

Seed sources, dioecy, feminized seed,
and pollen drift: Things to consider

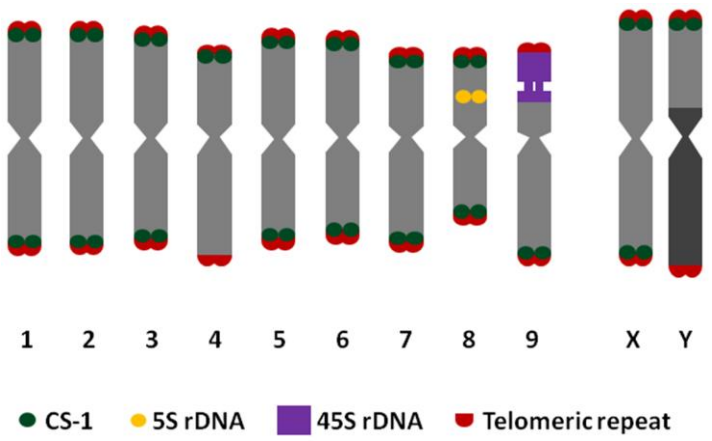
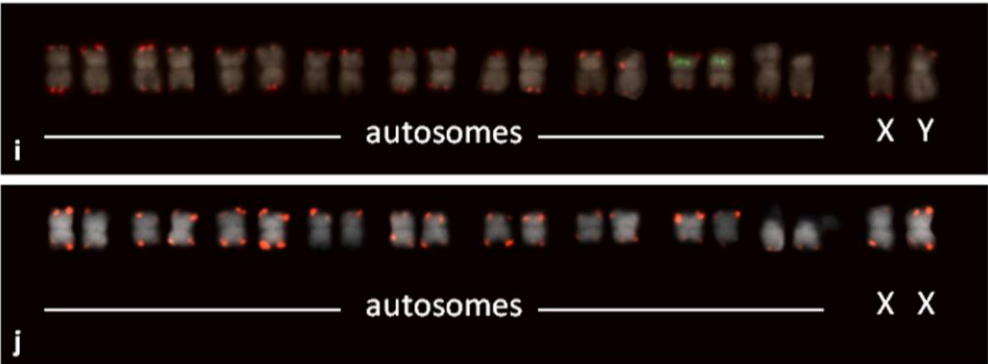
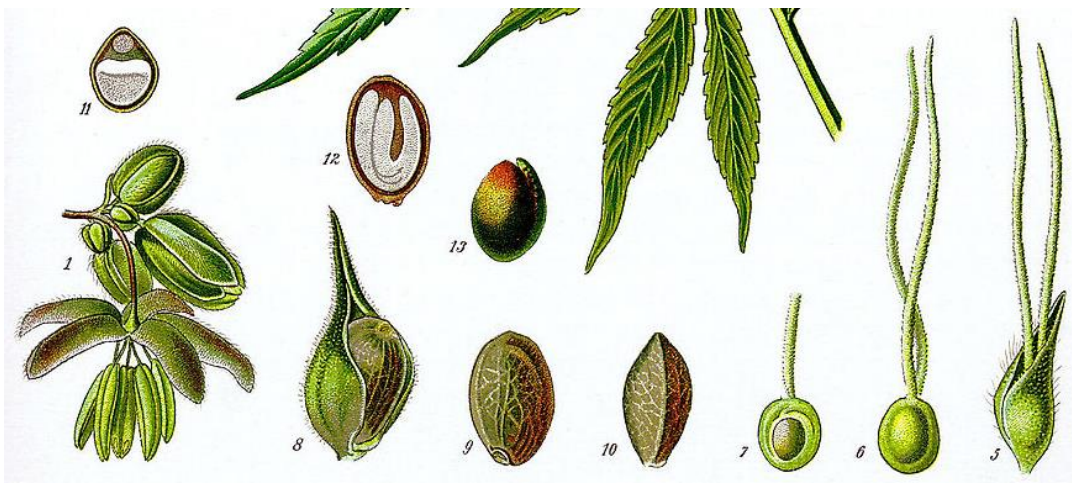
Jessica Lubell

Only 6% of flowering plant species are dioecious, including hemp (*Cannabis sativa*)



Dioecious hemp

- distinct male (XY) and female (XX) individual plants
- Seed is ~50:50 male:female
- Females desired for CBD
- Cull males before anthesis; seed set reduces CBD



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Police say everyone should carry this new safety device that pr
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Hemp Fraud Hits Farmer With Clone Scam

NOVEMBER 27, 2018 06:56 AM

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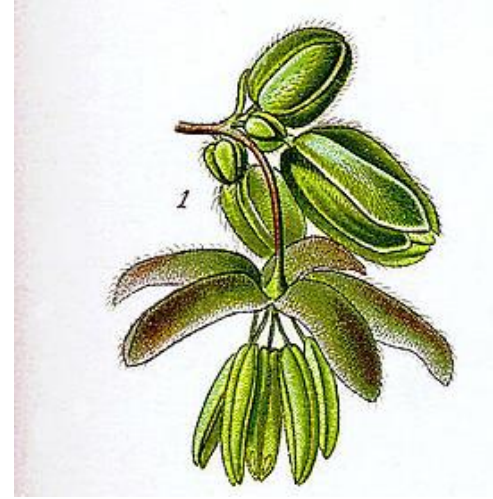


Hemp scam: One of 10 trailer loads pulled from Chris Adams' fields. "Our plants were worthless," he says.

- Monoecious cultivars for 'dual purpose' production (fiber and grain)
- Monoecious means a single plant produces separate male and female flowers
- Monoecious hemp seed results in plants with lots of female flowers and suitable number of male flowers/plant
- Avoid monoecious plants for CBD production

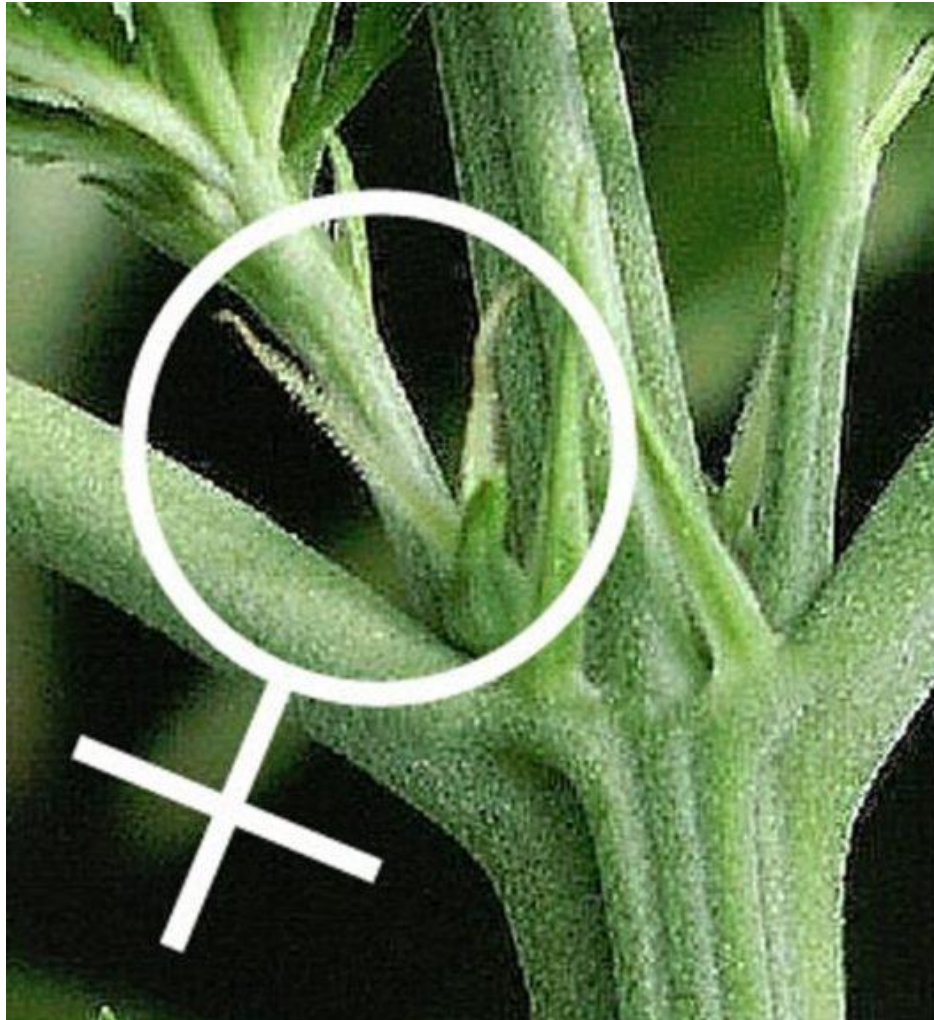


- A single male flower can contain 350,000 pollen grains
- Pollen can travel long distances by wind
- In a 2000 Midwest US study, hemp pollen represented 36% of total airborne pollen
- ~5 km isolation distance for pure-bred seed; exceeds virtually every other crop
- UVM: 3 miles for certified seed; 15 miles for marijuana
- Pollen viability 2-3 days; Male flowering period can last 2-3 weeks
- Dr. Ernest Small; 2015, 2018



Identifying hemp gender

Axillary flowers are evident soon after flower/short day initiation



It's possible to determine gender earlier during *vegetative* growth from pre-flowers on 3-6 week old seedlings



Solitary axillary
primordia

3 to 4 month old female plant from rooted cutting under long days in GHSE with axillary flowers, never exposed to short days



- Transition opposite to alternate prior to flower induction conditions
- Progressive phase change from juvenile (non-flowering, opposite leaves) to mature (terminal flower clusters, alternate leaves) over long days to short days



Plasticity in reproductive expression in CBD hemp from landrace???

Abacus Hemp Seed (non-feminized)

"OG" X "Purple Urkle" X (Landrace) Hemp Strain

\$10K per pound (minimum order - 1 lb)

Our proprietary hemp strain, Abacus, has Northern Cali origins, and is extremely stable, as it has been bred for 9+ years. It produces a high flower yield, with a bountiful terpene spectrum, and the flower and oil has a smooth and delicious taste and aroma. The flower has been sold to smoke, and the oil is highly palatable and great for making any type of products.



"OG" X "Purple Urkle" X (Landrace) Hemp Strain

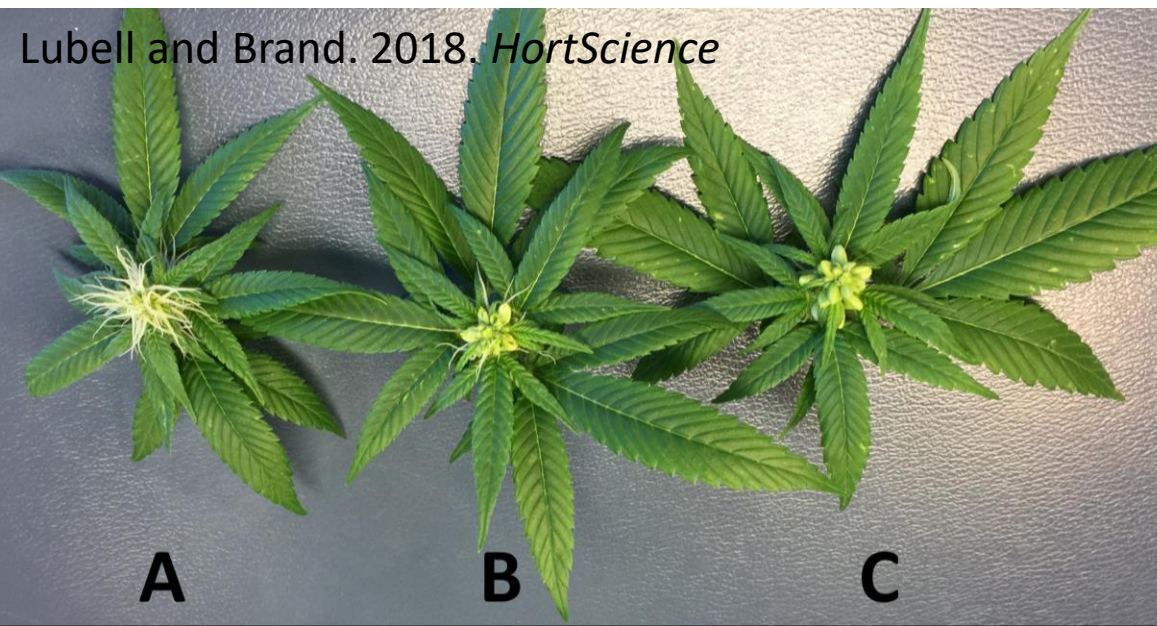
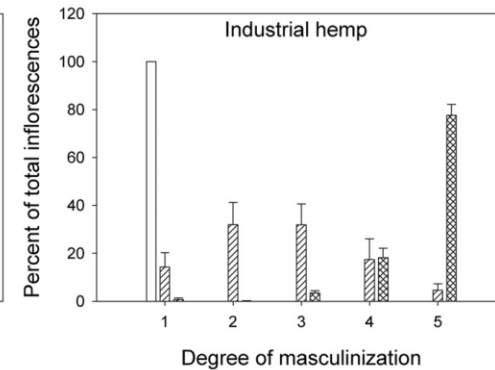
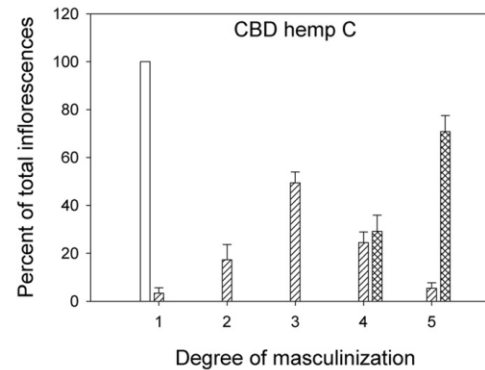
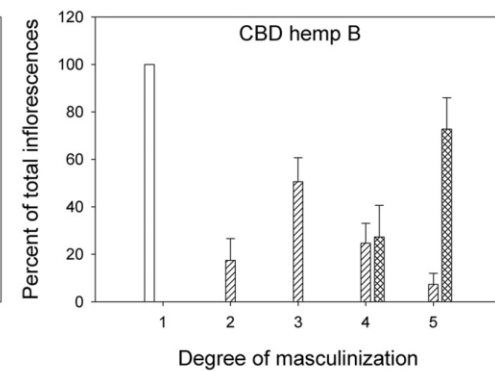
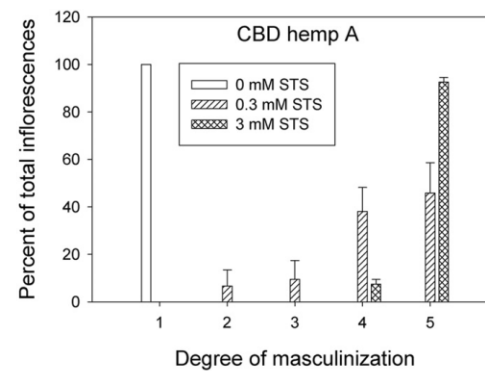
Northern latitude
C. sativa var. *ruderalis*

- Land race strains can be “autoflowering”
- Automatically switch from vegetative to flowering with age, as opposed to photoperiod
- Early harvest - less than 10 weeks from seed
- Plants are smaller, branch less = less yield



Feminized seed

- Induce a female (XX) to make male flowers by altering hormone levels
- All pollen will be female (X); all new seed will be female (XX)
- Prevent pollen contamination
- Even indoors/GHSE if males nearby during venting season
- \$1+/seed



“nearly 100% female”

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FEMINIZED HEMP SEEDS

Whether you're an expert at growing hemp or a novice hemp producer, our feminized seeds and Clean Stock® hemp plants will provide hemp growers with consistent, disease-free, high-yielding harvests. By combining the best practices in agriculture with modern science, we reduce risk for growers across the country with greenhouses located in Colorado and Wisconsin.

Our hemp seed and Clean Stock plants contain less than .3% THC and have cannabinoid traits that consumers most desire.

QUALITY-SORTED, FIELD-TESTED, FEMINIZED HEMP SEED

FRB's field-tested feminized hemp seed, originates from our world-class breeding program. All feminized seed has been tested for consistent genetic profiles and has been pre-sorted for the highest quality. Our hemp seed is indoor and greenhouse harvested and comes with documented germination rates, **male/female ratios < 1:1000**, and population variance on CBD/THC yields. All feminized hemp seeds are exhaustively tested to meet the most stringent standards.

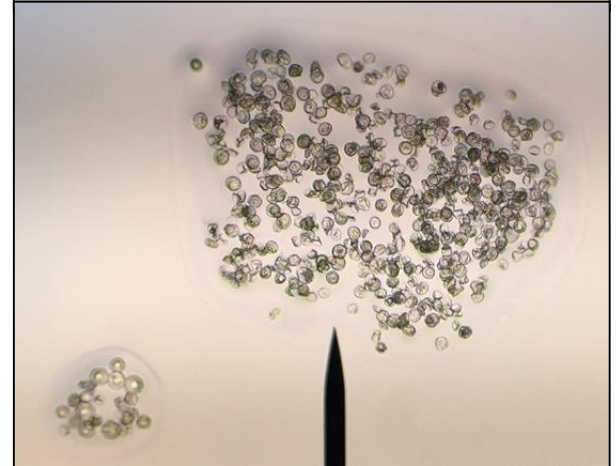
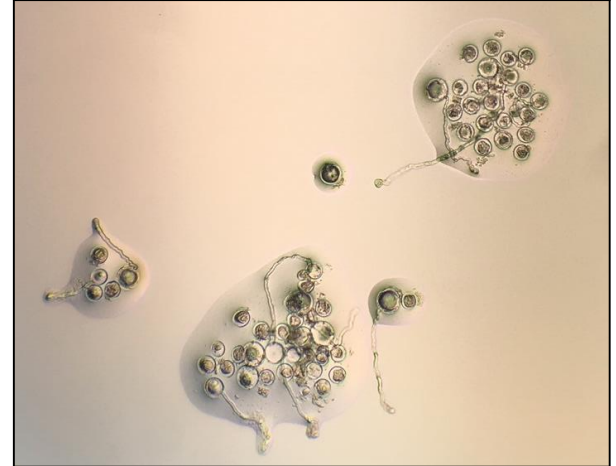
Hemp seed is ideal for outdoor growing or germinating new plants for outdoor or indoor planting. Contact us to learn more about our unique testing and how we differ from other seed suppliers or for a full catalog of available feminized hemp seed.

Feminized seed research – UConn R&D

- Cultivars differ in ability to masculinize
- Evaluate strains and self vs. out crosses
- CBD and genetic uniformity (hybrid vigor v. inbreeding depression?)
- Identify reliable parent strains and crosses...elite feminized seed
- New niche crop for GHSE growers



~1300 seed, self cross



- Even if using feminized seed, monitor for stray males...
- What about pollen drift from neighboring fields or feral plants?



Potential solutions to pollen contamination from drift – UConn R&D

- Primary objective: Sterile (“seedless”) female cultivars
- Spray females to prevent pollination?
- Autoflowering strains





STATE OF CONNECTICUT

DEPARTMENT OF AGRICULTURE



Office of the Commissioner

Bryan Hurlburt
Commissioner

860-713-2502
agr.hemp@ct.gov

CERTIFIED SEED SOURCE INFORMATION

(rev. 5/20/19)

Examples of where to find Hemp seed that may be cultivated in Connecticut

[Assoc. of Official Seed Certifying Agencies](#)

[Kansas Crop Improvement Assoc.](#)

[Colorado Dept. of Agriculture](#)

[Kentucky Dept. of Agriculture](#)

[Wisconsin Department of Agriculture, Trade and Consumer Protection](#)

[Oklahoma Agriculture, Food and Forestry](#)

[Montana Department of Agriculture](#)

Note: this list is not exhaustive and does not constitute an endorsement of any organization or variety of Hemp. It is the Hemp grower's responsibility to ensure Hemp varieties selected are acceptable for use in Connecticut. We cannot be responsible for broken links.

Some seed, clone or propagule suppliers may ask for a permit number as their state may only allow sales to licensed or permitted individuals or businesses. Your license number should satisfy these requirements.

If you have any question regarding the use of a specific variety of Hemp seed or clone, please contact the department at (860) 713-2502 or agr.hemp@ct.gov. Please include as much information about the variety as you can.

Certified Seed, or clones or propagules obtained from Certified Seed must be used. Certified seed means hemp seed for which a certificate or any other instrument has been issued by an agency authorized under the laws of a state, territory or possession of the United States to officially certify hemp seed and that has standards and procedures approved by the United States Secretary of Agriculture to assure the genetic purity and identity of the hemp seed certified. The department will accept varieties that have been approved by state Departments of Agriculture for use in their Hemp growing programs. Varieties listed as prohibited or a variety of concern may **not** be used.

On the grower application, you must provide information concerning the source of your seed/ propagules. You must provide evidence that the seed/ propagules are certified by a state designated

CT.gov lists of approved seeds

Colorado

Count	#	Year CDA Approved	Variety	Breeding Company Distributor	Origin	Flowering
				CREA, the Italian Ministry of Agriculture, Italy		
1	1	2016	<i>Eletta Campana</i>	Schiavi Seeds LLC (Lexington, KY) :	Italy	Dioecious
2	2	2016	<i>Fibranova</i>	Schiavi Seeds LLC (Lexington, KY) :	Italy	Dioecious
				Institute of Field & Vegetable Crops in Novi Sad, Serbia		
3	3	2016	<i>Helena</i>	Schiavi Seeds LLC (Lexington, KY) :	Serbia	Monoecious
				The Polish Institute of Natural Fibers, Poland		
4	4	2017	<i>Beniko</i>	Schiavi Seeds LLC (Lexington, KY) :	Poland	Monoecious
5	5	2017	<i>Tygra</i>	Schiavi Seeds LLC (Lexington, KY) :	Poland	Monoecious
				The Polish Institute of Natural Fibers, Poland		
6	6	2017	<i>Bialobrzeskie</i>	International Hemp Solutions/ Bija Hemp (Denver, CO)	Poland	Monoecious
7	7	2017	<i>Elite</i>	New West Genetics (Ft. Collins, CO): New West Genetics (Ft. Collins, CO):	USA	Dioecious
8	1	2018	<i>B 11</i>	Potent 2018 Ltd (Hotchkiss, CO) Potent 2018 Ltd (Hotchkiss, CO)	USA	Dioecious
9	2	2018	<i>CRS-1</i>	Hemp Genetics International (Canada) Hemp Genetics International (Canada)	Canada	Dioecious
10	3	2018	<i>Henola</i>	The Polish Institute of Natural Fibers, Poland Bija Hemp (Denver, CO)	Poland	Monoecious
11	4	2018	<i>Medicine Mother</i>	Mountain Flower Botanicals (Hotchkiss, CO) Mountain Flower Botanicals (Hotchkiss, CO)	USA	Dioecious
12	5	2018	<i>Rajan</i>	The Polish Institute of Natural Fibers, Poland The Polish Institute of Natural Fibers, Poland	Poland	Monoecious
13	6	2018	<i>VC Star</i>	Grow Hemp Colorado (Boulder, CO) Grow Hemp Colorado (Boulder, CO)	USA	Dioecious



Fiber/grain hemp research from North Dakota and Cornell University

Table 2. Long-term agronomic characteristics of the industrial hemp cultivars selected for the 2016 NDDA Pilot Research Program

Cultivar	Seed Source	Flower Type	Use	Maturity (days)	% Seed Yield* (% of variety CRS-1)
CANDA	Parkland IHG Coop	Monoecious	Grain, fiber	110	86
CFX-1	Hemp Genetics Int.	Dioecious	Grain, fiber	105	106
CRS-1	Hemp Genetics Int.	Dioecious	Grain	110	100
FINOLA	Hemp Oil Canada Inc.	Dioecious	Grain, Oil	100	83% **

Table 5. Delta-9 THC in industrial hemp samples, at seed ripening stage.

Producer	Cultivar	% THC** (dry weight)
LaMOURE	CANDA	.002
	CANDA (2 fields)	.012 + .037
GRANT	CRS-1	.007
	CFX-1	.007
BENSON	CFX-1	.007
	FINOLA	.008
FOSTER	CANDA	.004
	FINOLA	.044

2-4% CBD

Table 2. Fiber, grain, and dual purpose cultivar information.

Entry	Seed Company	Purity	Germ	TSW	Days to Maturity
<i>Fiber Type</i>					
Carmagnola	Schiavi Seeds LLC	0.9905	0.87	16.3	-
Carmagnola Selezionata	Schiavi Seeds LLC	0.9963	0.84	21.6	-
Eletta Campana	Schiavi Seeds LLC	0.9882	0.72	15.6	-
Fibranova	Schiavi Seeds LLC	0.9719	0.47	15.2	-
Futura 75	AssoCanapa	0.9977	0.84	17.9	145
SS Alpha	Sunstrand	0.9685	0.42	16.7	-
Tygra	AssoCanapa	0.9996	0.85	13.9	135
<i>Grain Type</i>					
CFX-1	Hemp Genetics Intl	0.9922	0.71	16.2	105
CFX-2	Hemp Genetics Intl	0.9972	0.9	16.5	103
CRS-1	Hemp Genetics Intl	0.9986	0.88	18.4	110
Grandi	Hemp Genetics Intl	0.9953	0.93	16.5	100-110
Katani	Hemp Genetics Intl	0.9934	0.75	15.6	100-110
Pewter River	Winterfox Farms	0.9929	0.39	22.0	90-120
Piccolo	Hemp Genetics Intl	0.9991	0.97	16.2	100-110
Portugal	Winterfox Farms	0.9946	0.43	15.1	90-110
Swift	Winterfox Farms	0.9905	0.87	11.8	100-120
USO-31	AssoCanapa, UNISeeds	0.9966	0.69	17.4	110
X-59	Legacy Hemp	0.9985	0.94	15.9	100
<i>Dual Type</i>					
Anka	UNISeeds	0.9975	0.87	15.7	110
Bialobrzskie	AssoCanapa, Bija Seeds	0.9994	0.92	14.0	135
Canda	Parkland Industrial Hemp Growers	0.9979	0.93	15.9	100-120
Felina 32	AssoCanapa, Schiavi Seeds	0.9989	0.75	15.8	135
Ferimon	UNISeeds	0.9979	0.91	13.7	125
Futura 75	AssoCanapa	0.9977	0.84	17.9	145
Helena	Schiavi Seeds	0.9996	0.86	12.8	-
Joey	Parkland Industrial Hemp Growers	0.9965	0.86	14.6	100-120
Nebraska Feral	Winterfox Farms	0.9719	0.57	10.7	120
NWG-331	New West Genetics	-	0.95	11.2	-
NWG-Elite	New West Genetics	0.9938	0.89	9.8	-
Rocky Hemp	Winterfox Farms	0.9951	0.29	21.1	120-150
SC-1	PreProcess Inc.	-	-	25.7	-
Sterling Gold	Winterfox Farms	0.9941	0.37	20.5	120-150
Tygra	AssoCanapa	0.9996	0.85	13.9	135
Wojko	AssoCanapa	0.9951	0.54	15.2	135

Table 3. Trial locations, type, and harvest/data collection dates.

Location	Grain	Dual Purpose	Fiber – green	Fiber - retted
Chazy, NY	10/16	10/17	9/12	10/22
Freeville, NY	10/9-10/10 (3 Reps)	10/10, 10/15 (3 Reps)	9/6-9/7	9/28
Geneva, NY (CN)	9/17	9/17	9/4	10/1
Geneva, NY (RS)	Not harvested	9/21, 9/24		
Ithaca, NY (MG)	9/21-10/12 (3 Reps)	10/5-10/12	8/30-8/31	9/24
Riverhead, NY	Not harvested	Not harvested	9/14	10/18



Approved Varieties of Industrial Hemp for Planting
October 15, 2018

The following table includes the approved industrial hemp varieties that may be cultivated, planted, grown, handled, harvested, stored, distributed, transported, or processed in this state in accordance with the Industrial Hemp Research Program administered by the Kansas Department of Agriculture (“KDA”) pursuant to K.S.A. 2018 Supp. 2-3901 *et seq.*, and amendments thereto, and rules and regulations adopted thereunder.

Variety	Variety
Alyssa	Joey
Beniko	Katani
Canda	KCC13
Carmagnola	Martha
CC	Maui’s Cherry
CFX-1	Maui’s Cherry 2
CFX-2	MS77
Cherry Wine	MS77-CHG
Cobbler #8	OT
CRS-1	Otto II: Endurance
Delores	Otto II: Franklin
Eletta Campana	Otto II: Stout
Elite	Picolo
Endurance LF 2/14	PR13
Fedora 17	Santhica 27
Felina 32	Seagull IH 1
Fibrol	Stout LF 2/14
Fibronova	Sweetened LF 2/14
Finola	T1
Franklin LF 2/14	Trump
Futura 75	Tygra
Georgina	USO 31
Grandi	Victoria
H2 Cherry 1-6	Wojko
HK05	Workhorse
HK08	X-59
Helena	Zolotonosha15

Montana

Montana 2019 Hemp Seed/Clone Variety List
Pending Administrative Rules of Montana publication Notice No. 4-19-255

Category A - varieties formally approved by the department.

CFX-1, CFX-2, CRS-1, Canda, Carmagnola, Carmagnola Select, Fedora 17, Grandi, Joey, Katani, Picolo.

Category B - varieties approved by other states or countries at a level equivalent to the departments.

Altair, Alyssa, Angie, Anka, Armanca, Asso, B 11, Beniko, Bialobrzieskie, CS, CanMa, Cannakomp, Carma, Carmen, Carmaleonte, Chameleon, Codimono, CHA, CHY, Crag, Dacia Secuieni, Debbie, Delores, Delta 405, Deltallosa, Denise, Diana, Dioca 88, Deni, ESTA-1, Eco Aglegra, Eco Nebliss, Eletta Campana, Epsilon 68, Elite, Fasamo, Fedrina 74, Felina 32, Felina 34, Ferimon, Fibrol, Fibranova, Fibrante, Fibriko, Fibrimon 24, Fibrimon 56, Finola, Futura 75, Georgina, GranMa, Glectia, Gliana, Helena, Henola, Hiration, IDA-0103, Ivory, Judy, Jutta, KC Bonusz, KC Dora, KC Virtus, KC Zuzana, Kompolti, Kompolti Hibrid TC, Kompolti Sargaszaru, Laura Secord, Lipko, Lovrin 110, Marcell, Marina, Markant, Martha, Medicine Mother, Monoica, Nadine, Novosadska, Petera, Quida, Rajan, Ratza, Santhica 23, Santhica 27, Santhica 70, Secuieni Jubileu, Silesia, Silistrenski, Silvana, Succesiv, Szarvasi, Tiborszallási, Tisza, Tygra, UC-RGM, USO , 4, USO 31, Uniko B, VC Star, Victoria, Villanova, Wojko, X-59 (Hemp Nut), Yvonne, Zenit, Zolotonosha 11, Zolotonosha 15.

Category C - all other hemp varieties that an applicant reasonably believes will not produce a plant with over 0.3% THC at any time prior to harvest and are not in Category D (Category C varieties will require additional sampling and testing at the grower’s expense).

Category D - includes all varieties forbidden by any federal law or regulation or added by rule by the Department because of its inability to consistently produce hemp.

Wisconsin

Approved Hemp CBD Varieties – as of April 26, 2019

The following high CBD varieties of hemp seed/clones have been approved by DATCP to grow in Wisconsin in 2019. **Approval to grow does not guarantee a variety will pass the DATCP pre-harvest regulatory test** as THC levels in high CBD hemp varieties are not stable. **Growers are responsible for monitoring their crops.** **Any field/variety that does not pass the required DATCP pre-harvest regulatory test with a delta-9 Total THC concentration of 0.3% or below will be ordered to be destroyed.** DATCP calculates Total THC as d9-THC + 0.877*THCa and we round down so 0.399 = 0.3%. To seek approval of a high-CBD variety not included on this list please send the name of the variety, the name of the supplier, and a lab analysis of the variety (often referred to as a Certificate of Analysis) to DATCPIndustrialHemp@Wisconsin.gov

A-2	Cherry Cross	Mountain Mango
Abacus	Cherry Hybrid	Murphy's Medley
ACDC Super CBD	Cherry Kandy (Nate Moon)	N9 (Jet Fuel)
Afternoon Delight	Cherry Pie	Northern Remedy
Altitude	Cherry Tres	Northern Spectrum
Awesome Blossom	Cherry Uno	Northern Suzy
Berry Blast	Cherry Wine	NBS CBD 1
Berry Blossom	Cherry x Otto 2 Sweetened	Oregon Cherry or Original Cherry
Boax	Cherub	Otto 1
Boax x Cherry Wine	Coag	Otto 2
Boring 'Ol Hemp Strains 1-4	Cobbler	Otto 2 x AC/DC
Boutique Feminized Strains 1 and 2	Colorado Cherry	Otto 2 x Franklin
Boxwine	Colorado Cherry 5	Palm
Bubblegum	Colorado Gold	Parkdale Boutique Strains 1, 2 and 3
Bubblegum x Otto	CS2	Peacemaker
Canna Tsu	Deschutes	R23, R24, R25, R26, R27
Cannatonic	Early Bird	Relief Now
Cascade	Elektra	Remission
Cascade Bay	Eugenius CBD Blue Genius	Rogue
Cat Lady	Florence	Sisters
Century 7	FRB Early Pearly	Sour Space Candy
CF1	H1	Sour Tsunami
Chardornay	Harley Tsu	Special Sauce
Chardonnay x Cherry Wine	Harley Tsu x Canna Tsu	Stout
Charlotte's wife	Hawaiian Haze	Suver Haze
Cherry	Hemp Star	Sweet Wife
Cherry 1 or c1	Hempress 1, 2, and 3	T1 (Trump)
Cherry 2.0	Highway 77	T2
Cherry 307	Hybrid #9	Trump Midwest Strain
Cherry 308	Invictus	Umpqua
Cherry 5	JH-1	Wife
Cherry x Abacus	Jet Fuel	Wu 5
Cherry x ACDC	Lifter	Youngsim 10
Cherry Blossom	Merlot	Z-1
Cherry Bubblegum	Midwest Strain	Z2
Cherry Cherry	Mojave Cherry Wine	

Oklahoma

Oklahoma Department of Agriculture Food, and Forestry
2800 North Lincoln Boulevard
Oklahoma City, OK 73105-4972
Phone 405-522-5971



Certified Low THC Industrial Hemp Seed List (as of 6/3/2019)

Business Name	Phone	Email	Variety
Back 40 Enterprises	807-726-8046	tribriggs@gmail.com	Special Wine
Blue Forest Farms, LLC	801-633-4804	dj@blueforestfarms.com	Cherry Wine
Botanac, LLC	405-400-9528	tina@botanac.com	Berry Blossom Boax Cherry Wine Yuma Crossbow
Cannetics	843-343-1015	jason@cannetics.co	Cherry Wulf Wulf
Colorado Cultivars USA LLC	970-305-7081	coloradocultivars@gmail.com	C-Horse Work Horse
Davis Farms	971-304-5592	info@davisherbfarms.com	Admiral's Kush Eighty Eight Esmerelda Painted Lady Purple Emperor Skipper
Eco Hemp	405-417-0647	rob@ecohempwholesale.com	Cherry Blossom by
Future Farms	720-454-7280	genomicchemist@gmail.com	BaOx
Fytiko Farms Inc	404-307-4886	paultmannion@gmail.com	BaOx+ Cherry Bubble Gum Cherry Kandy

Kentucky

Kentucky Department of Agriculture
Version KDA-HEMP-2018-0126

Industrial Hemp Research Pilot Program
Varieties of Concern and Prohibited Varieties List

Variety / Strain (alphabetical)	Last Year Grown in Kentucky	KDA Designation	Variety / Strain (alphabetical)	Last Year Grown in Kentucky	KDA Designation
1. Alyssa	2016		34. HK01	2017	Variety of Concern
2. Canda	2017		35. HK02	2017	Variety of Concern
3. Carmagnola	2017		36. HK04	2016	Variety of Concern
4. Carmagnola Select	2017	Variety of Concern	37. HK05	2017	
5. CBDRx Cherry	2017	Variety of Concern	38. HK06	2017	Variety of Concern
6. CC	2017		39. HK07	2017	Variety of Concern
7. CFX-1	2017		40. HK08	2017	
8. CFX-2	2017		41. Hope	2017	Prohibited Variety
9. CHA	2016	Prohibited Variety	42. HS1	2017	Variety of Concern
10. Cherry	2016	Variety of Concern	43. HS2	2017	Variety of Concern
11. Cherry #9	2016	Variety of Concern	44. Joey	2016	
12. Cherry Wine	2017		45. Katani	2017	
13. CHG	2017	Variety of Concern	46. KCC1	2017	Variety of Concern
14. CHY	2017	Variety of Concern	47. KCC2	2017	Variety of Concern
15. Cobbler #8	2017		48. KCC3	2016	Prohibited Variety
16. CRS-1	2017		49. KCC6	2016	Variety of Concern
17. CW1A	2017	Variety of Concern	50. KCC7	2016	Variety of Concern
18. CW2A	2017	Variety of Concern	51. KCC8	2016	Variety of Concern
19. Delores	2017		52. KCC10	2017	Variety of Concern
20. Dion Hemp 4	2017	Prohibited Variety	53. KCC12	2016	Variety of Concern
21. Eletta Campana	2017		54. KCC13	2017	
22. Endurance LF 2/14	2017		55. KGG1	2017	Variety of Concern
23. Fedora 17	2016		56. KY Plume	2017	Variety of Concern
24. Felina 32	2016		57. Martha	2017	
25. Fibrol	2016		58. Maui's Cherry	2017	
26. Fibranova	2017		59. Maui's Cherry 1	2017	Variety of Concern
27. Finola	2017		60. Maui's Cherry 2	2017	
28. Franklin LF 2/14	2017		61. MS77	2017	
29. Futura 75	2017		62. MS77-CHG	2016	
30. Genesis AV1	2016	Prohibited Variety	63. OT	2017	
31. Georgina	2017		64. Otto II: Endurance	2017	
32. Grandi	2017		65. Otto II: Franklin	2017	
33. H2 Cherry 1-6	2017		66. Otto II: Stout	2017	



Kentucky Department of Agriculture
Version KDA-HEMP-2018-0126

Industrial Hemp Research Pilot Program
Varieties of Concern and Prohibited Varieties List

Variety / Strain (alphabetical)	Last Year Grown in Kentucky	KDA Designation	Variety / Strain (alphabetical)	Last Year Grown in Kentucky	KDA Designation
67. Picolo	2017		77. Trump	2017	
68. PR13	2017		78. Tygra	2017	
69. Sam 2	2017	Prohibited Variety	79. USO 31	2017	
70. Santhica 27	2017		80. Victoria	2017	
71. Seagull IH 1	2017		81. Wife	2016	Variety of Concern
72. SS Alpha	2017	Variety of Concern	82. Wojko	2016	
73. Sterling Gold	2016	Variety of Concern	83. Workhorse	2017	
74. Stout LF 2/14	2017		84. X-59	2017	
75. Sweetened LF 2/14	2017		85. Z4	2017	Variety of Concern
76. T1	2017		86. Zolotonosha15	2017	

NOTE: The varieties or strains listed were previously reported to be planned sampled and tested as a part of the KDA Program.

KDA will update this list annually. Variety/strain designations are subject to change.



PO BOX 160
COMINS, MI 48619

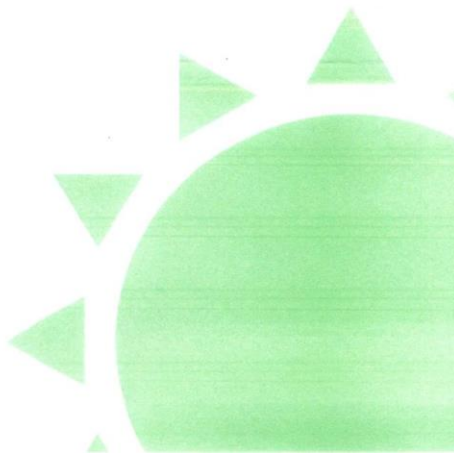
317-903-5109
SCICLONFARMS@GMAIL.COM

This letter certifies that the hemp product contained in this package contains THC levels well below 0.3%

I certify that all information furnished in this letter and supporting documents are accurate, truthful, and complete. I understand that anyone who furnishes false or misleading information or omits information relating to this certification may be subject to criminal and/or civil penalties, including fines and imprisonment.

Eric Troxell

Jill Johnson



Issued On: 5/10/2019
Expires: 11/30/2019

STATE OF MICHIGAN
Department of Agriculture & Rural Development
Pesticide and Plant Pest Management Division

HPHL-000066
HEMP PROCESSOR-HANDLER
LICENSE
Display Prominently

Issued To:
SCICLONE LLC
18755 MCINTIRE RD
COMINS, MI 48619

Responsible Party and Address:

SCICLONE LLC
PO BOX 160
COMINS, MI 48619



Gary McDowell
Director

This license is not transferable and is only valid for the establishment owner and address listed above. This license issued in accordance with provisions of Act 641, of 2018

Issued On: 5/10/2019
Expires: 11/30/2019

STATE OF MICHIGAN
Department of Agriculture & Rural Development
Pesticide and Plant Pest Management Division

HPGL-000065
HEMP GROWER
REGISTRATION
Display Prominently

Issued To:
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18755 MCINTIRE RD
COMINS, MI 48619

Responsible Party and Address:

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COMINS, MI 48619



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Youngsim10 Lot 2017C

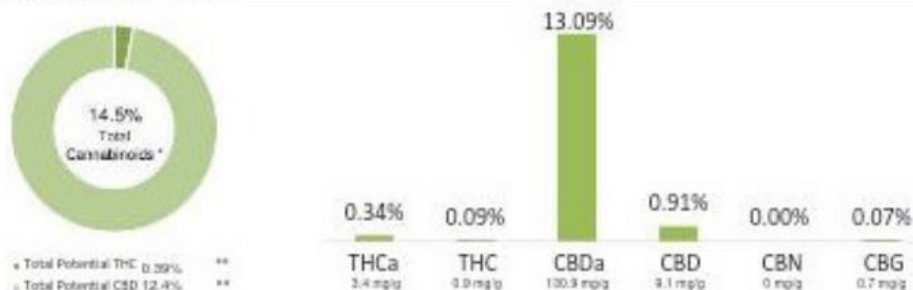
Batch ID: N/A

Reported: 20-Apr-2018

Type: Flower

Test: Potency

CANNABINOID PROFILE



* Total Cannabinoids result reflects the absolute sum of all cannabinoids detected.

** Total Potential THC/CBD is calculated using the following formulas to take into account the loss of a carboxyl group during decarboxylation step:

Total THC = THC + (THCa * 0.877) and Total CBD = CBD + (CBDa * 0.877)

% = % (w/w) = Percent (Weight of Analyte / Weight of Product)

NOTES:

Free from visual mold, mildew, and foreign matter.

FINAL APPROVAL

Mus Yue
Mus Yue
26-Apr-2018
9:21 AM

PREPARED BY / DATE

David Green
David Green
26-Apr-2018
9:33 AM

APPROVED BY / DATE

Testing results are based solely upon the sample submitted to Botanacor Services, LLC, in the condition it was received. Botanacor Services, LLC warrants that all analytical work is conducted professionally in accordance with all applicable standard laboratory practices using validated methods. Data was generated using an unbroken chain of comparison to NIST traceable Reference Standards and Certified Reference Materials. This report may not be reproduced, except in full, without the written approval of Botanacor Services, LLC.



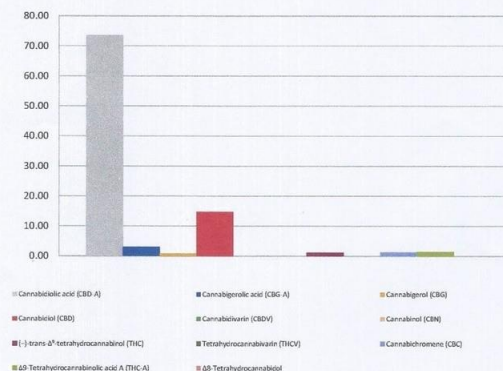
Cannabinoid Profile

Extraction Date(s): 1/15/2019
Analysis Date(s): 1/15/2019

Cannabinoid (HPLC)		Results	
	LOD (mg/g)	Percent	mg/g
Δ8-Tetrahydrocannabinol	<0.1		
Cannabidiolic acid (CBD-A)		7.36%	73.57
Cannabigerolic acid (CBG-A)		0.31%	3.13
Cannabigerol (CBG)		0.06%	0.84
Cannabidiol (CBD)		1.48%	14.83
Cannabidivarin (CBDV)	<0.1		
Cannabinol (CBN)	<0.1		
(-)-trans-Δ ⁹ -tetrahydrocannabinol (THC)		0.12%	1.17
Tetrahydrocannabinol (THCV)	<0.1		
Cannabichromene (CBC)		0.13%	1.25
Δ9-Tetrahydrocannabinolic acid A (THC-A)		0.14%	1.38
Cannabinoids Total		Percent	mg/g
Max Active THC		0.24%	2.38
Max Active CBD		7.94%	79.36
T. Active Cannabinoids		1.81%	18.10
Total Cannabinoids		9.62%	96.18
Ratios			
34.68		:1 CBD to THC	0.03 :1 THC to CBD

pollinated
crop

Cannabinoid (mg/g)



Altitude Consulting, LLC utilizes NIST traceable Reference Standards and Certified Reference Material to calibrate analytical instruments along with proven analytical methods. The methods are applied in the most ethical manner following good laboratory practice guidelines. The results of this report are based solely on the sample submitted and cannot be reproduced.

****Free 15 minute phone consultation with seed purchase (765) 490-0843****

Michigan Growers - orders will be processed after we receive a copy of your license/registration (emailed to sciclonefarms@gmail.com). ALL OTHER STATES - Know and follow your own state's regulations before ordering as we do not assume responsibility for this!
Items ship within 1-2 business days and all sales are final.



Youngsimio 1 Pound
\$1 500.00



Youngsimio "B Grade" 1 Pound
\$500.00



Youngsimio 1/2 Pound
\$900.00



Youngsimio 1 Ounce
\$150.00



Youngsimio 1/4 Pound
\$525.00

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Licenses and Approvals

Colorado Dept of Agriculture

Colorado Dept of Agriculture

Arkansas Dept of Agriculture

Wisconsin Dept of Agriculture

Minnesota Dept of Agriculture

Industrial Hemp Registration # 74890

Farmer Seed Labeler Registration # 0035CA

Seed Dealer/Labeler License #R-520

Approved Varieties: Mountain Mango, Cherry Wine

Annual Seed Permit #20203319