemp (*Cannabis sativa* L.) for a third growing season. Trial plots (4 ft. wide by 20ft. long) were initiated at the University of Illinois Fruit Research Farm in Urbana, IL, using an RCBD design with four replications. Table 1 shows the weight of 1000 seeds for each variety; seed packets were filled with the proper quantity of pure live seeds (PLS) using those weights. The fiber trial seeding rate ranged from 25 to 31 PLS per ft^2. The grain trial seeding rate was 15 PLS per ft^2 with a targeted final plant population of 12 plants/ft^2. The PLS for each variety was calculated using seed germination tests in a greenhouse setting. Row spacing was 7.5 inches, and seeds were placed to a depth ranging from 0.75 to 1 inch deep to allow for proper soil moisture. Plots were subsequently trimmed to approximately 16.5 feet in length during the middle of the season. Stand counts were taken 35 days after planting to ensure adequate plant populations for trial evaluations (Table 2 and Table 3). Weeds were controlled by spraying Prowl® H2O Herbicide after planting and hand hoeing until hemp plants reached 4 to 6 feet in height. Flowering started in the middle of June, and most varieties were finished by mid-August. Trials were fertilized with liquid UAN prior to planting at 100 lbs. of nitrogen per acre for grain trials and 50 lbs. of nitrogen per acre for fiber trials. After flowering, samples were taken to evaluate THC content and provided to the Midwest Hemp Database (https://extension.illinois.edu/global/midwestern- hemp-database). All varieties fell below the legal limit of 0.3%. The fiber trial was harvested on August 16th with a sickle bar mower, and the grain trial was harvested by hand on October 6th and October 7th. Moisture content was measured by collecting fiber biomass subsamples and kept in a drying oven for seven days at 140°F until no moisture was present; yields were calculated using 0% moisture correction. Bundled subsamples were also collected and retted in the field for fiber analysis. The whole plot was harvested for the grain trail, and yields were adjusted to 9% moisture.

Results and Discussion

The original seeding date was intended for the first half of May, but frequent rain events postponed the planting date to May 24th. Following planting, rainfall occurred for a few days, then stopped until July 9th. Due to drought conditions, only three varieties of fiber and one for grain achieved the target population 35 days after planting. However, biomass yields were not affected by the stand densities ranging from 16 to 41 plants/ft^2 observed on this variety trial, but individual stem thickness were significantly affected by stand densities. Stem thickness is an important chracteristics for fiber yield and quality and we need to consider measuring the stem thickness and fiber yield in the future. No significant diseases or pests were observed throughout the growing season. The highest-yielding variety of fiber hemp was Carmenecta, and the lowest-yielding was Bialobrzeskie at 7.07 and 3.91 ton of

unretted dry matter per acre. The other fiber varieties were similar, ranging from 5.26 to 6.03 ton/ac (Table 1).

In this year, we had an inssue with the maturity difference in each variety and dealying of machine harfvest of erly maurting varities resulted low yields associated with signgifcant sharttering of seeds. Xianwei, latest maturing variety, had the largest grain yield (1456 lb/ac), weight per 1000 seed (23.3 g), and the smallest number of seeds per pound (17,246) (Table 2). However, high yield was not necessary associated with the maturity date rather accurate yield estimation with a right timing of harvest.

Figure 1. 2022 hemp variety trial, fiber type (left) and grain type (right) at Urbana, IL. Picture taken July 6th, 2022.

Table 1. Fiber hemp performance at Urbana, IL.

Variety	Habit*	g/1000 seeds	Seeds/lb	Stand** (1ft^2)	Flower date	Height (ft)	Unretted DM yield (ton/ac)
AV1	-	15.03	30,140	41.82	17-Jul	7.57	6.02
Bialobrzeskie	Mono	13.93	32,520	21.78	15-Jul	6.04	3.91
Carmenecta	Dio	20.44	22,162	16.4	10-Aug	8.88	7.07
Enectarol	Dio	19.52	23,207	28.53	10-Aug	8.32	5.26
Fibror 79	Mono	18.8	24,096	21.56	24-Aug	7.89	5.49
Futura 75	Mono	17.9	25,307	19.96	7-Jul	7.49	5.34
Futura 83	Mono	17.2	26,337	17.69	2-Aug	8.42	5.97
Orion 33	Mono	17.9	25,307	27.33	5-Jul	7.95	6.03

*Mono, monoecious; Dio, dioecious.

**Stand density measured at 25 days after planting.

Table 2. Grain hemp performance at Urbana, IL.

Variety	Habit*	g/1000 seeds	Seeds/lb	Stand** (1ft^2)	Flower date	Height (ft)	Grain yield (lbs/ac)
AmazeAuto	Dio	11.02	41,107	5.8	13-Jun	4.19	7.7
Bialobrzeskie	Mono	13.93	32,250	6.63	2-Jul	6.77	9.2
Earlina 8FC	Mono	14.21	31,879	8.2	20-Jun	6.03	5.6
NWG 2463	Dio	14.33	31,612	7.07	15-Jul	7.15	460.6
NWG 2730	Dio	12.53	36,153	6.33	11-Jul	8.39	401.3
NWG 4000	Dio	17.21	26,322	16.13	13-Jul	7.03	294.5
NWG 4113	Dio	15.33	29,550	9.73	13-Jul	6.88	393.0
Orion33	Mono	17.9	25,307	4.43	6-Jul	7.95	262.8
Vega	Mono	19.8	22,879	9.67	20-Jun	5.97	37.4
Xianwei	Dio	26.3	17,246	5.67	17-Aug	7.85	1456.0

*Mono, monoecious; Dio, dioecious.
**Stand density measured at 25 days after planting.

Participating Companies

We are thankful for the below companies for their support of this trial in 2022

Trial Sponsors

Illinois Farm Bureau
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Bloomington, IL 61701
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Illinois Hemp Growers Association
18568 1750 N Ave
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www.illinoishga.com

Seed Suppliers

Acquiflow
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