

# INDUSTRIAL HEMP PERFORMANCE IN ILLINOIS TRIALS - 2021

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The second industrial hemp trials were conducted in 2021 at the University of Illinois Research and Education Center located in Urbana, IL. The trials were conducted to evaluate commercial varieties for fiber and grain yields.

### Materials and Methods

Each variety had a 1000 seed weights measured (Table 1) to fill packets with the proper quantity of pure live seeds (PLS). The fiber trial had a target seeding rates of 25 and 35 PLS per ft<sup>2</sup>. The grain trials had a target seeding rates of 15 and 25 PLS per ft<sup>2</sup>. Trials were fertilized with liquid UAN prior to planting at 100 lbs. of nitrogen per acre for fiber and grain trials. Our industrial hemp variety trials consisted of four replications of six, 7.5-inch rows planted to a depth range of .75-1 inch to get seed into soil moisture. Plots were trimmed to about 19 feet in length before harvest for fiber and 16 feet for grain prior to harvest. Stand counts were taken three weeks after planting to ensure adequate plant populations for trial evaluations (Table 2 and Table 3). Flowering started at the end of June and most varieties were finished by mid-August. Several varieties had not started to flower prior to harvesting (Table 1). 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 .3%. Uniformity ratings were unable to be taken due to a storm even on August 12 that caused lodging. Plants were able to recover to ensure a reliable harvest was achieved. The fiber trial was harvested on August 26<sup>th</sup> and 27<sup>th</sup> with a Wintersteiger Cibus S and grain trial was harvested with an Almaco SPC 20 on September 13<sup>th</sup>. A subsample was collected for the fiber trials and allowed to remain in a drying oven for seven days at 140°F till no moisture was present. Whole plots were collected for grain trials. Each plot sample was placed in dryer for 48 hours at 140°F to remove moisture. The whole sample was passed through an air blower to remove foreign material and reweighed to determine grain yields. Yields were corrected to 9% moisture for grain and 0% for fiber. AGROBASE Generation II by Agronomix Software, Inc statistical software was used to create each randomized complete block trial for grain and fiber and perform statistical analysis. No seed treatments or herbicides were used during this trial.

### Results and Discussion

The 2021 industrial hemp growing season in Illinois had ideal growing conditions all season long. Emergence started to occur four days after planting. Hemp was able to outcompete the majority of weeds observed and relatively low abundance in the plots used for compiling yield data. Weed pressure increased as plants senesced, and canopies opened or in plots with poor emergence. A few plots experienced clipping of the stems from pests and no major diseases were observed throughout the growing season.

No entry achieved the target population two weeks after planting for grain and fiber. Dormant plants were observed while harvesting though had no major impact toward yield from late germinated seeds. Final stand counts were taken on a few entries yet no significant change in early stand counts to post harvest counts were noted. Further work on dividing plants by plant height or stem diameter to determine accurate stand thinning is needed. Fiber and grain yields, stand counts, and grain moisture (Tables 2 and 3) are provided with CV, LSD, and test means. There was no significant difference between seeding rates within a variety.

Recommended planting time is mid spring (late April/early May). Future research needs conducted to evaluate optimum planting dates for grain, fiber, and double cropping potential.

Participating companies are listed on Page 2, trial information and variety data Table 1 (Page 3), fiber data in Tables 2 (Page 4), and grain data in Table 3 (Page 5).

## Participating Companies

We are thankful for the below companies for their support of this trial in 2021.

## Trial Sponsors

**Global Hemp, Inc.**  
PO Box 5125  
Peoria, IL 61603  
www.globalhemp.com

**Prairie Producers**  
2430 W. Lincoln Avenue  
Olivia, MN 56277  
www.prairieproco.com

**Illinois Farm Bureau**  
1701 Towanda Ave.  
Bloomington, IL 61701  
www.ilfb.org

**Illinois Hemp Growers Association**  
18568 1750 N Ave.  
Princeton, IL 61356  
www.illinoishga.com

## Seed Suppliers

**Bish Enterprises/Hemp Harvest Works**  
508 S. D Road,  
Giltner, NE 68841  
www.bishenterprise.com  
www.hempharvestworks.com

**Hemp Industrial Partners**  
www.hempindustrialpartners.com

**MASA Ag LLC**

**Hemp Genetics International**  
706 6<sup>th</sup> Ave N.  
Saskatoon, SK S7K 2S9  
www.hempgenetics.com

**International Hemp**  
1766 W 46<sup>th</sup> Avenue  
PO Box #11806  
Denver, CO 80211  
www.international-hemp.com/

**New West Genetics**  
320 East Vine Drive Suite 225  
Fort Collins, CO 80524  
www.newwestgenetics.com

**Hempoint**  
Hruškové Dvory 116  
Areál Gold Crystal  
Jihlava, 586 01  
Czech Republic.  
hempoint.cz/en

**King's AgriSeed, Inc.**  
6321 Freedom R. #101  
Lancaster, PA 17601  
hemp.kingsagriseeds.com

**Rohrer Seeds**  
2472 Old Philadelphia Pike  
Lancaster, PA 17602  
www.rohrerseeds.com



Location	Cooperator	Soil type	Planting date	N Fertilizer	Harvest date
Urbana	Tim	Flanagan	June 3	100 Fiber	Fiber Aug 26 & 27
	Mies	silt loam 0-2 percent slope		100 Grain	Grain Sept 13

Table 1. Plant Characteristics

Variety	KWT (g)/1000	Seeds per lb	Plant Height (ft)	Flowering Date Range (10%-90%)	Standard Germination Test Results
A2	10.5	43257	6.92	July 18-July 23	85%
Amaze Auto	11.3	39999	1.79	June 26-July 2	25%
Białobrzeskie	13.3	34092	4.63	July 10-July 19	87%
Carmagnola	18.3	24795	6.87	July 19-July 27	80%*
CFX-2	16.1	28104	3.02	June 28-July 5	94%
Fedora 17	16.9	26908	5.11	July 12-July 23	92%
Felina 32	15.0	30306	5.31	July 17-July 23	92%
Ferimon 12	15.3	29602	4.73	July 18-July 22	90%
Fibror 79	18.9	23944	6.43	July 20-Aug 8	87%
Futura 75	18.0	25201	5.71	July 14-July 23	89%
Futura 83	17.3	26189	6.62	July 22-Aug 8	90%*
Grandi	15.7	28818	2.50	June 27-July 3	87%
Henola	14.6	30962	4.55	July 13-July 20	67.5%
Hlesiia	15.5	29818	4.59	July 8-July 18	95%
Hliana	16.6	27294	4.94	July 9-July 18	90%
Jinma	29.6	15332	7.82	NA‡	91%*
Katani	14.1	32170	2.36	June 27-July 3	72%
Kompolti	17.9	25354	7.28	July 21-July 28	88%
MS77	25.3	17962	8.51	NA‡	61%*
NWG 2463	14.3	31707	5.38	July 14-July 21	76%
NWG 2730	12.5	36143	5.64	July 16-July 21	99%
NWG 4000	15.2	29747	5.25	July 14-July 20	86%
NWG 4113	14.4	31489	5.90	July 14-July 20	76%
Puma	30.6	14833	not planted in trial		23%
Piccolo	15.4	29359	2.90	June 28-July 5	76%
Tiborszallasi	18.6	24452	6.64	July 10-July 18	82%
USO 31	15.7	28900	4.24	July 13-July 18	85%
X-59	14.1	32268	2.64	June 28-July 5	90%*
Yuma	29.7	15284	8.34	Oct 1†	89%*

\* No germination data was provided with seed. Due to late delivery a 75% germination rate was assumed for trial purposes. Seed samples were taken to Illinois Crop Improvement for true germinations.

† 50% flowering date from discarded grain plot

‡ Plot was harvested before flowering notes could be taken

Table 2. Fiber Trial Results

Variety	Plants ft <sup>2</sup>	Biomass Yield (tons/A) at 0% Moisture
A2 – 1x	15.36	3.19
A2 – 2x	20.52	3.19
Białobrzeskie – 1x	20.16	2.45
Białobrzeskie – 2x	24.04	2.30
Carmagnola – 1x	16.68	3.88
Carmagnola – 2x	21.72	3.99
Fedora 17 – 1x	15.72	1.98
Fedora 17 – 2x	26.36	2.12
Felina 32 – 1x	17.76	2.79
Felina 32 – 2x	22.24	2.83
Ferimon 12 – 1x	17.80	1.84
Ferimon 12 – 2x	23.24	1.93
Fibror 79 – 1x	17.60	3.59
Fibror 79 – 2x	22.64	3.51
Futura 75 – 1x	18.08	3.30
Futura 75 – 2x	24.92	3.49
Futura 83 – 1x	18.68	4.40
Futura 83 – 2x	24.88	4.35
Henola – 1x	20.08	2.20
Henola – 2x	21.40	2.04
Hlesiia – 1x	10.52	1.30
Hlesiia – 2x	12.48	1.24
Hliana – 1x	3.60	0.79
Hliana – 2x	9.08	1.14
Jinma – 1x	20.36	5.11
Jinma – 2x	26.28	5.52
Kompolti – 1x	15.20	4.06
Kompolti – 2x	19.60	4.37
MS77 – 1x	2.64	2.65
MS77 – 2x	3.24	3.33
Tiborszallasi – 1x	22.72	3.56
Tiborszallasi – 2x	27.08	3.30
Yuma – 1x	17.00	5.51
Yuma – 2x	22.68	6.24
Trial Mean	18.30	3.16
LSD, 10%	4.28	.59
CV, %	19.92	15.82

1x = 25 PSL/ft<sup>2</sup>2x = 35 PSL/ft<sup>2</sup>

Table 3. Grain Trial Results

Variety	Plants ft <sup>-2</sup>	% Moisture*	Grain Yield (lbs/A) at 9% moisture
Amaze Auto – 2x	16.8	----- <sup>†</sup>	----- <sup>†</sup>
CFX-2 – 2x	12.0	----- <sup>†</sup>	----- <sup>†</sup>
Grandi – 2x	14.7	----- <sup>†</sup>	----- <sup>†</sup>
Henola – 1x	9.9	14.50%	1196.4
Henola – 2x	12.7	13.20%	1199.3
Katani – 2x	14.6	----- <sup>†</sup>	----- <sup>†</sup>
NWG 2463 – 1x	4.4	21.30%	1479.2
NWG 2463 – 2x	10.4	18.70%	1474.0
NWG 2730 – 1x	13.4	21.80%	1434.4
NWG 2730 – 2x	12.0	25.30%	1246.4
NWG 4000 – 1x	8.4	18.50%	1274.8
NWG 4000 – 2x	11.3	17.30%	1278.9
NWG 4113 – 1x	7.1	21.60%	1317.5
NWG 4113 – 2x	9.8	19.10%	1243.1
Piccolo – 2x	6.0	----- <sup>†</sup>	----- <sup>†</sup>
USO 31 – 1x	8.5	16.90%	339.3 <sup>‡</sup>
USO 31 – 2x	14.6	16.40%	446.4 <sup>‡</sup>
X-59 – 1x	11.4	10.80%	1065.7 <sup>‡</sup>
X-59 – 2x	18.6	12.80%	837.9 <sup>‡</sup>
Trial Mean	10.9	18.20%	908.1
LSD, 10%	2.05	2.60%	250.9
CV, %	20.5	15.5	30.1

1x = 15 PSL/ft<sup>2</sup>2x = 25 PSL/ft<sup>2</sup>

\* Moisture content of grain and plant material.

<sup>†</sup> Plots harvested significantly past optimum date<sup>‡</sup> Plots harvested moderately past optimum. Shattering was observed prior to harvest.